ARIZONA 89 Chino Valley to Forest Boundary Transportation Study

Final Report

April 2017

Prepared for:

ADOT

CYMPO
Central Yavapai Metropolitan Planning Organization

Prepared by:

BURGESS & NIPLE

State Route 89 Chino Valley to Forest Boundary Transportation Study

ADOT Task Assignment MPD 0034-16

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Executive Summary

The State Route 89 (SR 89) Chino Valley to Forest Boundary Transportation Study was conducted by the Arizona Department of Transportation (ADOT) in partnership with Central Yavapai Metropolitan Planning Organization (CYMPO).

SR 89 is a high speed, two-lane roadway located in Yavapai County. SR 89 is a north-south oriented highway that links the City of Prescott (Prescott) and the Town of Prescott Valley (Prescott Valley) to Interstate 40 (I-40) via Chino valley. The Study Area is located along SR 89 from Perkinsville Road (milepost (MP) 328.95) to the Prescott National Forest (PNF) area (MP 341.42). It connects the Town of Chino Valley (Chino Valley), Paulden, and the PNF in Yavapai County.

In the next 25 years, the population of Chino Valley is anticipated to grow by 73% with a 100% increase in employment. This growth is due to general population growth as well as additional commercial and recreational traffic to I-40 and beyond. Many businesses and some residential areas are located along SR 89, where there are numerous access points with limited turning-movement accommodations. Crash data identified 203 crashes from 2010 to 2015 including 62 reported injuries and three fatalities. Rugged terrain, steep grades, and other physical features in northern portion of SR 89 affect traffic flow and reduce the number of passing opportunities. Due to area growth, increasing traffic volumes, limited turning movement accommodations, and high speeds, SR 89 is in need of operational and safety improvements.

This study included stakeholder outreach to inform and obtain meaningful input throughout the study. Stakeholders provided data, reviewed documents, provided guidance, and attended monthly progress meeting via teleconference. The following is a list of study Stakeholders:

- ADOT
- Arizona Game and Fish Department
- Arizona State Land Department
- Town of Chino Valley
- Chino Valley Fire Department
- Chino Valley Police Department
- CYMPO
- Town of Dewey Humboldt
- Department of Public Safety
- The Nature Conservancy
- Paulden Area Committee Organization
- City of Prescott
- Town of Prescott Valley
- United States Forest Service
- United States Fish and Wildlife Service
- Yavapai County

Two working papers were completed in conjunction with this Study: Working Paper 1 – Current and Future Conditions, and Working Paper 2 – Plan of Improvements. Both working papers were reviewed by Stakeholders and recommended improvements presented to the public.

Current and Future Conditions

Working Paper 1 (WP1) summarized completed and ongoing plans and studies impacting the Study Area. Known existing and future conditions within the Study Area were outlined, including:

- Land ownership and jurisdiction;
- Land use;
- Zoning;
- Residential development;
- Activity/employment centers;
- Utilities;
- Transportation network;
- Traffic analysis; and
- Environmental considerations.

Within the past five years, there have been over 200 crashes reported, including three fatalities within the analysis period; an additional fatality occurred immediately following the analysis period. The corridor has two distinct character areas where the crash patterns differ. The following summarizes the findings of the crash analysis:

- South of Road 5N (developed), the top three types of crashes include rear end, left turn, and sideswipe (same direction). Crashes were generally clustered around intersections. The top five locations, from south to north, include the intersections at Perkinsville Road, Palomino Road, Road 3N, Road 4N, and Road 5N. The Perkinsville Road and Road 4N intersections were recently reconstructed as roundabouts, which is anticipated to address safety concerns at these locations. The intersections at Palomino Road, Road 3N, and Road 5N, along with other locations, should be considered for safety related improvements.
- North of Road 5N (less developed), the top three types of crashes include fixed object, rear end, and animal. Crashes were generally clustered around intersections, with various intermittent crash locations throughout. The four fatalities reported in the Study Area occurred in this segment, where three of the four occurred at intersections. In addition to the intersections, clusters of crashes occur just south of the Del Rio Ranch Bridge (near MP 333), between Little Ranch Road and the Big Chino Wash Bridge (MP 335.7 to 336.2), and near the development just south of the BNSF Railway bridge (MP 337.0). In general, there is a need to reduce the number of single vehicle and nighttime collisions.

Provisions for access management for future development should be considered. Primarily south of Road 5N and at spot locations to the north, access point density, location, and type need to be addressed.

Plan of Improvements

Working Paper 2 (WP 2) addressed the primary needs of the corridor identified in WP 1 in light of stakeholder input. These needs included safety and access management improvements that consider environmental concerns, truck traffic, and the potential for growth. A long-term corridor vision, extending beyond the 20-year planning horizon of the study, was developed to accommodate growth and integrate access management. The corridor vision, divided into four segments, should guide improvement along the corridor and accommodate future development as it occurs. Potential improvement strategies were developed that would blend with the long-term vision, minimize "throw away" infrastructure considering the corridor vision, and address the identified needs.

Safety countermeasures were identified that may improve safety performance by focusing on the crash types having the greatest potential for mitigation. The corridor was analyzed by ADOT Traffic Safety Section staff using Safety Analyst and the following recommendations were made:

- Strong need for access management due to high rear-end crashes in urban areas.
- Reduce the high number of run-off road / fixed object crashes in rural areas.
- There is a need for appropriate wildlife fencing.
- Implement wildlife crossing signage (especially between MP 334 – 342).

These recommendations were considered when developing the potential improvements. The safety benefit of the potential improvements was evaluated by using Crash Modification Factors (CMF)s. When combined with probable constructions costs and costs associated with differing crash severities, CMFs provide a basis for cost-benefit analysis.

Ten candidate projects were developed which incorporate various CMFs and enhance access management. The projects were evaluated against the following criteria to determine feasibility and to facilitate prioritization:

- Engineering Features;
- Property Impacts;
- Environmental Compatibility;
- Public Input;
- Safety Impact; and
- Access Management Impact.

Based on the evaluation, projects were prioritized across three horizons: 1) Near-term (5-year), 2) Mid-term (10-year), and 3) Long-term (20-year).

Projects should be implemented based on need, funding opportunities, and other conditions that may change or be unknown at the time this paper was completed. This study serves as the first step in the project development process. The results of this study are preliminary in nature; changes may be necessary as the recommendations advance. The following general steps should be taken to implement the recommendations of this study:

- Finalize the recommendations implementation schedule.
- Incorporate recommendations into existing and future planning documents.
- Complete scoping and final design phases of the project development process. The recommendations illustrated herein are conceptual in nature; formal project scoping will need to be completed, including required typical local, state, and federal agency approvals. Additional research, analysis, coordination, and/or permitting will be required prior to construction. Future design and construction will need to be coordinated with stakeholders and emergency responders.

These recommendations are summarized in ***Table E1***.

Table E1 – Project Recommendations				
Project	**Project Limits (MP)**	**Scope of Work**	**Planning Horizon**	**Estimate of Probable Cost**
P1A – Install Raised Median from Butterfield Road to Road 3N and Retime Signal at Road 3N	329.03 – 329.20	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Butterfield Road to Road 3N. Mill and overlay existing asphaltic concrete pavement; existing curb and gutter to remain. Retime the existing signal at Road 3N with a 100 second cycle for both peaks, with a protected permitted southbound left-turn, protected only northbound left-turn, and permitted only eastbound and westbound left-turns.	Near-term	$490,000
P1B – Install Raised Median from Perkinsville Road to Road 3N with Roundabout at Road 3N	329.00 – 329.20	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Perkinsville Road to Road 3N. Construct a two-lane roundabout at Road 3N.	Long-term	$2,010,000
P2 – Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N	329.20 – 330.20	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 3N to Road 4N roundabout. Construct future roundabout at Road 3 1/2N, funded by private development.	Mid-term	$5,890,000
P3 – Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N	330.20 – 331.28	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase.	Mid-term	$8,370,000
P4 – Align Approaches at Road 6N	332.35	Reconstruct the east and westbound approaches at the Road 6N intersection so that they align (offset approximately 70 feet).	Long-term	$480,000
P5 – Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road	333.41 – 334.50	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.	Long-term	$13,190,000

Table E1 – Project Recommendations				
Project	**Project Limits (MP)**	**Scope of Work**	**Planning Horizon**	**Estimate of Probable Cost**
P6 – Construct Left- and Right-Turn Lanes at Little Ranch Road	335.77	Construct left- and right-turn lanes at Little Ranch Road.	Mid-term	$1,410,000
P7 – Install Lighting at Paulden Post Office	337.05	Install street lighting at the Paulden post office. Cost and CMF assume spot lighting with four poles. Bundling this project with the currently programmed project should be considered.	Near-term	$90,000
P8 – Construct Roundabout at Big Chino Road	337.70	Construct a two-lane roundabout. This project could be bundled with the roundabout at Bramble Drive or constructed sequentially as needed.	Mid-term	$4,540,000
P9 – Construct Roundabout at Bramble Drive	338.80	Construct a two-lane roundabout. This project could be bundled with the roundabout at Big Chino Road or constructed sequentially as needed.	Mid-term	$5,100,000
P10 – Install Wildlife Warning Signage from MP 334 to MP 348	334.00 – 348.00	Install wildlife warning signage from MP 334 to 348.	Near-term	$3,000

1.0 Introduction

The SR 89 Chino Valley to Forest Boundary Transportation Study (Study) is being conducted by ADOT, in partnership with CYMPO.

1.1. Study Overview

SR 89 is a high-speed, north-south oriented highway located in Yavapai County (County). SR 89 is one of a limited number of regional roadways in the CYMPO area that links the City of Prescott (Prescott) and the Town of Prescott Valley (Prescott Valley) to Interstate 40 (I-40) via the Town of Chino Valley (Chino Valley). This Study is focused on the segment of SR 89 that connects Chino Valley, the community of Paulden, and the Prescott National Forest (PNF).

The population in Chino Valley is anticipated to grow 73% over the next 25 years; employment will increase 100%. Traffic volumes along SR 89 and the Chino Valley area are increasing due to general growth as well as additional commercial and recreational traffic to I-40 and beyond. Many businesses and some residential areas abut SR 89, where there are numerous access points with limited turning-movement accommodations.

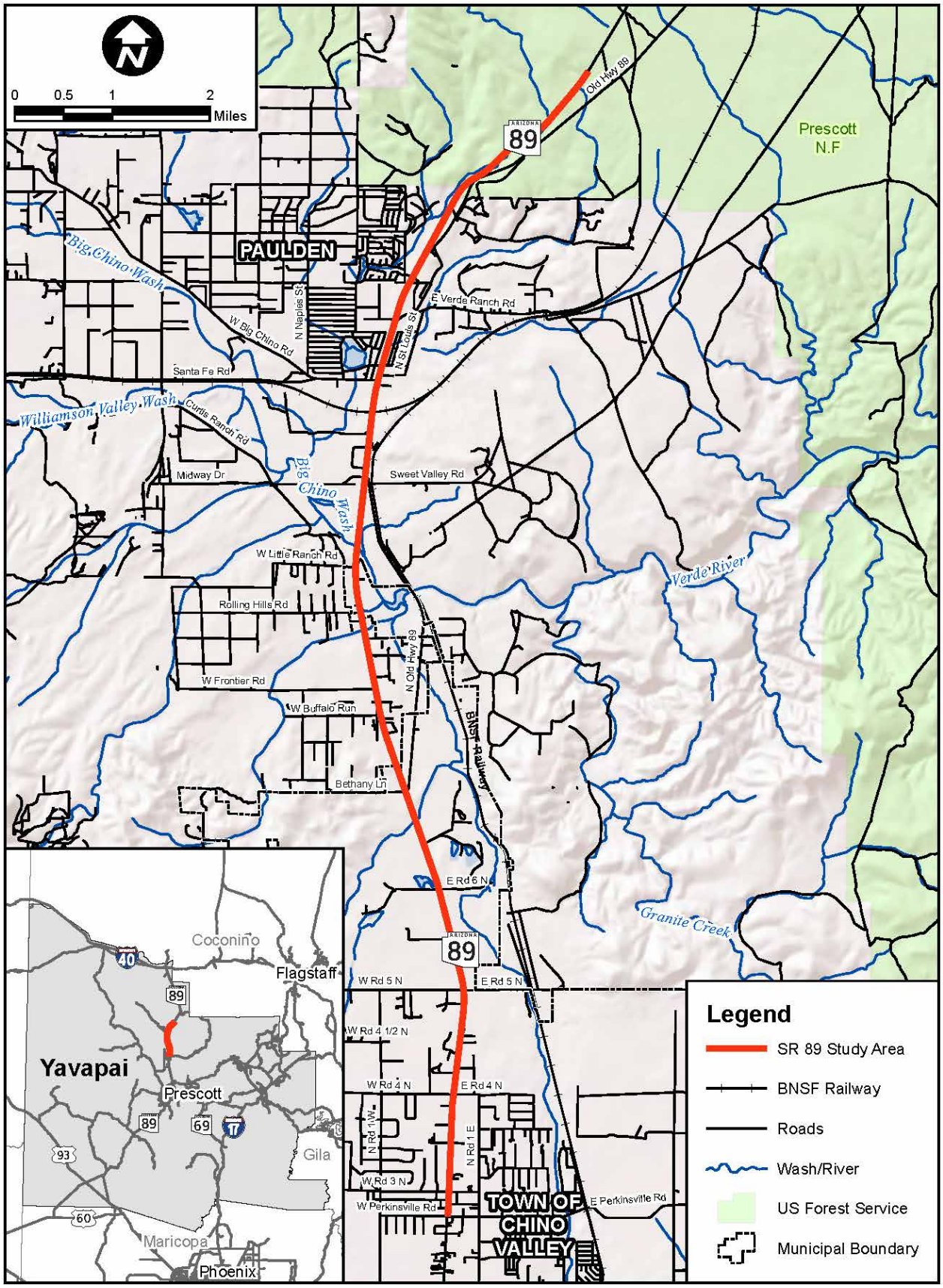
Records identified 203 crashes from 2010 to 2015, where there were 62 reported injuries and three fatalities. North of Chino Valley, rugged terrain, steep grades, and other physical features affect traffic flow and limit passing opportunities. Due to area growth, increasing traffic volumes, inadequate turning-movement accommodations, and high traffic speeds, SR 89 is in need of operational and safety improvements.

The purpose of this Study is to develop a strategic plan to improve the safety and operational efficiency of SR 89. The strategic plan will identify a package of improvements to address safety, access, mobility, and capacity issues. The improvements will be prioritized and prepared for implementation in phases as funding becomes available.

1.2. Study Area

The Study Area consists of the segment of SR 89 from milepost (MP) 328.95 to 341.42 that connects Chino Valley, Paulden, and the PNF in Yavapai County. SR 89 is generally a two-lane roadway, except there are four lanes south of Road 3N. SR 89 is a high-speed facility with a varying posted speed of 55 mph to 65 mph north of Road 5 North; to the south, the posted speed varies 45 mph to 55 mph. A map of the Study Area is included as ***Figure 1***.

Figure 1 – Study Area



2.0 Relevant Plans and Studies

A review of completed plans and studies encompassing the Study Area was performed and summarized below. Sources and reference information for these documents, along with other data included in this working paper, are cataloged in ***Appendix WP1-2***.

2.1. CYMPO Title VI Plan, June 2016

CYMPO recently updated its Title VI Plan, which addresses environmental justice, goals for public involvement, population and demographic profiles of the regions, and provisions for outreach and document translation for limited English proficiency individuals. No protected populations were identified in the Study Area.

2.2. AASHTO U.S. Bicycle Route System, August 2015

The U.S. Bicycle Route (USBR) System is a developing network of bicycle routes aimed at facilitating travel for bicyclists between local streets, communities, and states. Four routes have been recommended in Arizona, including USBR 66, 70, 79, and 90. Alternatives were developed and scored. The recommended route for USBR 79 follows SR 89 from Prescott to I-40.

2.3. CYMPO Regional Transportation Plan Update 2040, April 2015

CYMPO developed the Regional Transportation Plan (RTP) Plan Update 2040 as an update to the 2011 Regional Transportation Plan Update. The communities of Prescott, Prescott Valley, Chino Valley, Dewey-Humboldt, and portions of Yavapai County, and the Yavapai-Prescott Indian Tribe were included. The RTP serves to reprioritize short, medium, and long-term transportation investments through the 2040 planning horizon and adjust performance measures to improve opportunities to obtain federal funding. The RTP indicates widening SR 89 to four lanes south of the Study Area is funded between fiscal year (FY) 2015 and FY2020. Subsequent widening to six lanes from Deep Well Ranch Road to Center Street is included in the FY2025 to FY2040 planning horizon; this segment is also south of the Study Area. The Great Western Extension is included in the FY2025 to FY2040 planning horizon. The Great Western Extension is a new two-lane facility located north of SR 89A and will intersect SR 89 near Road 5 South. Recommended improvements beyond FY2040 include the Chino Valley Extension (see Section 2.8), a new four-lane access controlled road, to serve as an alternate route for SR 89 in the Chino Valley and Paulden areas.

2.4. Statewide Wildlife Crash Analysis and Proposed Action Plan, September 2014

ADOT developed a study assessing wildlife crashes on a statewide basis to address wildlife connectivity and safety. Crash data was obtained from the ADOT crash database and determined the incidence of crashes with wildlife and the proportion of crashes involving wildlife. Highway segments were evaluated in one and five mile increments to identify hotspots. The Plan recommends some type of action for segments with a combined metric of "High" or "Very High." SR 89 scored "high" from MP 340 to 345. Warning signage in both directions is advised.

2.5. Town of Chino Valley General Plan 2014, May 2014

Chino Valley developed its General Plan 2014 to guide long-term planning for the community. The General Plan 2014 identifies existing and future conditions, including land use, transportation, recreation, environment, and planned development. The Chino Valley Vision, established in the General Plan 2014, focuses on expansion and diversification of commercial and residential development while maintaining the town heritage. The General Plan 2014 outlines the goals and strategies of the Chino Valley Vision and serves as a guideline for future decision-making. The General Plan 2014 notes planned improvements along this corridor, including the roundabouts at Road 4N and Perkinsville Road. The General Plan 2014 identifies potential developments, including the Del Rio Springs planned community discussed in Section 3.4.

2.6. 2014 Arizona Strategic Highway Safety Plan, 2014

The Strategic Highway Safety Plan (SHSP), developed by ADOT in coordination with stakeholders, establishes strategies to reduce fatalities and serious injuries on all public roadways. The SHSP serves as the statewide plan, encompassing other state and regional safety plans, to measure the safety performance of public roads based on set goals and objectives. Crash data is analyzed to identify Emphasis Areas that require safety improvements reduce the number of fatalities and serious injuries. The previous Arizona SHSP was adopted in 2007. The SHSP Emphasis Areas should be considered when developing potential improvements to address safety concerns within the Study Area.

2.7. Yavapai County Comprehensive Plan, September 2012

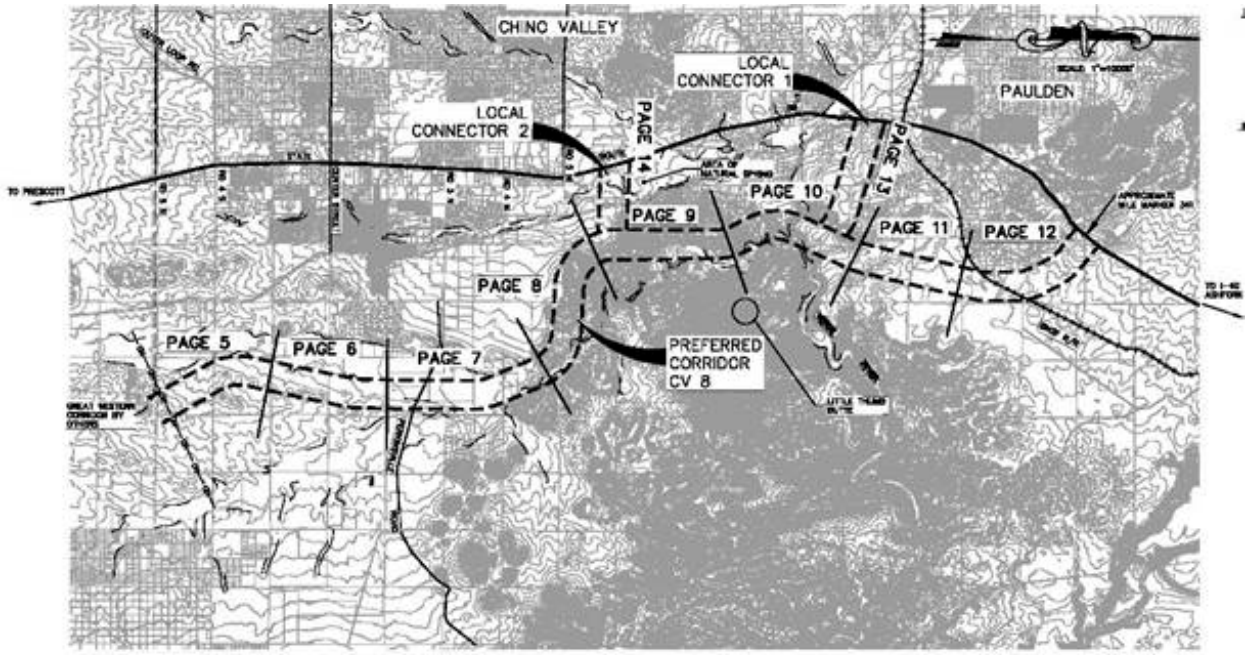
The Yavapai County Comprehensive Plan was developed to guide future development while maintaining the high quality of life and natural environment. Yavapai County includes over 8,000 square miles of land from just north of the Phoenix Metro Area and south of the Grand Canyon. The Comprehensive Plan covers eight elements, including transportation, land use, growth areas, water, energy, open space, environment, and cost of development to guide Yavapai County growth and development. The Comprehensive Plan considers transportation as an essential part of the planning process that guides land use and the compatibility of rural and urban areas. The Comprehensive Plan identifies planned regional roadway projects, including the Great Western/Glassford Extension, which runs adjacent to SR 89 from SR 89A to Road 5S; intersection improvements along SR 89 at Road 4N and Perkinsville Road; and a connection from SR 89 to SR 69.

2.8. Chino Valley Extension Study, February 2009

Chino Valley conducted a corridor feasibility study for the proposed Chino Valley extension, from Chino Valley to north of Paulden. The purpose of the study was to develop alternatives for a corridor east of Chino Valley. Corridor CV8 was the recommended corridor based on the minimal impact to preservation lands and phasing opportunities.

Figure 2 displays the recommended Chino Valley extension as a controlled access highway that serves as an alternative route to SR 89 and SR 89A.

Figure 2 – Recommended Chino Valley Extension



2.9. State Route 89 Access Management Plan, June 1997

This study was unavailable; however, the following excerpt from the *Arizona State Highway Access Policy and Legislation Study*, prepared by Lima and Associates and DMJM Harris in March 2001, summarizes its pertinent recommendations as follows:

> The plan was prepared for ADOT, Yavapai County, City of Prescott, and Town of Prescott Valley and was put together by JHK & Associates in June of 1997. The plan covers a corridor of SR 89 from Prescott north to Paulden and the Prescott National Forest Boundary. Because of the corridors location the access management plan had to address urban, small urban and rural environments in regard to access management. Therefore the plan recommends various strategies for different areas along the corridor, which was divided into six segments. For each of the segments recommendations were made based on the individual segment characteristics. In more detail the following recommendations are made.
>
> Through the Prescott area, south of Granite Dells, the plan identifies four potential locations for future traffic signals. These are spaced approximately 1/2 mile apart. Through Granite Dells, where numerous driveway accesses exist, the plan recommends consolidation of driveways when the land uses change or roadway improvements are performed.
>
> One-half mile spacing between signalized intersections is recommended for the Prescott Airport area, and a list of three potential locations is provided. Between the Airport to Chino Valley, the plan recommends adhering to one-mile spacing of major, signalized intersections and non-major intersections with right-in, right-out, and left-in access at half mile spacing.

Chino Valley is a much more urbanized area with over 200 existing driveways with direct access to SR 89. Therefore, the plan recommends eliminating as many driveways as possible by providing alternate access via town streets and driveway consolidation. The ultimate goal through Chino Valley is major, signalized intersections at one-half mile spacing and non-major intersections with right-in, right-out, and left-in access at one quarter-mile spacing. From Chino Valley to Paulden and the Prescott National Forest boundary, the plan calls for major, signalized intersections to be located at least one-mile apart, and existing access should be consolidated or eliminated when possible.

This study summarizes the recommendations for the SR 89 corridor as shown in ***Table 1.***

Table 1 – Summary of SR 89 Access Management Recommendations	
Intersection Spacing	Rural: 1 mile Urban: 1/2 to 1 miles
Alternative Access	Consolidation of driveways; Alternative access;
Method of Access Management	Eliminate driveways if possible

3.0 Current Conditions

3.1. Land Ownership and Jurisdiction

The entire corridor lies within Yavapai County. The southern portion of the corridor is in Chino Valley and the northern portion is part of the Prescott National Forest, as illustrated in ***Appendix WP1-1.*** Land along the corridor is generally privately owned, although there are pockets of land held by the Arizona State Land Department (ASLD). The Arizona Game and Fish Department (AGFD) has holdings near the corridor, but does not own land immediately adjacent. The corridor passes through both the CYMPO and Northern Arizona Council of Governments (NACOG) planning areas; this boundary follows the PNF boundary, with CYMPO to the south. Land ownership and jurisdiction are shown in ***Figure 3***.

3.2. Land Use

Land use within the corridor is rural in nature. Local commercial uses are concentrated south of Road 5N, with predominately undeveloped, rural residential, and the PNF in the northern portion of the corridor, as shown in ***Figure 4***. The Drake Cement Plant is roughly five miles north of the Study Area, but is a large commercial facility. Residential development is reviewed in more detail in ***Section 3.4.***

Figure 3 – Land Ownership and Jurisdiction

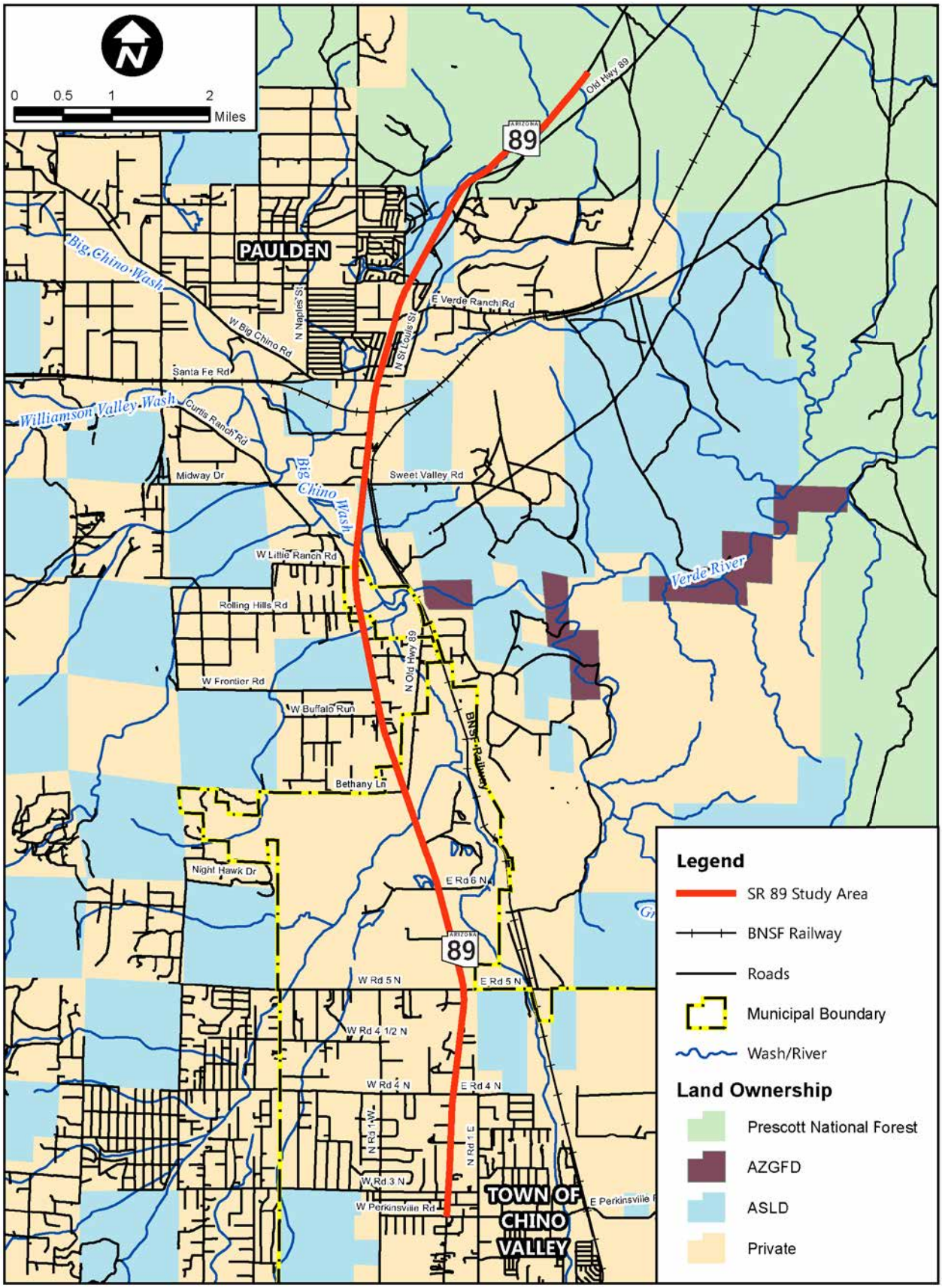
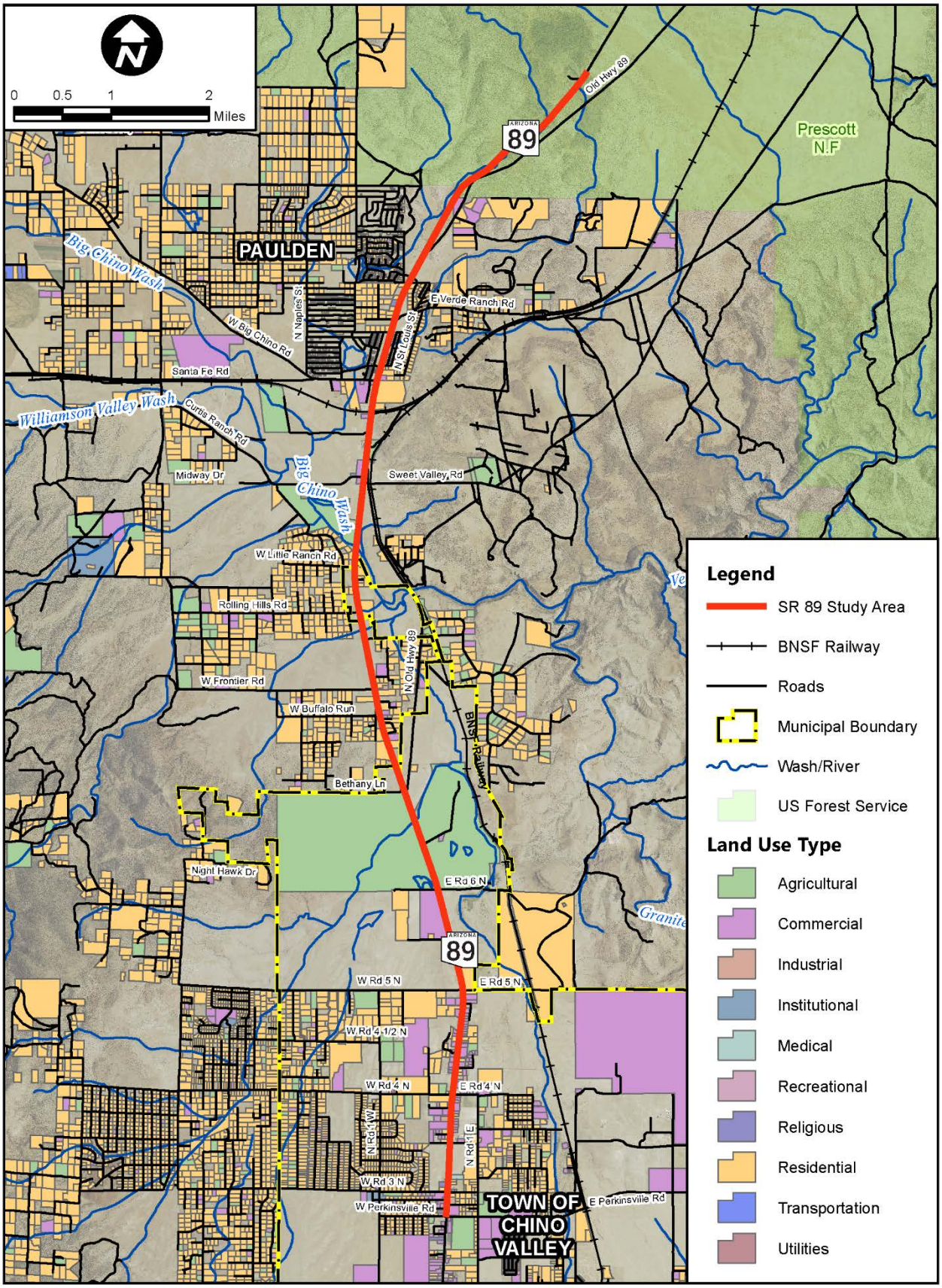


Figure 4 – Land Use



3.3. Zoning

The Study Area includes portions of both Yavapai County and Chino Valley; accordingly, both agencies zoning designations are used within their respective jurisdictions.

The Yavapai County designations shown in ***Figure 5*** include:

- R1L – Residential; Single Family Limited
- RMM – Residential; Multi-Sectional Manufactured Homes
- R1 – Residential; Single Family
- RCU – Residential; Rural
- RS – Residential and Services
- C1 – Commercial; Neighborhood Sales and Services
- C2 – Commercial; General Sales and Services
- PAD – Planned Area Development

There is a 29 acre PAD near Sweet Valley Road that includes the Depot 89 and a mobile home vendor. There are two small commercial parcels between the BNSF Railway and Big Chino Road (approximately 20 and 5 acres each); otherwise, the entire portion of the corridor within County jurisdiction is zoned for varying density residential uses. The vast majority of the corridor is zoned RCU, or Residential; Rural.

Chino Valley designations shown include:

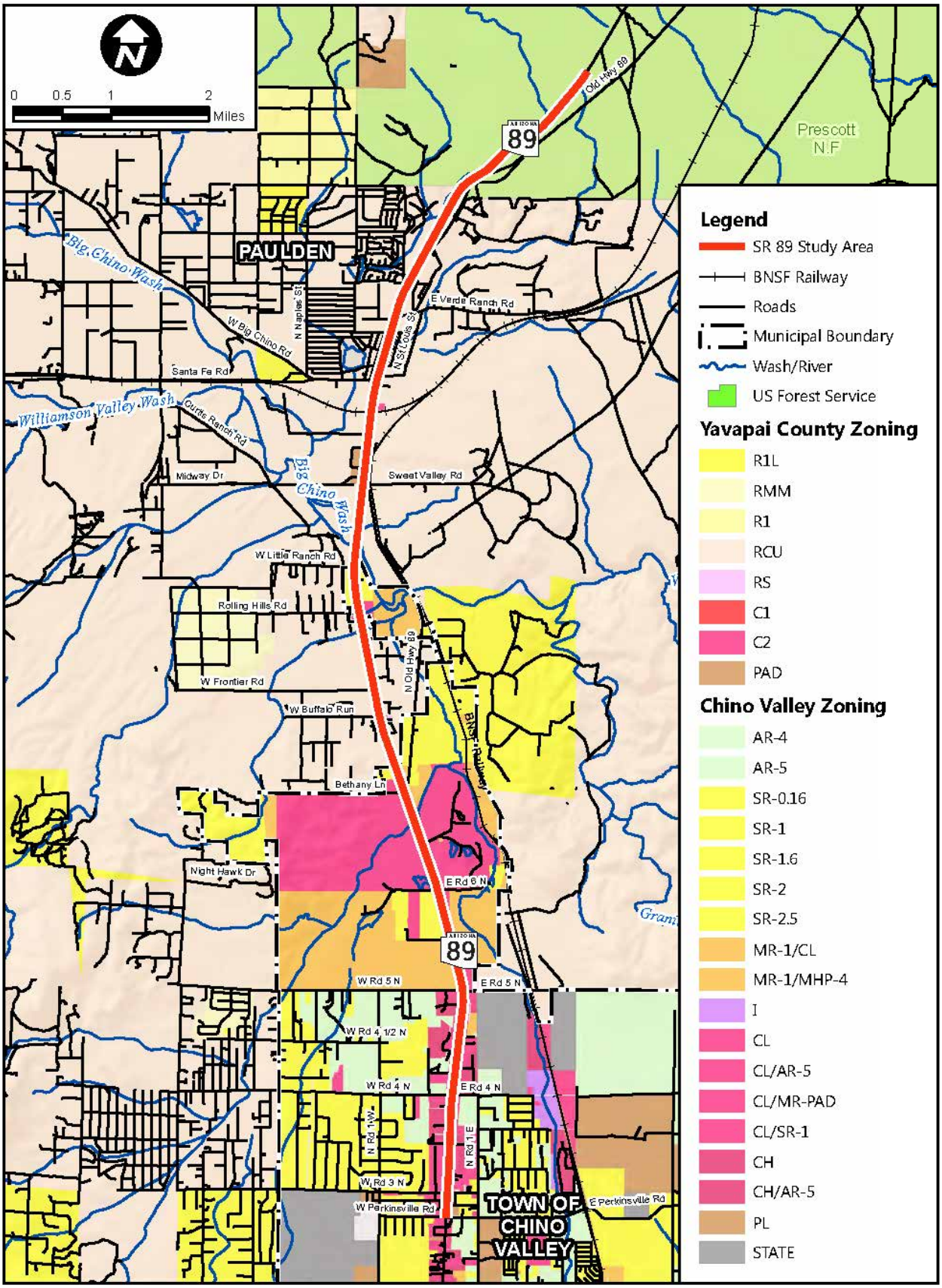
- OS – Open Space/Resource Conservation
- AR-36 – Agricultural/Residential – 36 Acre Minimum
- AR-5 – Agricultural/Residential – 5 Acre Minimum
- AR-4 – Agricultural/Residential – 4 Acre Minimum
- SR-2.5 – Single Family Residential – 2.5 Acre Minimum
- SR-2 – Single Family Residential – 2 Acre Minimum
- SR-1.6 – Single Family Residential – 1.6 Acre Minimum
- SR-1 – Single Family Residential – 1 Acre Minimum
- SR-0.16 – Single Family Residential – 7,000 Square Foot Minimum lot area
- MR – Multiple Family Residential
- MHP-4 - Mobile/Manufactured home parks (4 Acre Minimum)
- CL – Commercial Light
- CH – Commercial Heavy
- I – Industrial
- PL – Public Land Designation

Zoning along SR 89 within Chino Valley is predominantly for commercial use; however, much of the land north of Road 5N is undeveloped or underdeveloped. Large parcels of land between Road 6N and Bethany Lane are held by the Ranch at Del Rio Springs developers and are zoned CL. Otherwise, varying density residential uses are generally zoned where there is no frontage to SR 89.

3.3.1. Open Zoning Cases

Based upon available County and Chino Valley GIS information, along with input from their staff, there are no major open zoning cases along the corridor.

Figure 5 – Zoning



3.4. Residential Development

The Chino Valley Unified Development Ordinance dictates that preliminary plats expire after three years if the application for the final plat is not submitted; it also states that engineering plans are subject to update if construction has not started one year after approval. Plans are also subject to update if construction is stopped for one year or more. These requirements were not in prior versions of the ordinance, so there are approved plats that are not recorded.

The largest development proposed within the Study Area is the Ranch at Del Rio Springs, a 3,000 acre PAD originally expected to provide 1,226 single-family homes. The development was planned north of Road 5N, headed north toward Old Highway 89 on both the east and west sides of SR 89. The development was initiated in 2000 and zoning reflects commercial and MR1/MHP4 residential. The development is currently inactive; the following summarizes its recent history:

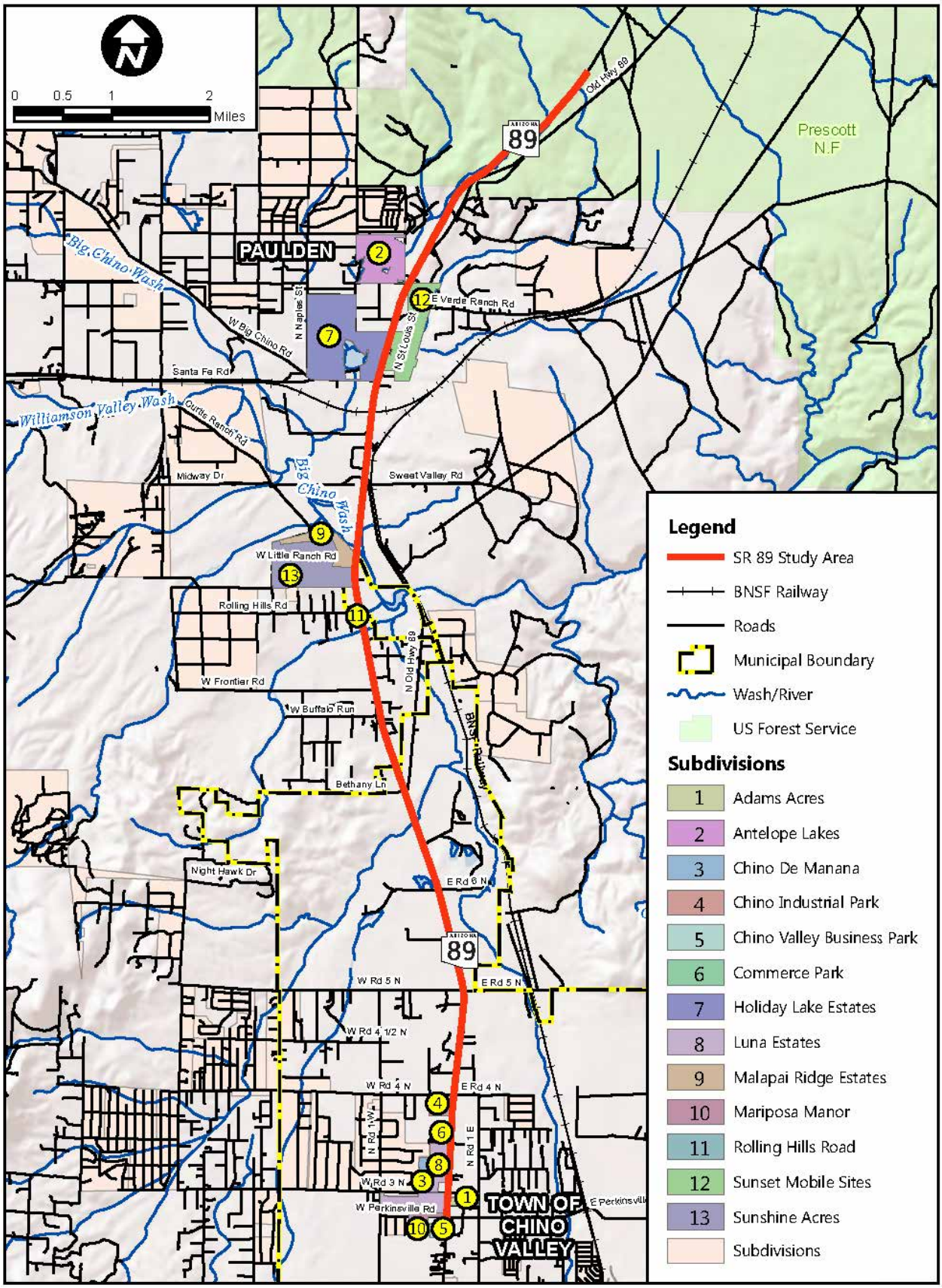
- On September 5, 2000, Council adopted Ordinance Nos. 421 and 432 providing for annexation and rezoning of the subject area.
- On October 26, 2000, Council adopted Ordinance No. 575 approving a Development Agreement with the Ranch at Del Rio Springs.
- On May 26, 2005, Council approved a Final Master Development Plan and adopted Ordinance No. 05-746 approving a First Addendum to the Development Agreement.
- The Citizen Participation protocol resulted in approximately 70 notices being mailed out. The Town received 22 responses in favor, with 20 of those being from Bond Ranch, and one from ADOT stating that: 1) Access points had not been approved and 2) A traffic impact analysis had not been received.
- The Preliminary Plat for Del Rio East – Alpha (Phase I) was approved by the Planning and Zoning Commission with eight stipulations in July 2007. Phase I included 292.2 acres east of SR 89, generally between Road 5 North and Old Highway 89, and provided 163 residential lots (parcels 306-40-038A, 028P and portions of 306-40-038 and 028Q).
- The terms of the Water Resources, Infrastructure, and Management Agreement between Chino Valley and the Ranch at Del Rio Springs ("Agreement") were to expire on February 18, 2008.
- An eighth amendment to the Agreement extended the terms by nine months (December 26, 2008).

No other records were found and a final plat was not submitted.

Approved developments are shown in ***Figure 6.*** There are no active developments planned along SR 89. Developments near the corridor include:

- **Heritage Pointe** – Parcel 306-13-004H has an approved plat for 75 single family homes (1 acre lots). The development is currently in escrow.
- **Windmill House** (name uncertain) – Parcel 306-05-031N recently approved Planned Area Development (PAD) for 105 apartments.
- **Unnamed Development** – Parcel 306-04-006H was platted for 75 units and has been inactive for over one year.

Figure 6 – Residential Development



3.5. Activity/Employment Centers

There are no major employers within the corridor; it primarily serves as a north-south connection to other areas. The Drake Cement Plant is the nearest notable employer, located roughly five miles north of the Study Area.

3.6. Utilities

Existing utilities in the area include Arizona Public Service (APS), Abra Water Company, Cable One, and UniSource Energy. APS has a 69 kV transmission line that parallels SR 89 and crosses from the east to the west side of the roadway in more than one location, as shown in ***Appendix WP1-1***. Other minor utilities are present to serve local needs.

3.7. Transportation Network

3.7.1. Roadway Characteristics

SR 89 is generally a two-lane roadway, except for in the immediate vicinity of the roundabouts at the Road 3 North and Road 4 North intersections. SR 89 is a high-speed facility with a varying posted speed of 55 mph to 65 mph north of Road 5 North; to the south, the posted speed varies 45 mph to 55 mph. SR 89 generally intersects with other public streets at 0.5 mile intervals. Between intersections, there are private access points. Crossing streets of note include Perkinsville Road, Road 3N, Road 4N, and Big Chino Road.

Turn lanes are provided along SR 89 at Rolling Hills Road (northbound left), Midway Drive/Old Highway 89 (northbound left, southbound left), Big Chino Road (northbound left, southbound right), and Bramble Drive/San Francisco Street (northbound left and right, southbound left and right). While no passing lanes are present within the project limits, passing is permitted for at least one direction for approximately 70% of the study area.

The cross section of SR 89 generally consists of a 12-foot lane in each direction and paved shoulders varying between six to ten-feet in width. Curb and gutter replaces the paved shoulders intermittently within the limits of Chino Valley. Beyond the roadway, there are generally recoverable slopes and shallow ditches. There are sections where the road passes through rock cut, including immediately south of the SR 89 intersection with Bethany Lane/Old Highway 89, from the SR 89 intersection with Buffalo Run Road to the SR 89 intersection with Frontier Road, immediately north of the SR 89 intersection with Little Ranch Road, and at approximately MP 340. From MP 340 to the northern end of the Study Area, the roadside grading features a non-recoverable fill slope. From MP 340 to the northern Study Area limits, there are short sections of guardrail in the immediate vicinity of structures or culverts.

The elevation of the roadway through the project limits varies between approximately 4,350 feet and 4,650 feet. The low point is near MP 336. Roadway profile grades are generally less than 3%. Along the corridor, there are spot locations where the profile grade exceeds 3%, but is still less than or equal to 6%. As SR 89 enters the PNF, the profile grade increases to approximately 8%.

There are several structures, both bridges and culverts, along SR 89 within the Study Area. The most notable structure is the grade-separated BNSF Railway crossing approximately 0.3 miles south of the Big Chino Road intersection (MP 337.38) shown in ***Figure 7***. The single-span structure has abutment type walls and creates a pinch point along SR 89; the opening width is approximately 40 feet. This structure complicates roadway widening at this location. According to the ADOT Railroad Liaison, a single track crosses SR 89 and carries roughly nine trains a day. It is not known if there are plans for future expansion or if there are any cargo size limitations.

Figure 7 – BNSF Railway Overpass

SR 89 passes over two structures and three culverts. The structures are at MP 333.09 (Del Rio Ranch Bridge) and 335.95 (Big Chino Wash Bridge). The culverts are at MP 334.1, 335.12, and 337.6.

3.7.1.1. Roadway and Structure Condition

Roadway

The roadway pavement condition along SR 89 has been evaluated by ADOT in multiple categories including cracking, patching, flushing, friction, ride, and rutting. Reporting is provided in mile segments.

Cracking ratings are represented as a percentage with 0% corresponding to no discernable cracking and 100% as pervasive cracking. The average 2013, 2014 and 2015 scores within the project area are 4.7%, 5.6%, and 6.9%, respectively. MP 331 and 338 have had the most cracking, with MP 331 having the worst rating over the three-year period in 2015 with a rating of 20%.

Patching ratings are represented as a percentage with 0% corresponding to no discernable patching and 100% as pervasive patching. The only locations with non-zero patching ratings are MP 333 and 336; MP 333 had a rating of 65% in 2014 and 2015 while MP 336 had a rating of 99% in 2014 and 2015.

Flushed pavement has a shiny surface caused by the liquid asphalt separating from the aggregate and moving upward to the surface of the road. The presence of flushing can be indicative of a pavement which has a wearing surface with reduced surface texture. Flushing ratings are one to five, with a rating of five representing the ideal of no discernable flushing. The average flushing rating in 2015 was four. The lowest rated locations were MP 333 and MP 335, both with ratings of 3.5.

Friction ratings are calculated by multiplying the friction coefficient by 100. Friction ratings above 35 are ideal. Every milepost scored above 35 in 2014 (the last year data was available).

Ride ratings are in inches per mile, with lower values indicating a smoother ride. The average ride rating in 2015 was 60.5 with a minimum value of 48 and a maximum value of 77. The worst rated location is MP 341.

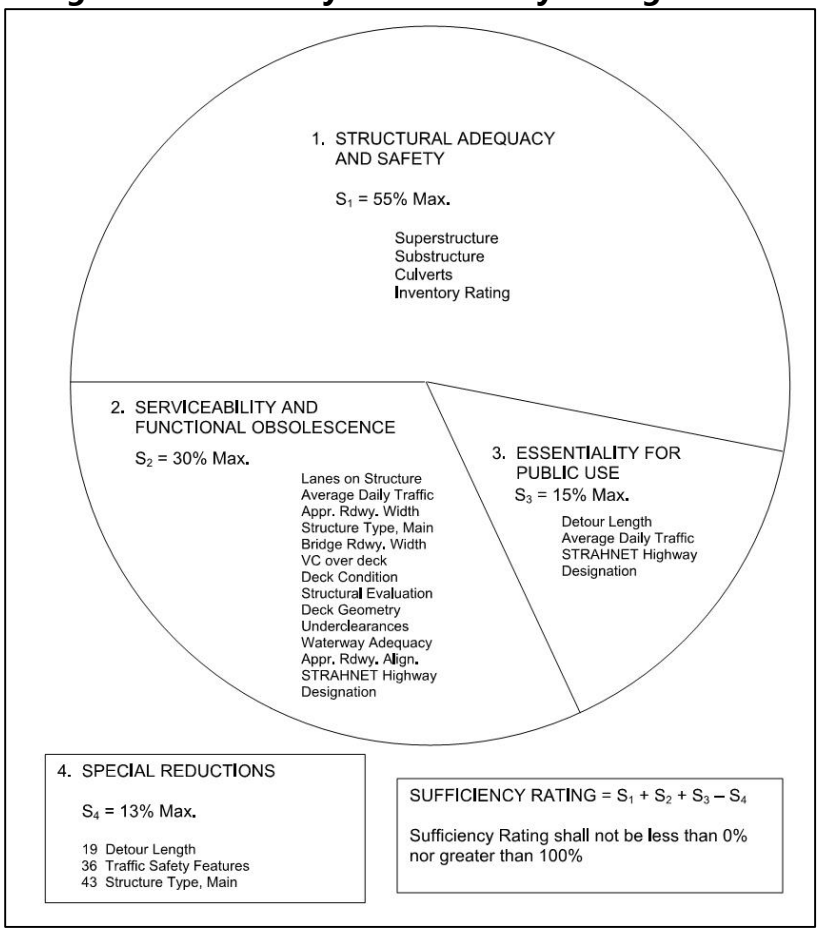
Rutting ratings are provided in inches with lower values indicating less rutting. The average rutting rating in 2015 was 0.06 with a minimum value of 0.02 and a maximum value of 0.11. The worst rated location is MP 336.

MP 336 frequently rates worse than the corridor average and has the corridor-worst ratings in patching and rutting.

Structures

Bridges are given a Sufficiency Rating after being evaluated on the condition of the deck, superstructure, substructure, channel, and culvert. The formula to calculate the Sufficiency Rating is determined by the Federal Highway Administration (FHWA) to assess the following attributes of the bridge: Structural Adequacy and Safety, Serviceability and Functional Obsolescence, and Essentiality for Public Use. ***Figure 8*** depicts a summary of the Sufficiency Rating factors and their relative weights.

Figure 8 – Summary of Sufficiency Rating Factors



ADOT has determined that a Sufficiency Rating of 82 or less triggers the generation of an estimate to determine the costs for needed improvements.

The Del Rio Ranch Bridge (Structure Number 04 20046) was constructed in 2013 and has had no major reconstruction. On its most recent ADOT inspection in 2015, the Del Rio Ranch Bridge scored a Sufficiency Rating of 100.00.

The Big Chino Wash Bridge (Structure Number 04 0979) was constructed 1967 and was partially reconstructed in 2014. On its most recent ADOT inspection in 2015, the Big Chino Wash Bridge scored a Sufficiency Rating of 82.20.

The BNSF Railway overpass (Structure Number 04 1577; MP 337.38), which was constructed in 1961, was inspected in 2015. The ADOT inspection report did not provide a Sufficiency Rating.

The three culverts at MPs 334.1 (Structure Number 4804), 335.12 (Structure Number 4805) and 337.6 (Structure Number 4806) were all inspected by ADOT in 2013 and received identical Sufficiency Ratings of 82.15.

3.7.1.2. Functional Classification of Roads

SR 89 is classified by ADOT as a principal arterial between Prescott and the PNF. Within the limits of Chino Valley, the classification is modified to a Rural Minor Arterial north of Road 4N and an Urban Minor Arterial south of Road 4N.

Crossing streets of note include urban collectors Perkinsville Road, Road 3N, and Road 4N, and minor collector Big Chino Road. Detailed functional classification mapping is shown in ***Figure 9 and Figure 10.***

Figure 9 – Yavapai County Functionally Classified Roads

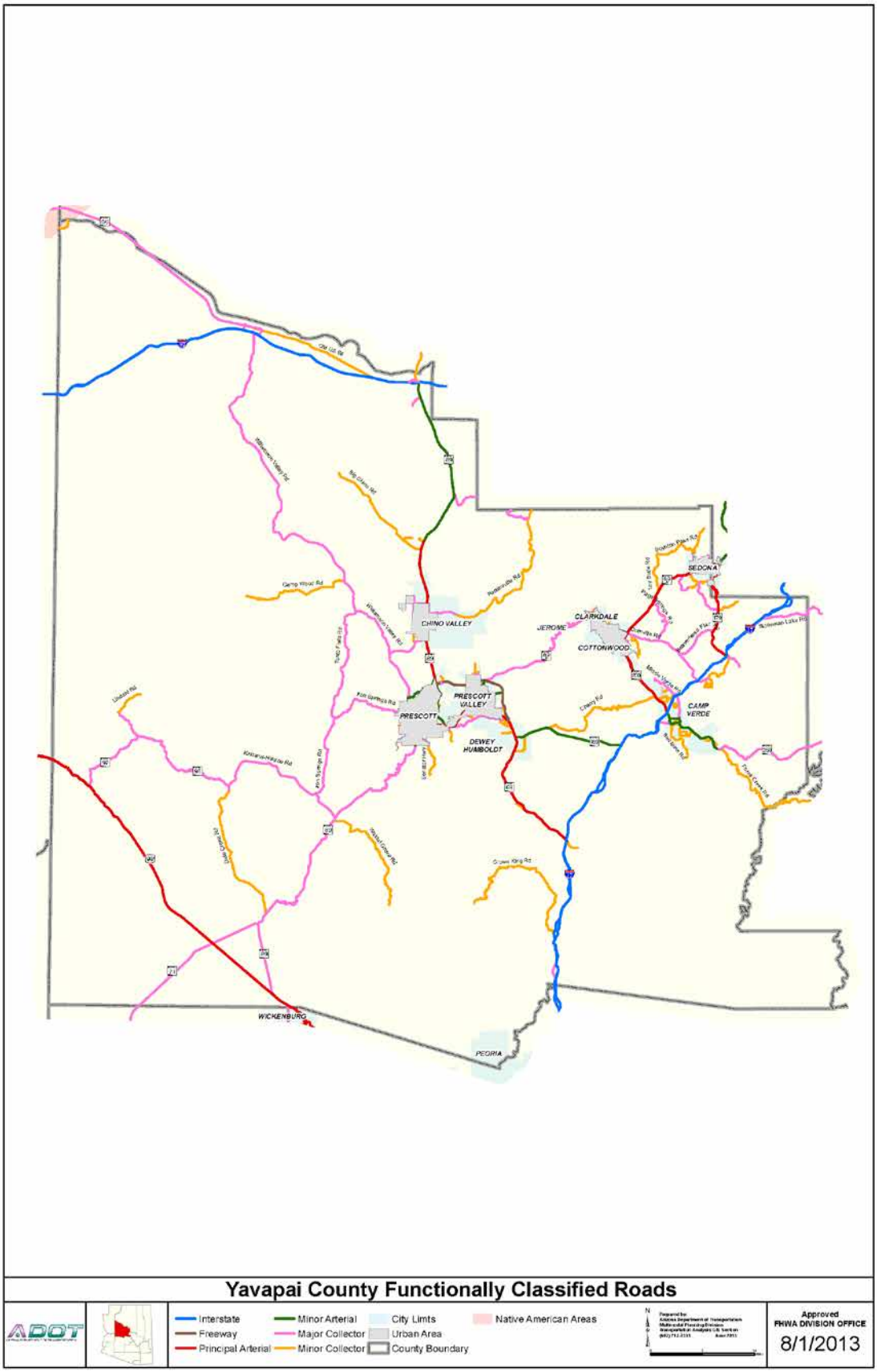
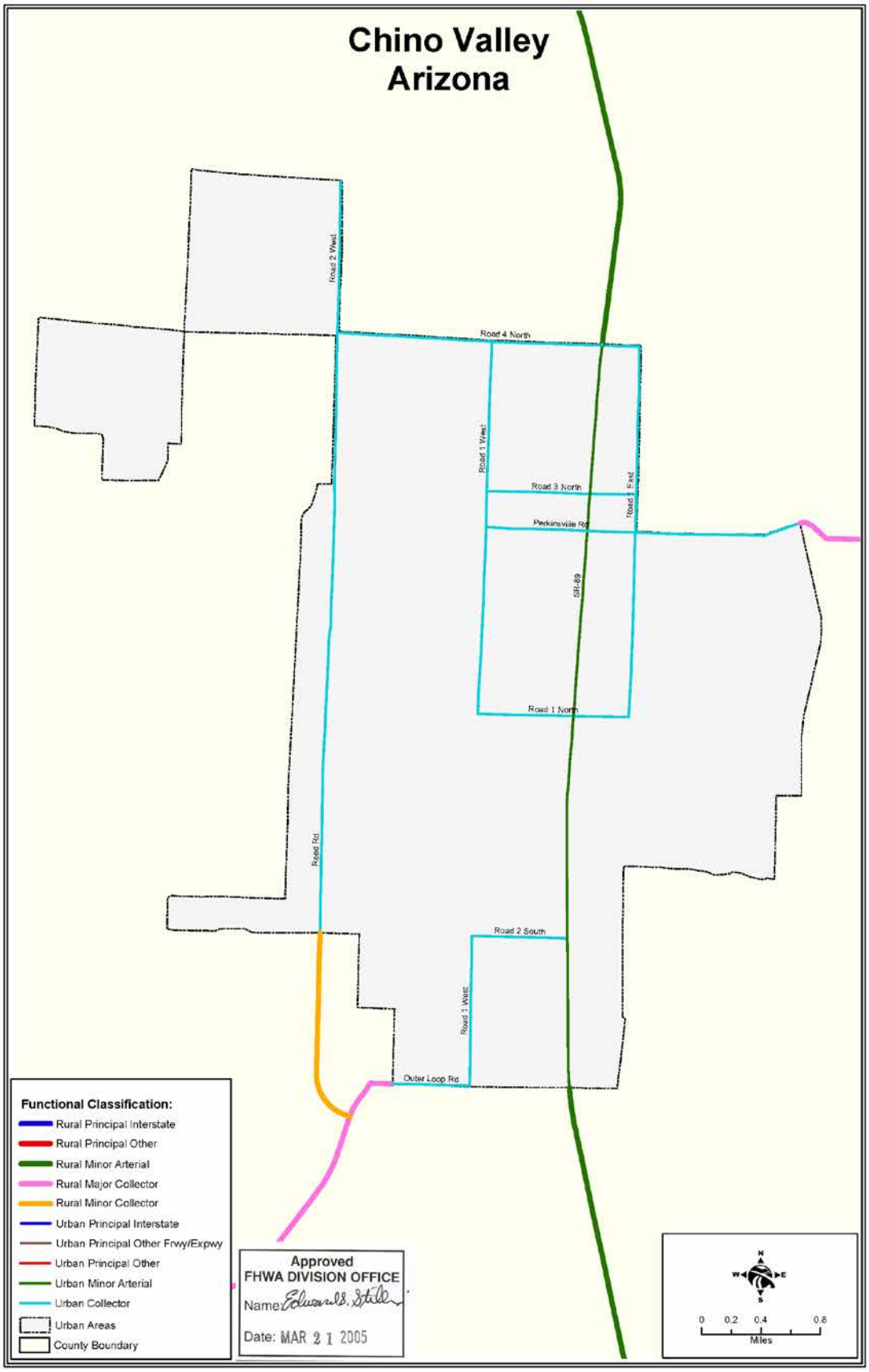


Figure 10 – Chino Valley Functionally Classified Roads



3.7.1.3. Access Management Policies and Guidelines

Access management is the careful control of the location, spacing, design, and operation of public intersections, private driveways, medians and median openings to a roadway. It involves roadway design applications such as median treatments, auxiliary turn lanes and the appropriate spacing of traffic signals. The contemporary practice of access management extends the concept of access design and location control to all roadways – not just limited access highways or freeways. Access management is particularly important along major arterial streets and other principal roads whose primary function is the safe and efficient movement of traffic. The overall benefits of access management include improved roadway operation and safety, preserves market area for businesses, and maintains more efficient freight movement.

Table 2 and ***Table 3*** summarize pertinent draft ADOT Access Management Guidelines used to assess corridor access spacing. ADOT recommendations in ***Table 2*** were applied to note locations where access points are not adequately spaced on the same side of the roadway in ***Appendix WP1-1***.

Table 2 – ADOT Access Management Guidelines Table 4.1 Connection Spacing Requirements

TABLE 4.1 Connection Spacing Requirements

(See Section 4.3.3 for Corner Clearance Connection Spacing Requirements)

Connection Type	Minimum Required Spacing without Median			Minimum Required Spacing with Median	
	≤ 45 mph		> 45 mph	≤ 45 mph	> 45 mph
	2-lane rural *	All other			
Driveways	250 ft	440 ft	660 ft	440 ft	660 ft
Intersections (unsignalized)	250 ft	660 ft	1,320 ft	1,320 ft	1,320 ft
Intersections (signalized)	1,320 ft	1,320 ft	2,640 ft	1,320 ft	2,640 ft

* Minimum spacing criteria only applies to two-lane rural roads exhibiting ALL of the following characteristics:

1. Outside of Metropolitan Planning Organization (MPO) boundaries*
2. Current ADT levels < 2,000
3. Peak hour trip generation potential of the proposed development < 50 total peak hour trips

Though permissible by the guidelines in ***Table 2***, ADOT District staff have indicated ¼ mile signal spacing in this corridor would create traffic signal coordination challenges and should not be allowed.

Table 3 – ADOT recommended Corner Clearance –without Median

Connection Type	Minimum Required Corner Clearance WITHOUT MEDIAN		
	≤ 45 mph		> 45 mph
	2-lane rural *	All other	
Right-In (upstream only)	125 ft	250 ft	440 ft
Right-Out (downstream only)	125 ft	250 ft	660 ft
Right-In/Right-Out	250 ft	275 ft	660 ft
Full Access (unsignalized)	250 ft	660 ft	1,320 ft
Full Access (signalized)	1,320 ft	1,320 ft	2,640 ft

* Minimum spacing criteria only applies to **2-LANE RURAL** roads exhibiting ALL of the following characteristics:
1. Current ADT levels < 2,000
2. Peak hour trip generation potential of the proposed development < 50 total peak hour trips

Note: It is desirable to maximize the distance between the corner parcel connection and the adjacent intersection. Minimum connection spacing criteria for corner clearance should only be considered when greater spacing cannot be achieved.

The draft ADOT Access Management Guidelines also include recommended spacing for corner clearance where a median is present. This guidance was not needed at this time for the corridor, but is included for reference in ***Table 4***.

Table 4 – ADOT recommended Corner Clearance – with Median

Connection Type	Minimum* Required Corner Clearance WITH MEDIAN		
	≤ 45 mph		> 45 mph
	Urban	All other	
Right-In (upstream only)	125 ft	250 ft	440 ft
Right-Out (downstream only)	125 ft	250 ft	660 ft
Right-In/Right-Out	250 ft	275 ft	660 ft
Full Access (unsignalized)	660 ft	1,320 ft	1,320 ft
Full Access (signalized)	1,320 ft	2,640 ft	2,640 ft

1. Minimum connection spacing criteria for corner clearance should only be considered when greater spacing cannot be achieved.
2. Minimum spacing criteria only applies to roads in MPO areas (see Appendix) with high density traffic conditions.
3. It is desirable to maximize the distance between the corner parcel connection and adjacent intersections

The Transportation Research Board's (TRB) *Access Management Manual* (2014) generally recommends that driveway spacing requirements be included as part of "connection spacing" criteria, so that all connections are reviewed concurrently. TRB guidance recommends review of access spacing on opposite sides of a roadway, with different criteria for situations with and without a median.

The National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide (2nd Edition), provides recommendations for access management and roundabouts. It generally directs that driveways not be given direct access to a roundabout, and describes criteria that should be met if direct access is given. It includes general guidance for left-turn lanes downstream from the roundabout. ADOT or TRB guidance for corner clearance at traffic signals should be applied to roundabouts to promote safety and preclude driveways from interfering with intersection operation.

3.7.1.4. Existing Access Control

Appendix WP1-1 provides a comprehensive assessment of the existing access management conditions in the Study Area. Each access point along the corridor was identified through reviewing available aerial mapping and performing site visits in early 2016. Each access point was then categorized into one of the following three access types:

1. RIRO – Only two traffic movements, right-in and right-out, are permitted with a side street or driveway. Intersections are typically controlled by either STOP or YIELD signs on the side street; driveways typically are not signed.
2. Three-Quarter Intersections – Three-quarter intersections provide RIRO and left-in access only and are generally controlled by either STOP or YIELD signs.
3. Full Access Intersection – Full access intersections generally allow all traffic movements on all approaches. These intersections are either STOP controlled on both side street approaches or traffic signal controlled.

Each access point is identified in ***Appendix WP1-1*** and detailed in tabular form in ***Table 5 and Table 6.*** Privately owned roads intersecting SR 89 are denoted in ***Table 5;*** all of the driveways in ***Table 6*** are privately owned and are presented in the order in which they appear heading north in the corridor to facilitate review with ***Appendix WP1-1***. Access spacing was compared to the draft ADOT Access Management Guidelines (November 2014) shown in ***Table 2***. ***Appendix WP1-1*** illustrates those access points that are more closely spaced than recommended on the same side of the roadway.

Table 5 – Summary of Existing Intersections*

Cross Street Name	Intersection ID No.	Access Type	Ownership
W Butterfield Road	1	Full Access	Public
Adams Road	2	Full Access	Public
W Palomino Road	3	Full Access	Public
Unnamed Alley	4	*Full Access*	*Private*
Road 3 1/2N	5	Full Access	Public
Road 3 1/2N	6	Full Access	Public
Commercial Way	7	Full Access	Public
Industrial Drive	8	Full Access	Public
Jack Dale Drive	9	Full Access	Private
Choctaw Lane	10	Full Access	Public
Staley Lane	11	Full Access	Public
Road 5N	12	Full Access	Public

Table 5 – Summary of Existing Intersections*			
Cross Street Name	**Intersection ID No.**	**Access Type**	**Ownership**
Road 5N	13	Full Access	Public
Road 5 1/2N	14	Full Access	Public
Road 6 N	15	Full Access	Public
Road 6 N	16	Full Access	Public
Del Rio Ranch Road	17	Full Access	Public
Bethany Lane	18	Full Access	Public
Old Highway 89	19	Full Access	Public
Buffalo Run Road	*20*	*Full Access*	*Private*
Livernois Way	*21*	*Full Access*	*Private*
Frontier Road	*22*	*Full Access*	*Private*
El Rocko Lane	*23*	*Full Access*	*Private*
Bald Eagle Trail	*24*	*Full Access*	*Private*
Rolling Hills Road	25	Full Access	Public
Little Ranch Road	*26*	*Full Access*	*Private*
Sweet Valley Road	*27*	*Full Access*	*Private*
Old Highway 89	28	Full Access	Public
Big Chino Road	29	Full Access	Public
Laguna Trail	30	Full Access	Public
Pittsburgh Road	31	Full Access	Public
Verde Ranch Road	*32*	*Full Access*	*Private*
Verde Ranch Road	33	Full Access	Public
Bramble Drive	34	Full Access	Public
Clayton Road	*35*	*Full Access*	*Private*
Old Highway 89	*36*	*Full Access*	*Private*

*Italics denotes private access

Table 6 – Summary of Existing Driveways							
Driveway ID No.	**Access Type**		**Driveway ID No.**	**Access Type**		**Driveway ID No.**	**Access Type**
W1	RIRO		W10	Full Access		W23	Full Access
W2	Full Access		E21	Full Access		E37	Full Access
E1	RIRO		W11	Full Access		E42	Full Access
E2	Full Access		W12	Full Access		E43	Full Access
E3	Full Access		E22	Full Access		W25	Full Access
W4	Full Access		E23	Full Access		E44	Full Access
E4	Full Access		E24	Full Access		E45	Full Access
W3	Full Access		W13	Full Access		W26	Full Access
W1	RIRO		W14	Full Access		E46	Full Access
E5	Full Access		E25	Full Access		E47	Full Access
W5	Full Access		E26	Full Access		E48	Full Access
E6	Full Access		E27	Full Access		E49	Full Access
E7	Full Access		E28	Full Access		E50	Full Access
E8	Full Access		E29	Full Access		E51	Full Access
E9	Full Access		W15	Full Access		W27	Full Access
W6	Full Access		E30	Full Access		E52	Full Access
E10	Full Access		W16	Full Access		W28	Full Access
W7	Full Access		W17	Full Access		E53	Full Access
E11	Full Access		E31	Full Access		E54	Full Access
E12	Full Access		W18	Full Access		W29	Full Access
E13	Full Access		E32	Full Access		E55	Full Access
E14	Full Access		W19	Full Access		E56	Full Access
E15	RIRO		W20	Full Access		E57	Full Access
E16	RIRO		E33	Full Access		E58	Full Access
E17	Full Access		W21	Full Access		E59	Full Access
W8	Full Access		W22	Full Access		W30	Full Access
E18	Full Access		E34	Full Access		W31	Full Access
W9	Full Access		E35	Full Access		W32	Full Access
E19	Full Access		E36	Full Access		W33	Full Access
E20	Full Access					E60	Full Access

Table 7 identifies driveways that did not meet minimum recommended spacing in the ADOT draft Access Management Guidelines for corner clearance on one side of the road, as summarized in ***Table 3.***

Table 7 – Corner Clearance Spacing Less than Recommended			
Northbound		**Southbound**	
Driveway No.	**Cross Street Name**	**Driveway No.**	**Cross Street Name**
E1	Adams Road	W1	W Butterfield Road
E1, E2, E3, E4, E5	Road 3N	W2	W Palomino Road
E5	Unnamed Alley	W3, W4, W5	Road 3N
E6, E7, E8, E9, E10	Road 3 1/2N	W6	Road 3 1/2N
E14, E15, E16	Road 4N	W6	Commercial Way
E17, E18, E19, E20, E21, E22	Jack Dale Drive	W7	Industrial Drive
E29, E30, E31	Staley Lane	W9, W10, W11, W12, W13, W14	Choctaw Lane
E30, E31	Road 5N	W16, W17	Road 5N
E37, E38, E39, E40, E41, E42, E43	Livernois Way	W23, W24	Buffalo Run Road
E44	Bald Eagle Trail	W24, W25	Frontier Road
E58, E59	Pittsburgh Road	W26	Little Ranch Road
		W30, W31, W32	Verde Ranch Road
		W32, W33	Bramble Drive

3.7.2. Truck and Freight Movement

Both trucks and trains move through the Study Area. The percentage of vehicles that are trucks traveling along SR 89 through the Study Area range from 5% in the south to as high as 14% north of Bramble Drive (MP 338.8).

Trucks which exceed 14 feet in width, 16 feet in height, 120 feet in length, or exceed 250,000 pounds require a Class C permits. In the 13 month period from January 2015 and February 2016, 77 Class C permits were issued for travel through the Study Area.

Trains traverse the Study Area via the BNSF Railway (MP 337.38). The single-span structure supports a single track and carries roughly nine trains a day. It is not known if there are plans for future expansion or if there are any cargo size limitations.

3.7.2.1. Class C Permits

Class C permits are required for loads that exceed 14 feet in width, 16 feet in height, 120 feet in length, and exceed 250,000 pounds. ***Table 8*** lists the number and type of permits issued between January 2015 and February 2016. Permit data is not available prior to January 2015 due to a change in how ADOT stored permit data in January 2015.

Table 8 – Permits Issued between January 2015 and February 2016	
Permit Type	**Number Issued**
Single Trip Class C Oversize	59
Single Trip Easy Class C	11
Single Trip Mobile Home OS	7
Single Trip Class C Oversize/Overweight	0

3.7.2.2. Routing Constraints

Several infrastructure limitations both within and external to the study limits may be reducing the number of permit requests. These factors include weight limit restriction at the Hell Canyon Bridge (MP 345.70; restricted to 80,000 pounds). Additional restrictions include the difficulty of loads exceeding 120 feet navigating the roundabouts within and south of the Study Area along SR 89.

3.7.2.3. Critical Length of Grade

Critical length of grade calculations are performed to determine the distance on an effective grade where the speed of heavy vehicles is reduced by 10 mph or greater. The figures provided by AASHTO in the 2011 *A Policy on Geometric Design of Highways and Streets* (Green Book) which are used when calculating the critical length of grade assume an initial speed of 70 mph. A critical length of grade is achieved between MP 339.98 and MP 340.49. The speed data collected for northbound (upgrade) traffic near MP 341 indicate that 63% of vehicles were traveling 65 mph or faster.

3.7.3. Bicycle and Pedestrian Network

Within the limits of Chino Valley, there are intermittent sections of sidewalk immediately adjacent to various roadway intersections. There are no other dedicated pedestrian facilities along SR 89.

While there are no unattached bicycle facilities within the project limits, the 2012 AASHTO Guide for the Development of Bicycle Facilities states that five-foot wide paved shoulders provide cyclists adequate area to maneuver on facilities with vehicular speeds less than 50 mph. Additional shoulder width should be provided along facilities with speeds 50 mph or faster or facilities with heavy truck use. The paved shoulder width along SR 89 is eight-feet or wider from MP 329.3 to MP 340.4 and six-feet wide from MP 340.4 to the northern limit of the Study Area.

3.7.4. Transit Network

Yavapai Regional Transit, Inc. (YRT) provides regular transit service between Prescott, Prescott Valley, and Chino Valley. YRT was originally started in 2009 as Chino Valley Transit and officially became YRT in 2013. The Gold Route extends farther north than any other year-round route; its northern limit is Road 3N, with an allowable one mile route deviation zone in Chino Valley to accommodate individuals with mobility limitations. The Gold Route provides a connection to the Blue and Red Routes, and ultimately Prescott and Prescott Valley. The Blue and Red Routes only operate on Friday.

YRT is providing seasonal service in the summer of 2016 to provide a connection between Paulden and the Chino Valley Pool. The northern limit of the seasonal service is the Paulden Christian Fellowship Church.

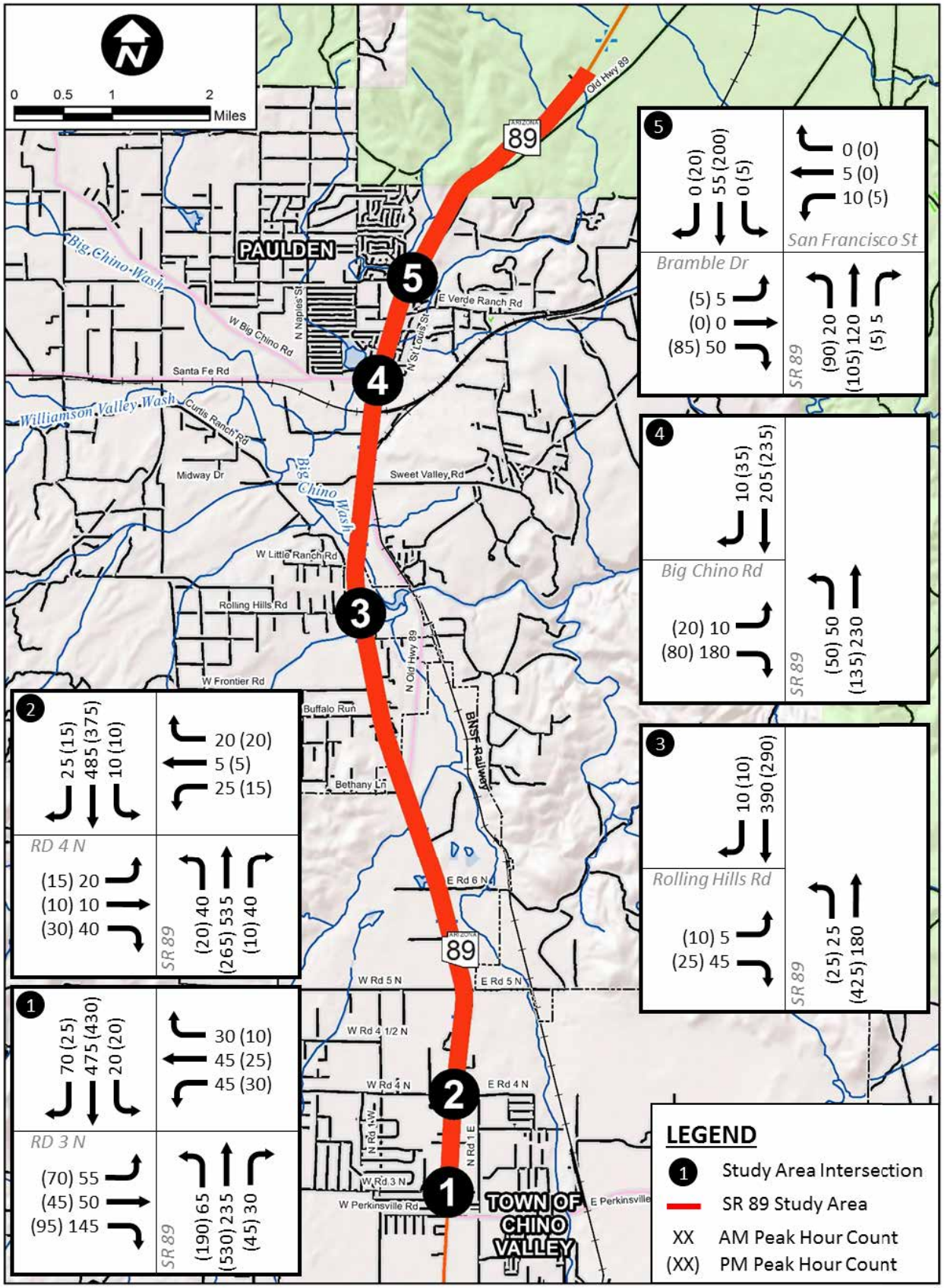
3.8. Traffic Analysis

3.8.1. Existing Traffic Volumes

Traffic counts were collected on March 23, 2016. Daily 24-hour counts and turning movement counts for the morning and evening peak hours were collected in the Study Area as shown on ***Figure 11***. More detailed traffic count data, including vehicle classification counts, is included in ***Appendix WP1-3***.

Daily traffic volumes for the Study Area can be generally characterized as medium in the southern portion of the corridor and low in the north. Daily traffic volumes on SR 89 were approximately 12,900 vehicles north of Road 3N, 9,200 vehicles south of Rolling Hills Road, and 3,800 north of MP 341. Along the corridor, truck percentages range from 5% in the south to as high as 14% north of Bramble Drive.

Figure 11 – Existing Traffic Volumes



3.8.2. Traffic Operational Analysis

Existing capacity analysis was conducted for the existing (2016) conditions at the five intersections identified in ***Figure 11***. *HCS* software which uses the *Highway Capacity Manual* methodology was used for all intersections, except the intersection of SR 89 with Road 4N. This intersection is a roundabout; therefore, *SIDRA* software was used to analyze the intersection with *Highway Capacity Manual* methodologies. *HCS* and *SIDRA* results are included in ***Appendix WP1-4.***

Table 9 summarizes the 2016 AM and PM peak hour capacity analysis results, which are presented in terms of Level of Service (LOS) and delay. LOS is a qualitative value of how well a roadway or intersection operates. A grading system of A through F is assigned. LOS A represents free-flow traffic operations with little vehicle delay; LOS F represents substantial congestion and vehicle delay. Operations of LOS C and better are typically considered good and acceptable. Operations of LOS D, E or F typically need attention.

Table 9 – 2016 AM & PM Peak Hour Capacity Analysis

Intersection*	Approach	2016 AM Peak		2016 PM Peak	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Intersection 1 SR 89 & Road 3N	Eastbound	D	39.1	D	42.8
	Westbound	D	38.6	D	41.9
	Northbound	A	8.9	A	7.7
	Southbound	B	11.7	A	9.4
	Overall	**B**	**19.0**	**B**	**14.6**
Intersection 2 SR 89 & Road 4N	Eastbound	A	5.7	A	5.0
	Westbound	A	4.8	A	6.0
	Northbound	A	5.0	A	6.8
	Southbound	A	6.4	A	5.7
	Overall	**A**	**5.8**	**A**	**6.3**
Intersection 3 SR 89 & Rolling Hills Road	Eastbound	B	11.9	B	12.0
	Northbound	A	1.0	A	0.4
	Southbound	A	0.0	A	0.0
	Overall	**A**	**1.2**	**A**	**0.8**
Intersection 4 SR 89 & Big Chino Road	Eastbound	B	11.6	B	13.3
	Northbound	A	2.1	A	3.7
	Southbound	A	0.0	A	0.0
	Overall	**A**	**4.4**	**A**	**3.7**
Intersection 5 SR 89 & Bramble Drive	Eastbound	A	9.1	B	10.6
	Westbound	B	11.2	C	15.0
	Northbound	A	1.0	A	3.6
	Southbound	A	0.0	A	0.2
	Overall	**A**	**3.7**	**A**	**3.0**

*Refer to ***Figure 11*** for intersection number.

The analysis indicates that the intersections operate very well with an overall LOS A or B. All approaches operate at LOS C or better except the intersection of SR 89 and Road 3N. However, at this location, the side street approaches still operate at an acceptable LOS D which is typical for a signalized intersection with significantly lower volumes on the minor approaches compared to the mainline.

3.8.3. Crash Analysis

Crash data for the five-year period from November 30, 2010 to November 30, 2015 was obtained from the Accident Location Identification Surveillance System (ALISS) database. Within this period, 203 crashes occurred within the Study Area. There were 41 crashes in 2011, 36 crashes in 2012, 48 crashes in 2013, and 40 crashes in 2014. There were 5 crashes and 33 crashes in the partial years 2010 and 2015, respectively. 65 of the 203 crashes (32%) resulted in death or injury, which is consistent with the statewide average injury crash percentage for 2010 to 2014 (32.4%). There were three fatalities reported during the 5-year study period. A summary of total crashes is provided in ***Table 10***.

Recently, a fatal crash occurred at MP 335 on February 25, 2016; due to its severity, it will be included in the crash review, but excluded from statistical analysis. It is shown in ***Appendix WP1-1***. It was a rear end crash during daylight hours.

A roundabout was constructed at Road 4N and completed in September 2015. A roundabout was constructed at Perkinsville Road and recently completed. The effects of these improvements are not reflected in the crash data, as the analysis period narrowly overlaps the completion of the roundabout at Road 4N.

Crash mapping, including the crash type, severity, and location, is shown in the map book in ***Appendix WP1-1***. A crash heat map indicating crash density within the corridor is shown in ***Figure 12***. There is a higher crash density in the southern portion of the corridor.

Table 10 – Crash Severity

Crash Severity	Number	SR 89%	Statewide Average %*
Fatal	3	1.5%	0.69%
Injury	62	30.5%	31.74%
Property Damage Only	138	68.0%	67.57%
Total	**203**	**100.0%**	**100.0%**

*Average of all crashes from 2010-2014

Figure 12 – Crash Heat Map

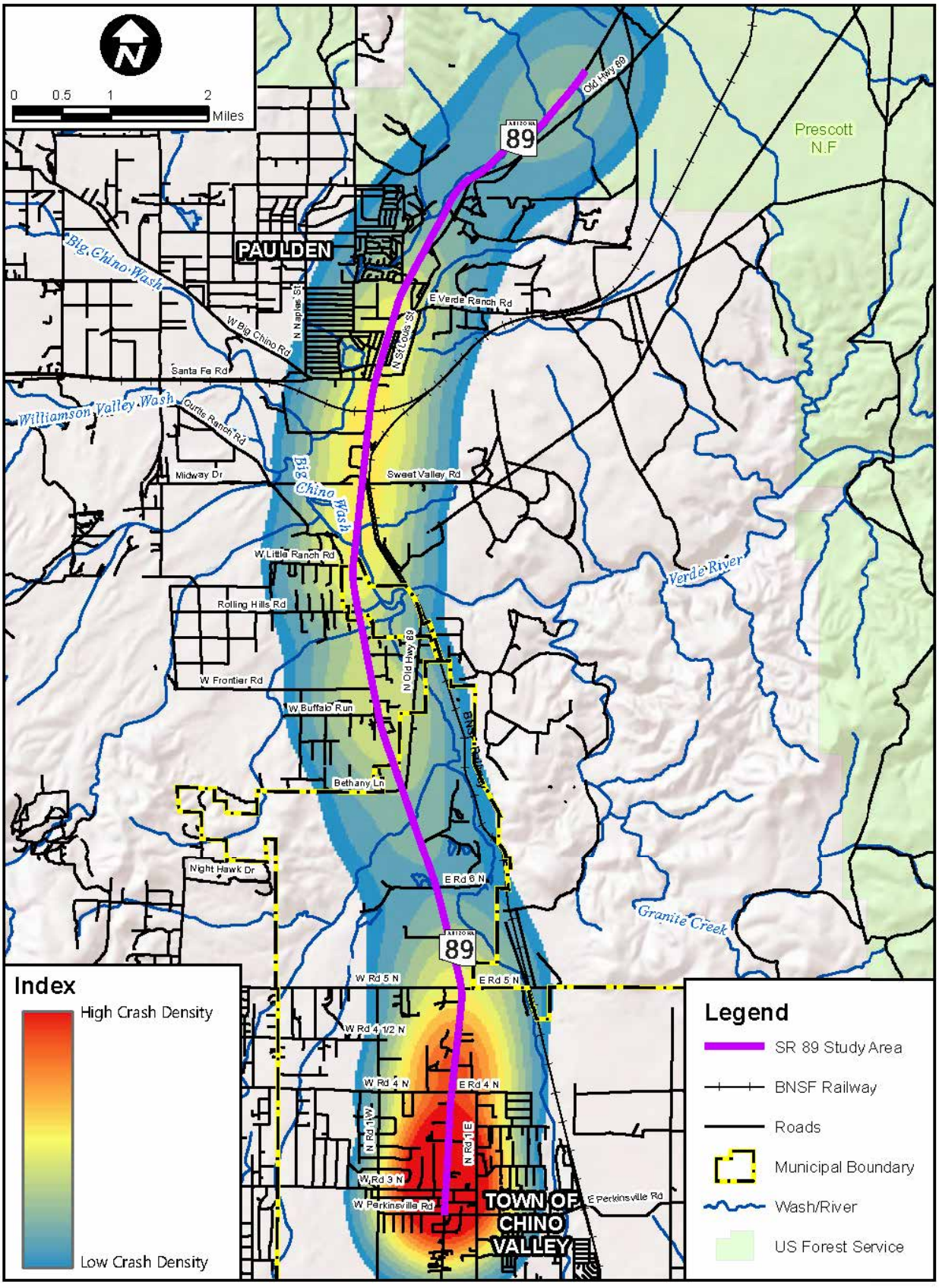


Table 11 compares the manner of collision in multi-vehicle crashes in the Study Area with the 2014 statewide averages. Within the corridor, rear end, left turn, and sideswipe (same direction) crashes are the most prevalent. Left turn and sideswipe (opposite direction) crashes exceed the 2014 statewide average crash rate for these crash types.

Table 11 – Multiple Vehicle Crashes

Type of Crash	Number	SR 89%	2014 Statewide Average %
Rear End	49	24.1%	46.0%
Left Turn	32	**15.8%**	14.9%
Sideswipe (Same Direction)	17	8.4%	13.2%
Angle	11	5.4%	16.2%
Sideswipe (Opposite Direction)	7	**3.4%**	1.4%
Head On	3	1.5%	1.8%
Other	3	1.5%	
Unknown	1	0.5%	
Total	**123**	**60.6%**	

Table 12 compares the remaining first harmful event with the statewide average for rural areas. Some of these crashes included more than one vehicle. Fixed object, animal, and other non-fixed object crashes were the most prevalent, with both fixed object and animal crashes exceeding the statewide rural average. Other non-collision crashes also exceeded the statewide rural average.

Table 12 – Other Vehicle Crashes

Type of Crash	Number	SR 89%	2014 Statewide Rural Ave. %
Fixed Object	39	**19.2%**	18.3%
Animal	15	**7.4%**	7.2%
Other Non-fixed Object*	10	4.9%	5.5%
Overturning	9	4.4%	8.1%
Other Non-collision**	5	**2.5%**	2.0%
Pedestrian	1	0.5%	0.7%
Other	1	0.5%	
Total	**80**	**39.4%**	

*Includes Collision with Parked Vehicles, Trains, Railway Vehicles, and Work Zone Equipment
**Includes Vehicle Immersion, Jackknife, and Cargo Loss or Shift

As indicated in ***Table 13***, the majority of crashes in the corridor occur on Friday, which is closely followed by Saturday and Wednesday. Statewide, there are fewer crashes on Saturday and Sunday than any other day of the week. DUIs were issued in 4.4% of crashes in the corridor (9 crashes) which is on par with the statewide average of crashes involving alcohol (4.42%). Of these DUI-related crashes, 5 occurred on Friday. In 24 of the 203 total crashes, the driver was cited for distracted driving; 8 (33.3%) of these occurred on Wednesday.

Table 13 – Crash Distribution by Day		
Day of Week	**Number**	**%**
Friday	41	20.2%
Saturday	36	17.7%
Wednesday	35	17.2%
Monday	25	12.3%
Tuesday	25	12.3%
Thursday	24	11.8%
Sunday	17	8.4%
Total	**203**	**100.0%**

3.8.3.1. Segmented Crash Analysis

As described in Section 3.0, the character of the corridor changes substantially north of Road 5N. The crash characteristics were evaluated from Road 5N south, including crashes at the intersection of Road 5N. Crashes were also evaluated from Road 5N north, excluding crashes at the intersection of Road 5N.

3.8.3.1.1. Crash Analysis for Study Area South of Road 5N

As shown in ***Table 14***, rear end, left turn, and sideswipe (same direction) are the most prevalent crash types south of Road 5N. Left turn crashes are 1.5 times the 2014 statewide average. Sideswipe (same direction) crashes slightly exceed the statewide average. While there are fewer total sideswipe (opposite direction) crashes, 5.2%, the occurrence is over three times the statewide average. 12.4% of crashes within this extents are single vehicle crashes.

Table 14 – Crash Characteristics South of Road 5N			
Type Of Crash	**Number**	**S of Road 5N SR 89%**	**2014 Statewide/ *Statewide Rural Ave.%***
Rear End	31	32.0%	46.0%
Left Turn	22	**22.7%**	14.9%
Sideswipe (Same Direction)	13	**13.4%**	13.2%
Fixed Object	10	10.3%	*18.3%*
Angle	8	8.2%	16.2%
Sideswipe (Opposite Direction)	5	**5.2%**	1.4%
Overturning	2	2.1%	8.1%
Other Non-Collision**	1	1.0%	2.0%
Animal	1	1.0%	7.2%
Other	3	3.1%	
Unknown	1	1.0%	
Total	**97**	**100.0%**	

*Includes Collision with Parked Vehicles, Trains, Railway Vehicles, and Work Zone Equipment
**Includes Vehicle Immersion, Jackknife, and Cargo Loss or Shift

Crashes were fairly evenly distributed in the northbound and southbound directions, with 29.9% of crashes southbound and 38.1% traveling northbound; crashes reported as east, west, southwest, northwest, northeast, and unknown accounted for 32.0% of crashes.

As shown in ***Table 15***, most crashes occurred at intersections (not the segment in between) within this portion of the corridor. Crash data was collected from 2010 to 2015; since that time, roundabouts were constructed at Road 4N and Perkinsville Road. Crash data indicated conditions before these facilities were built. Characteristics of the other intersections have not changed. Road 3N is signalized. There is a two way left turn lane at Palomino Road. There is a horizontal curve at Road 5N and the east and westbound approaches are offset; no turn lane is provided.

Table 15 – Top Five Crash Locations South of Road 5N

Location	Number	% of Total
Road 3 North	22	22.7%
Road 4 North	20	20.6%
Perkinsville Road	15	15.5%
Palomino Road	13	13.4%
Road 5 North	8	8.3%
Total	**78**	**80.4%**

Table 16 reflects crash characteristics south of Road 5N, with crashes at Perkinsville Road and Road 4N removed from the analysis to allow review of the corridor, excluding the recently improved intersections. Rear end, left turn, and fixed object crashes are the most prevalent. The percentage of left turn and sideswipe (opposite direction) exceed the statewide averages (1.7 and 5.6 times the statewide average, respectively).

Table 16 – Crash Characteristics South of Road 5N Excluding Perkinsville Road and Road 4N

Type Of Crash	Number	S of Road 5N SR 89%	2014 Statewide/ *Statewide Rural Ave.%*
Rear End	22	35.5%	46.0%
Left Turn	16	**25.8%**	14.9%
Fixed Object	6	9.7%	*18.3%*
Sideswipe (Opposite Direction)	5	**8.1%**	1.4%
Sideswipe (Same Direction)	5	8.1%	13.2%
Angle	3	4.8%	16.2%
Overturning	1	1.6%	8.1%
Other Non-Collision**	1	1.6%	2.0%
Animal	1	1.6%	7.2%
Other	2	1.6%	
Total	**62**	**100.0%**	

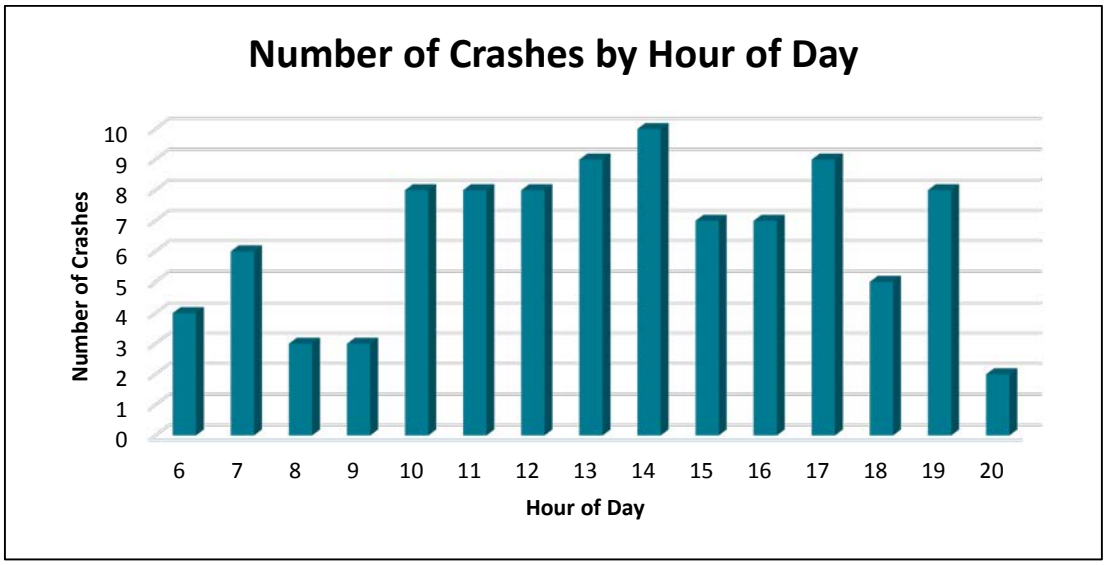
*Includes Collision with Parked Vehicles, Trains, Railway Vehicles, and Work Zone Equipment
**Includes Vehicle Immersion, Jackknife, and Cargo Loss or Shift

The distribution of crashes for light conditions is comparable to the 2014 statewide averages, as shown in ***Table 17.***

Table 17 – Crash Lighting South of Road 5N			
Light Conditions	**Number**	**S of Road 5N SR 89%**	**2014 Statewide Average %**
Daylight	81	83.5%	72%
Dark – Not Lighted	9	9.3%	6%
Dusk	4	4.1%	3%
Dark – Lighted	2	2.0%	17%
Dark – Unknown Lighting	1	1.0%	1%
Total	**97**	**100.0%**	

The hourly crash distribution south of Road 5N is shown in ***Figure 13***. No crashes were observed between 8pm and 6am; 2pm is the observed peak hour for crashes. Traffic counts at Road 3N indicate volumes are very low between 8pm and 6am (roughly 8% of total daily trips); AM and PM peak hours are 6:30am and 4pm.

Figure 13 – Hourly Distribution of Crashes South of Road 5N



In general, crashes south of Road 5N are clustered around existing intersections. Access spacing often exceeds the density recommended in the draft ADOT Access Management Guidelines. Left turn lanes are provided in some locations; there are no medians other than at the roundabout approaches. The speed limit was recently reduced in this area, but speed may still be a contributing factor.

3.8.3.1.2. Crash Analysis for Study Area North of Road 5N

As shown in ***Table 18***, fixed object, rear end, and animal collisions are the most prevalent crash types north of the intersection at Road 5N; 54.7% of crashes are single vehicle crashes. Fixed object and animal crashes are 1.5 and 1.75 times the statewide average, respectively. Drivers in

12 of the 29 fixed object crashes (41.3%) were either cited for exceeding the lawful speed or driving at speed too fast for conditions.

Table 18 – Crash Characteristics North of Road 5N

Type of Crash	Number	N of Road 5N SR 89%	Statewide/ *Statewide Rural Ave.%*
Fixed Object	29	**27.4%**	*18.3%*
Rear End	18	17.0%	46%
Animal	14	**13.2%**	*7.2%*
Left Turn	10	9.4%	14.9%
Other Non-fixed Object*	10	**9.4%**	*5.5%*
Overturning	7	6.6%	*8.1%*
Sideswipe (Same Direction)	4	3.8%	13.2%
Head On	3	**2.8%**	1.8%
Angle	3	2.8%	16.2%
Sideswipe (Opposite Direction)	2	1.9%	1.4%
Other Non-collision**	3	**2.8%**	*2.0%*
Pedestrian	1	0.9%	*1.0%*
Other	2	1.9%	
Total	**106**	**100.0%**	

*Includes Collision with Parked Vehicles, Trains, Railway Vehicles, and Work Zone Equipment
**Includes Vehicle Immersion, Jackknife, and Cargo Loss or Shift

Crashes were fairly evenly distributed in the northbound and southbound directions, with 42.5% of crashes southbound and 49.1% traveling northbound; crashes reported as eastbound and westbound accounted for 8.4% of crashes.

There was a higher occurrence of nighttime crashes than the statewide average (32% compared to 23%), as shown in ***Table 19***.

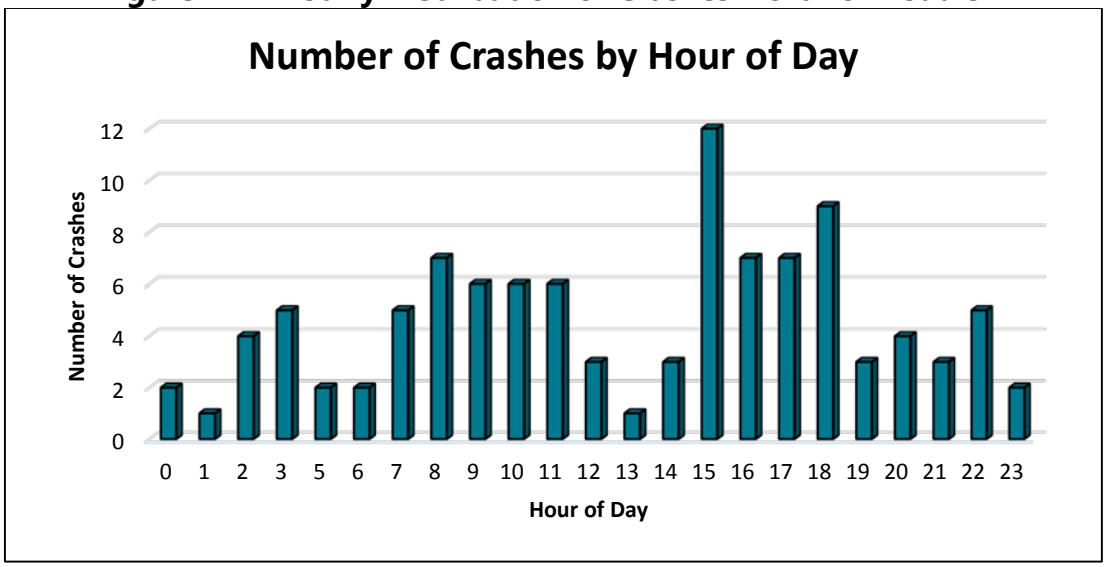
Table 19 – Crash Lighting North of Road 5N

Light Conditions	Number	N of Road 5N SR 89%	Statewide Average %
Daylight	67	63.2%	72%
Dark – Not Lighted	33	31.1%	6%
Dawn	3	2.8%	2%
Dusk	2	1.9%	3%
Dark – Lighted	1	1.0%	17%
Dark – Unknown			1%
Total	**106**	**100.0%**	**100%**

The hourly crash distribution north of Road 5N is shown in ***Figure 14.*** More crashes occurred at 3pm than any other time of day. Traffic counts indicate the PM peak hour occurs at 4pm. Speed data was also gathered and indicates that nearly 90% of southbound vehicles (all times of day)

are speeding north of MP 341, with 16% exceeding 10 mph over the posted speed. Over 60% of northbound vehicles at the same location are speeding, with nearly 5% exceeding 10mph over the posted speed.

Figure 14 – Hourly Distribution of Crashes North of Road 5N



In general, the crashes north of Road 5N are either clustered around existing intersections or are single vehicle crashes involving an animal or run off the road (fixed object). A disproportionate number of crashes occur at night compared to the statewide average. This area includes a portion of the PNF and is in close proximity to the Big Chino Wash and other 404 designated washes. The presence of these natural resources likely attracts wildlife.

4.0 Environmental Considerations

4.1. Natural Resources

Based on an aerial review of the Study Area, the majority of the corridor lies within the Plains and Great Basin Grassland Biotic Community (Brown 1994) with the northern-most portion extending into Great Basin Conifer Woodland (Brown 1994). Geological formations vary and include early Pleistocene to latest Pliocene surficial deposits; Pliocene to late Miocene basaltic rocks; undivided Quaternary surficial deposits; and Mississippian, Devonian, and Cambrian sedimentary rocks (Ludington et. al 2005). Soils within the Study Area include Mesic Semiarid soils of the Pasura-Abra-Lynx, Cabezon-Thunderbird-Springerville, Tortugas-Purner-Jacks, and Pastura-Poley-Partri Associations (Hendricks 1985).

The landscape throughout the Study Area is primarily open grassland with sparsely scattered junipers (*Juniperus spp*.). Understory vegetation includes scattered shrubs and succulents such as saltbush (*Atriplex spp*), yucca (*Yucca spp*), and cholla (*Cylindropuntia spp*). The northern portion of the Study Area, as it enters Great Basin Conifer Woodland, consists of more dense and uniformly distributed stands of juniper and includes an understory of shrubs such as cliffrose (*Purshia spp*.) and wolfberry (*Lycium spp*).

4.2. Water

Several ephemeral drainages bisect SR 89 throughout the Study Area, including an ephemeral/ intermittent portion of the Big Chino Wash that crosses SR 89 near MP 336.00. However, the stretch of the Big Chino Wash that bisects the Study Area does not contain riparian or wetland vegetation, as the banks of the river are vegetated with only grasses and forbs. Therefore, there are no riparian corridors, wetlands, or perennial or semi-perennial sources of water within the Study Area.

All surface waters within the Study Area are ephemeral and no perennial drainages or permanent open waters are present. The primary drainage features in the Study Area are the Big Chino Wash, which flows in an easterly direction, and Little Chino Wash, which generally flows north and is a tributary to the Verde River. Several additional unnamed drainage features that would likely be considered waters of the U.S. and would be under the U.S. Army Corps of Engineers (USACE) jurisdiction are also present within the Study Area. All drainage features within the area flow toward the Big Chino Wash, which crosses SR 89 at approximately MP 335.96. Terrain throughout the Study Area is fairly flat, causing storm water runoff to collect in surface depressions rather than directionally flowing through the area. Several of these surface depressions are located within the Study Area and are documented as wetland and ephemeral pond features by the US Fish and Wildlife Service National Wetland Inventory database. Field investigation of these features would be necessary to determine if they have the soil, vegetative, and hydraulic attributes that would classify them as wetlands under the jurisdiction of the USACE.

4.3. Fish, Wildlife, and Plants

Species lists from the AGFD, U.S. Fish and Wildlife Service (USFWS), and PNF were obtained to determine special status species potentially occurring in the vicinity of the Study Area.

4.3.1. Fish

Several native fish species are known to occur in the vicinity of the Study Area along the Big Chino Wash. The Gila longfin dace (*Agosia chrysogaster chrysogaster*), spikedace (*Meda fulgida*), desert sucker (*Catostomus clarkii*), Sonora sucker (*Catostomus insignis*), razorback sucker (*Xyrauchen texanus*), headwater chub (*Gila nigra*), and roundtail chub (*Gila robusta*) were identified as potentially occurring in the vicinity of the Study Area. However, there are no adequate water sources present within the Study Area; thus, native fish species are not anticipated to be impacted.

4.3.2. Wildlife

The black-footed ferret (*Mustela nigripes*), northern Mexican gartersnake (*Thamnophis eques megalops*), western yellow-billed cuckoo (*Coccyzus americanus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), and western burrowing owl (*Athene cunicularia hypugaea*) have potential to occur within the vicinity of the Study Area. Suitable habitat for the black-footed ferret includes grassland plains in association with prairie dog colonies. However, the Study Area is located outside of the current distribution of the black-footed ferret. The nearest occupied habitat for black-footed ferret is located over 40 miles northwest in the 10(j) experimental non-essential population within Aubrey Valley. Furthermore, based on an aerial review of the Study Area, it does not appear that any prairie dog colonies are present along the corridor. Suitable habitat for the yellow-billed cuckoo and northern Mexican gartersnake includes large blocks of riparian woodlands and streamside gallery forests. However, no adequate water sources or riparian woodlands are located within the Study Area. The nearest riparian corridor is located approximately two miles east of the Study Area at the confluence of Granite Creek and the Verde River. Potential improvements are not anticipated to effect to yellow-billed cuckoo and the northern Mexican gartersnake. The open landscape of the Study Area does not contain large cliffs suitable for nesting eagles; however, few tall trees are present near Sullivan Lake and on private property that may provide suitable nesting habitat for eagles. Eagles are known to occur within the vicinity of the Study Area and a bald eagle nest site has been documented near Sullivan Lake. Potential future improvements to SR 89 would not result in a decline in prey populations, or hinder bald or golden eagle foraging habits or movement through the study corridor. If an eagle nest is located adjacent to the Study Area, noise impacts may occur from potential future projects if conducted during the breeding season.

Suitable habitat for the western burrowing owl consists of variable, open well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. The open grasslands throughout much of the Study Area provide suitable habitat for the western burrowing owl. Therefore, pre-construction surveys for burrowing owls would be needed prior to any ground disturbing activities. Western burrowing owls are protected by the federal Migratory Bird Treaty Act, and possible future improvements within the study corridor resulting in ground disturbance have the potential to result in injury or death to eggs, young, or adult burrowing owls. Therefore, the project has the potential to result in "take" of birds protected by the Migratory Bird Treaty Act.

Possible future improvements to SR 89 have the potential to result in “take” of roosting bats and nesting migratory birds. Suitable habitat for roosting bats and nesting swallows is present along bridge structures throughout the study corridor. In order to avoid impacts to bats and migratory

birds, bridge structures within the study corridor should be inspected for nesting birds and roosting bats prior to conducting bridge work. Additionally, vegetation clearing activities conducted within the migratory bird breeding season (March 15 – August 31) have the potential to result in "take" of nesting migratory birds. Therefore, vegetation removal, involving the removal of trees, should be conducted outside of breeding bird season in order avoid any restrictions. If vegetation removal must occur within breeding bird season, mitigation measures should be implemented in order to reduce impacts to nesting birds.

4.3.3. Plants

Two PNF sensitive species, Rusby's milkwort (*Rhinotropis rusbyi*) and Verde Valley Sage (*Salvia dorrii mearnsi*), were documented as occurring within three miles of the Study Area. Suitable substrate for Rusby's milkwort includes sandy flats and limestone bedrock, rock, gravel and silt within pinyon – juniper woodland. Pockets of suitable habitat are present throughout the Study Area. Suitable habitat for Verde Valley sage includes red-brown clay and sandy soil of Supai/Hermit Formation and Redwall Limestone within Pinyon – Juniper Woodland. Suitable habitat is present along the northern portion of the Study Area. Potential future improvements to the study corridor resulting in vegetation removal may impact individuals if present.

Plants protected by the Arizona Native Plant Law may be impacted by potential future improvements within the corridor. Therefore, to ensure protected native plants are not impacted, mitigation measures should be implemented during future projects.

4.4. Critical Habitat

Critical habitat for five federally listed species was identified as occurring within three miles of the Study Area. Designated critical habitat for the spikedace and loach minnow (*Tiaroga cobitis*); and proposed critical habitat for the narrow-headed gartersnake (*Thamnophis rufipunctatus*), northern Mexican gartersnake, and yellow-billed cuckoo are found 0.35 miles east of the Study Area along the Verde River. However, critical habitats are located outside of the Study Area and therefore are not anticipated to be impacted by potential future improvements to SR 89.

4.5. Wildlife Connectivity

The AGFD On-line Environmental Review Tool receipt included a standard response regarding local or regional needs of wildlife movement, connectivity, access to habitat needs and design of various roadway features such as culverts and bridges. ADOT, AGFD, the Federal Highway Administration and representatives from other agencies have completed a Wildlife Linkages Assessment to address important wildlife movement corridors in Arizona. The study corridor lies within two potential linkage zones (PLZ) and one linkage design. The East – West PNF PLZ #35 occurs along SR 89 between MP 328.95 and MP 339.80 and the Big Black Mesa – Hell Canyon PLZ #22 occurs from MP 339.80 to MP 341.42. Additionally, the study corridor occurs within the Granite Mountain – Black Hills Linkage Design between MP 335.25 and MP 337.15 as well as MP 338.92 and MP 339.95.

4.6. Cultural Resources

The SR 89 right-of-way (R/W) corridor within the Study Area, between MP 328.95 and MP 341.42, has been previously surveyed for cultural resources as summarized in ***Table 20***. In

addition, a ½-mile buffer on each end of the project limits (between MP 328.45 to MP 341.92) and a ½-mile buffer east and west of the SR 89 corridor was researched.

The SR 89 corridor (including the buffer zone) between MP 328.45 and MP 331.30 is developed with numerous residences and businesses located along both sides of the roadway. Between MP 331.30 and MP 337.70, the corridor is primarily undeveloped agricultural fields with small, scattered pockets of developed residential areas. The area between MP 337.70 and MP 338.75 is again developed (residences), but to a lesser degree than between MP 328.95 and MP 331.30. The final stretch of the SR 89 study corridor, between MP 338.75 and MP 341.42 (including the buffer zone) is almost entirely undeveloped.

Two prehistoric artifact scatters are located within the SR 89 R/W. One scatter is eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D; the NRHP eligibility of the other scatter is undetermined. One additional prehistoric artifact scatter (NRHP eligible - Criterion D) is located within the ½-mile buffer research area. All three sites would require testing and/or data recovery if they cannot be avoided by any potential project.

Five abandoned segments of historic SR 89 are located within and outside the R/W corridor. Historic SR 89 is overall eligible for inclusion in the NRHP under Criterion D, and is part of the Historic State Highway System (HSHS). The majority of SR 89, within the Study Area, has been widened and modernized. Four of the five abandoned segments are non-contributing components to the overall eligibility of the site. The fifth segment is a contributing component. HSHS documentation of the portion of SR 89 that has not been widened and modernized, and contributing segments that would be affected by any potential project, is recommended.

According to the AZSITE database, the historic Santa Fe, Prescott & Phoenix Railway line is located approximately 350 feet east of SR 89, between MP 336.65 and MP 336.90. The site is overall eligible for inclusion in the NRHP under Criteria A and D. If the historic railway line cannot be avoided, research would need to be conducted to determine if the affected segment is a contributing or non-contributing component.

Historic buildings and structures are located along SR 89 throughout the Study Area. The most notable are Del Rio Springs (ca. 1900), Verde River Bridge (1923), and Sullivan Lake Dam (1938), which are all located approximately ½ mile east of the SR 89 corridor between Chino Valley and Paulden. A comprehensive historic building survey of the area completed in 1995 identified 21 properties that were potentially eligible for the NRHP, but a brief survey of Yavapai County Assessor records indicated that most of these buildings no longer exist. As the study is now more than 20 years old, a re-evaluation of these properties is recommended to determine NRHP eligibility and the impact of any project on these historic buildings/structures.

As there are many undeveloped/undisturbed parcels along both sides of SR 89 within the Study Area, it is recommended that those parcels be resurveyed for cultural resources since the SR 89 R/W was surveyed 17 to 21 years ago. New R/W and Temporary Construction Easement (TCE) parcels would also require a new cultural resource survey.

Table 20 – Summary of Cultural Resource Surveys Previously Conducted within 0.5 Miles of the SR 89 R/W Between MP 328.45 and MP 341.92

Project Name	Location	Number of Sites	Reference
US 89 Right-of-Way	MP 328.45 – MP 338.65	2	Spalding et al. (PMDR) 1994
SR 89, Road 3 North and Perkinsville Road	MP 328.95 – MP 329.19	0	Berg (ACS) 1999
Intersection Improvements, SR 89/Perkinsville Rd	MP 329.27 – MP 329.46	1	Fenicle (EcoPlan) 2012
Intersection Improvements, SR 89/Road 4 North	MP 330.46 – MP 330.83	1	Fenicle (EcoPlan) 2012
Addendum Class III Survey for Geotechnical Access	MP 333.00 – MP 333.27	1	Lundin (HDR) 2012
Private Land Adjacent to SR 89	MP 335.19 – MP 335.29	0	Walsh (Entranco) 2001
TCE at Rolling Hills Road and SR89	MP 335.25 – MP 335.30	0	LaFond and Folb (EcoPlan) 2001
SR89 Right-of-Way and Scenic Setback	MP 338.00 – MP 341.92	4	Spalding (PMDR) 1998
Proposed Widening of SR 89 in Paulden	MP 337.00 – MP 338.80	2	Strohmayer (EcoPlan) 2004
Historic Resource Survey of Chino Valley	MP 328.45 – MP 341.92	21	Stein (SWCA) 1995

4.7. Hazardous Materials

Databases maintained by the Arizona Department of Environmental Quality (ADEQ) and US Environmental Protection Agency (EPA) were reviewed to determine the presence of any known hazardous materials sites or areas of concern. One large quantity generator, Performance Automotive Group at 3651 N SR 89, Chino Valley, AZ 86323 was identified in the database search. This site is involved in plating, coating, or anodizing activities, which generate 1,000 kilograms per month or more of hazardous waste or more than one kilogram per month of acutely hazardous waste. This site listing does not indicate any violation, leak, or spill has occurred at this location. Two underground storage tanks (UST) are located at Paulden Park Place at 23310 N SR 89, Paulden, AZ 86334. Two other tanks were removed from this location in 1993. No records of any spills or incidents were identified in the Study Area.

The ADOT Bridge Record indicates that there are six major structures located in the Study Area including the Del Rio Ranch Bridge (MP 333.09), the Big Chino Wash Bridge (MP 335.95), and the Paulden ATSF RR UP bridge (MP 337.38) as well as three major reinforced concrete box (RCB) structures. If any improvements or modification of these structures would occur in future projects, they would require testing to determine if any asbestos-containing materials (ACM) are present. Any modification or demolition of these structures would require the completion and submittal of a National Emission Standards for Hazardous Air Pollutants (NESHAP) notification to ADEQ. If ACM is detected in the structures to be affected, an Asbestos Removal and Disposal Plan for the removal of the material must be completed, approved, and implemented.

Any painted surfaces, including structures and roadway striping, that would be affected by any future projects would require testing to determine if the paint includes lead above regulatory thresholds. If lead is detected in amounts above regulatory limits, appropriate treatment or mitigation would apply.

4.8. Air and Noise

The Study Area is not located within any areas designated by ADEQ as a non-attainment or maintenance area for any criteria pollutant.

The ADOT Noise Abatement Policy and FHWA Noise Abatement Criteria identify the level of allowable traffic noise level for different categories of land use and activities. For homes, churches, schools, and parks, ADOT will consider mitigation for receivers when predicted traffic noise levels are 64 dBA or higher. ADOT will consider mitigation if noise levels are predicted to increase substantially. A substantial noise level increase is equal to or greater than 15 dBA. Within the Study Area, there are numerous residences and several churches. A noise analysis would be required for any future projects which changes the horizontal or vertical alignment of the roadway or adds capacity.

4.9. Socioeconomic Profile

The demographic composition of the Study Area was calculated using the *US Department of Commerce, Bureau of the Census 2010-2014 American Community Survey 5-year estimates*. Population and demographic information is summarized in ***Table 21***. Population data were gathered at the Census Tract level as well as populated places within the Study Area, and

Yavapai County. Census tracts are small, relatively permanent statistical subdivisions of a county for tallying census information and do not cross county boundaries. They are delineated with the intention of being maintained over a long period to allow statistical comparisons from census to census. The size of census tracts varies depending on the population density of the area. The Study Area traverses Census Tracts 2.02, 2.04, and 21, which extend over a much larger area that the Study Area.

According to the US Bureau of Census data the Paulden census-designated place (CDP) has a Hispanic percentage of 29.4%, compared with the overall Study Area percentage of 16.8% and Yavapai County at 13.9%. Census Tract 21 has a higher percentage of people below the poverty level (45.80%) than Yavapai County (16.06%). No substantial protected populations, meaning those populations greater than 50 percent of a population, are located within the Study Area, as summarized in ***Table 22***.

The recently adopted CYMPO Title VI Plan provides provisions for outreach and document translation to limited English proficiency populations, as well as Title VI measures for transportation planning projects.

Table 21 – 2014 Population and Racial Demographics

Area	Total Population	White alone		Black or African American alone		American Indian and Alaska Native alone		Asian alone		Native Hawaiian and Other Pacific Islander alone		Some other race alone		Two or more races		Hispanic or Latino	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
202	8,012	7,536	94.1	11	0.1	189	2.4	34	0.4	0	0.0	111	1.4	131	1.6	688	8.6
204	7,083	6,749	95.3	78	1.1	83	1.2	59	0.8	0	0.0	114	1.6	0	0.0	1,536	21.7
21	2,385	2,063	86.5	12	0.5	8	0.3	0	0.0	0	0.0	173	7.3	129	5.4	717	30.1
All Block Groups	17,480	16,348	93.5	101	0.6	280	1.6	93	0.5	0	0.0	398	2.3	260	1.5	2,941	16.8
Yavapai County	213,689	196,410	91.9	1,188	0.6	4,094	1.9	1,783	0.8	15	0.0	5,529	2.6	4,670	2.2	29,702	13.9
Chino Valley	10,879	10,248	94.2	21	0.2	198	1.8	34	0.3	0	0.0	246	2.3	132	1.2	953	8.8
Paulden	4,909	4,576	93.2	35	0.7	83	1.7	59	1.2	0	0.0	145	3.0	11	0.2	1,442	29.4

Table 22 – Age 60 Years and Over, Below Poverty Level, Disabled, and Female Head of Household Populations									
Area	Total Population	Age 60 Years and Over		Below Poverty Level		Disabled		Female head of Household	
		#	%	#	%	#	%	#	%
202	8,012	2,677	33.4	1196	14.99	1906	23.8	360	10.8
204	7,083	1,841	26.0	1796	25.36	1582	22.3	173	6.3
21	2,385	677	28.4	1086	45.80	393	16.5	69	7.3
All Block Groups	17,480	5,195	29.7	4,078	23.40	3,881	22.2	602	8.6
Yavapai County	213,689	91,531	42.8	33,813	16.06	38,596	18.2	8,524	9.3
Chino Valley	10,879	3,666	33.7	1,890	17.45	2,602	23.9	473	10.7
Paulden	4,909	1,028	20.9	1,305	26.58	1,096	22	175	9.2

4.10. Section 4(f) properties

One Section 4(f) property has been identified near the Study Area. The Chino Valley Community Center Park and Aquatic Center at 1615 North Road 1 East (southeast corner of Perkinsville Road and Road 1 East) is located about 0.35 mile east of SR 89. These public facilities are operated by the Town of Chino Valley Parks and Recreation Department. Potential Section 4(f) properties include the historic properties listed in the Cultural Resources section above.

4.11. Topography and Drainage Features

Study Area topography is shown in ***Figure 15.*** The surrounding topography is fairly mountainous, with SR 89 passing between ranges. In general, there is a low point in the terrain following the Big Chino Wash.

The roadway has a rolling downhill slope, generally less than 1%, from approximately the southern limit of the Study Area to the Big Chino Wash crossing near Little Ranch Road. There are intermittent locations where the grade exceeds 3% throughout the corridor; however, the roadway grade is generally in excess of 3% from the PNF boundary north to MP 341.42. There is a limited segment north of MP 340 that exceeds 6%. Approximate roadway grades are shown in the Map Book in ***Appendix WP1-1***.

Key drainage features are shown in ***Figure 16.*** The National Flood Insurance Program develops Flood Insurance Rate Maps (FIRMs) to indicate the risk of flooding. Map numbers 04025C1315G, Panel 1315 of 3900, effective September 3, 2010; map number 04025C1305G, Panel 1305 of 3900, effective September 3, 2010; and 04025C0990G, Panel 990 of 3900, effective September 3, 2010, cover the Study Area. Based on these maps, the majority of the corridor is located within flood Zone X (unshaded), or areas determined to be outside the 0.2% annual chance floodplain. The areas around the Big Chino Wash are denoted Zone AE, with base flooding elevations determined. FEMA describes these zones as "the floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights." The area adjacent to the Big Chino Wash by SR 89 is Zone X (shaded) and is subject to flooding effects from the Big Chino Wash. Zone X (shaded) denotes, "areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood." There are tributary washes and associated floodways through the valley. There is another floodway crossing north of Road 6N. The PNF is designated Zone D, or "areas in which flood hazards are undetermined, but possible."

Figure 15 – Topography

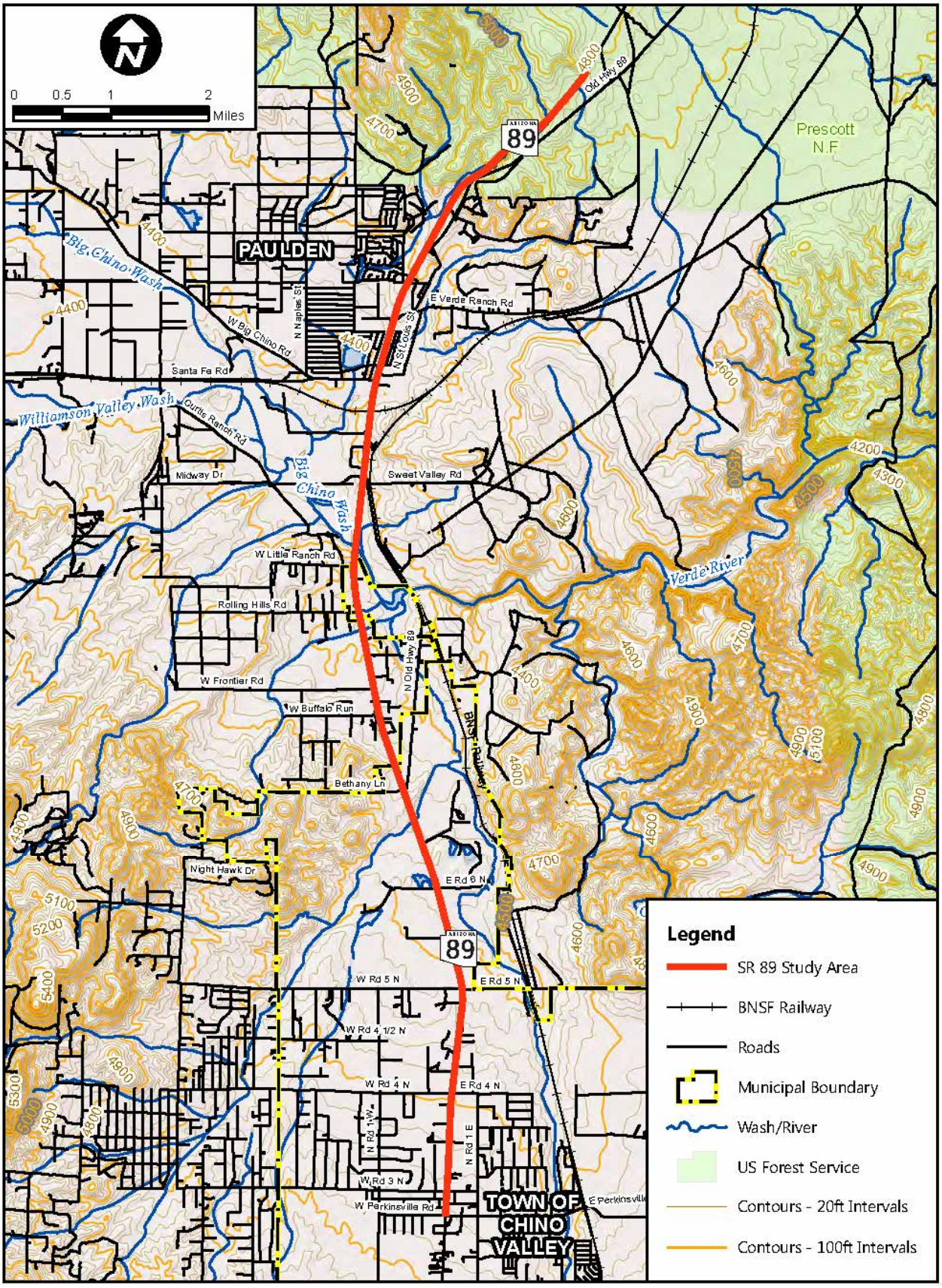
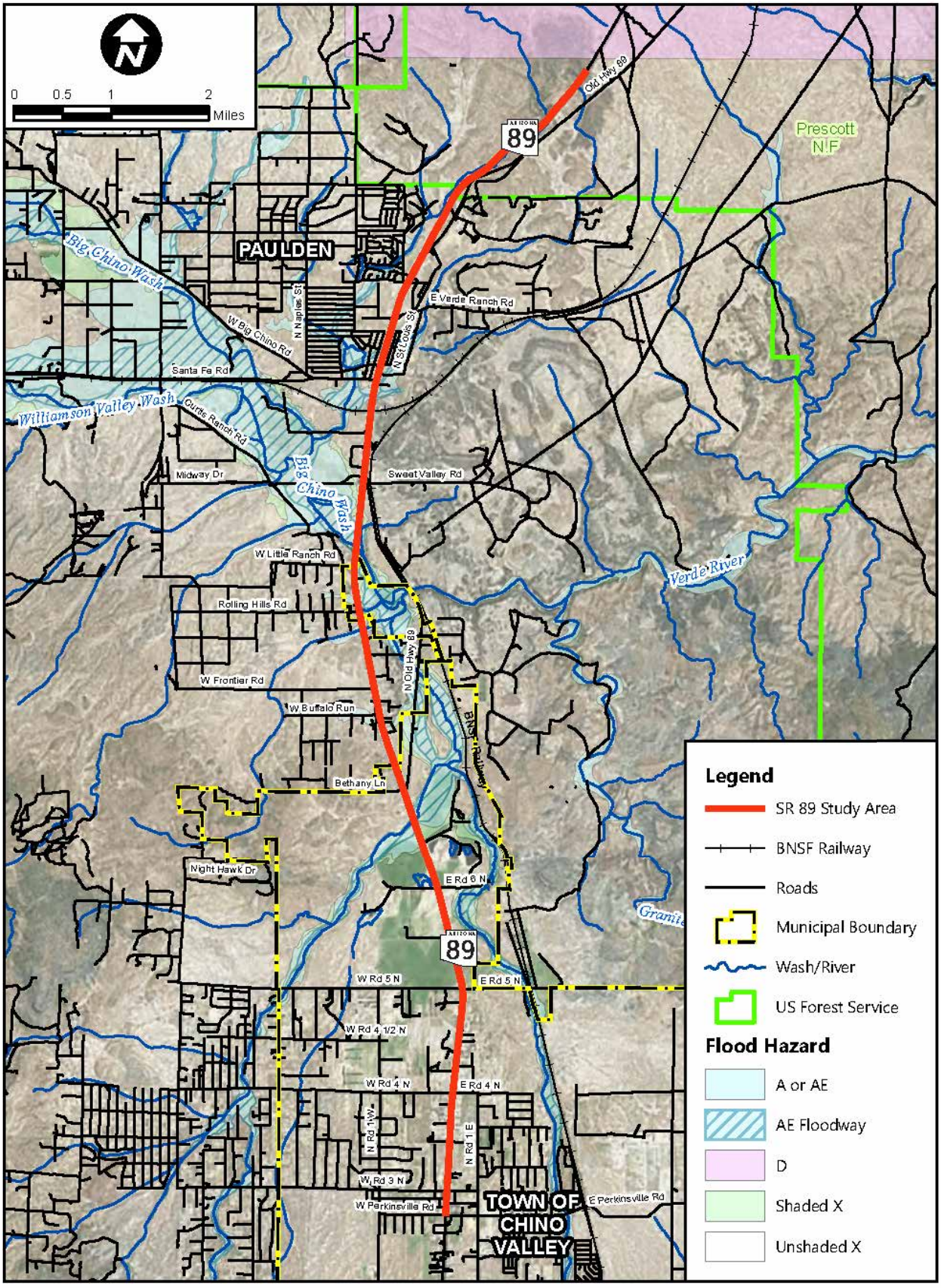


Figure 16 – Drainage Features



5.0 Future Conditions

5.1. Utilities

Based upon available information, there are no planned major utility improvements within the Study Area.

5.2. Transportation Network

5.2.1. Roadway Network

The ADOT State Transportation Improvement Program (STIP) prepared for fiscal years 2016-2020 identifies two future projects within the Study Area. The first project begins near milepost 337 and is programmed for FY 2018. Based upon coordination with ADOT, the project will likely include the construction of two new auxiliary lanes that will serve as right-turn lanes and a continuous left-turn lane from Sweet Valley Road north to the BNSF Railway Bridge (Structure Number 04 1577; MP 337.38). The second project, at MP 338, is programmed for FY 2016; it will construct a northbound right-turn lane at Verde Ranch Road.

5.2.1.1. Climbing Lane

A critical length of grade is achieved between MP 339.98 and MP 340.49. The Green Book identifies three criteria reflecting economic considerations which should be satisfied to justify a climbing lane:

1. Upgrade traffic flow rate in excess of 200 vehicles per hour (vph) and
2. Upgrade truck flow rate in excess of 20 vph and
3. One of the following:
    a. At least a 10 mph speed reduction for heavy trucks or
    b. LOS of E or F on the grade or
    c. A reduction of at least two LOS when moving from the approach segment to the grade

Based on the traffic counts taken near MP 341, the existing upgrade traffic flow rate and truck flow rate are 248 vph and 37 vph, respectively.

The economic justification criteria set forth in the Green Book for a climbing lane is achieved.

5.2.2. Bicycle and Pedestrian Network

There are no known pedestrian specific projects planned along SR 89 within the project area.

The 2015 *AASHTO U.S. Bicycle Route System* evaluated alternatives for the future USBR 79. The recommended route for USBR 79 follows SR 89 from Prescott to I-40.

5.2.3. Transit Network

While the YRT has slowly expanded service since its inception as Chino Valley Transit in 2009, there are currently no published plans for new routes.

5.2.4. Freight Movement

Currently, there are restrictions external to the project limits that likely impact freight traffic along the SR 89 corridor. One such restricting feature is the structurally deficient Hell Canyon Bridge (MP 345.70) which currently has an 80,000 pound limit. A new structure is scheduled to be completed in late 2016 which will eliminate this weight restriction, potentially increasing the freight traffic which passes through the project limits.

5.3. Traffic Analysis

5.3.1. Travel Demand Model Land Use

The 2025 and 2040 model results for the CYMPO focused version of ADOT Statewide Travel Demand Model (AZTDM2) were obtained for use in this study. Socioeconomic data from the models was not reviewed for this study. It was understood that an extensive review and update to the socioeconomic data had just been conducted as part of the 2014 CYMPO Regional Transportation Plan Update reviewed in Section 2.3.

5.3.2. Traffic Forecast and Annual Growth Factor Development

Using the 2025 and 2040 model results, annual growth rates were developed for the SR 89 corridor as well as various cross streets. The following growth rates were used for this Study:

State Route 89
Perkinsville Road to Road 6N – 1.25% per year
Road 6N to Rolling Hills Road – 1.00% per year
Rolling Hills Road to Bramble Drive – 0.85% per year
North of Bramble Drive – 1.40% per year

Road 3N – 1.05% per year
Road 4N – 1.03% per year
Rolling Hills Road – 0.67% per year
Big Chino Road – 0.88% per year
Bramble Drive – 0.43% per year

Existing 2016 traffic count data was increased by the annual growth rate to determine 5-year, 10-year and 20-year forecasts.

5.3.3. Design Hour Volume Factor

Design hour forecasts typically represent the 30th highest hourly volume of the year. Since the 2016 traffic count data were assumed to be taken on an "average" day, a design hour volume factor was developed to convert the counted volume to design hour. From the ADOT 2014 AADT Report, the 30th highest hour on SR 89 in the Study Area represents 9% of the AADT. From the 24-hour counts conducted on the corridor, the PM peak is the highest hour of the day and is between 8.2% and 8.5% of the 24-hour volume. The design hour volume factor is calculated by dividing the average daily peak percentage by the 30th highest hour percentage. For the SR 89 corridor, the design hour volume factor is approximately 1.10. To be a little more conservative, this factor was increased to 1.15. The 2016 AM and PM turning movement counts were

multiplied by 1.15 to convert them to the 30th highest hour design volumes for the traffic operational analysis.

5.3.4. Traffic Operational Analysis

Capacity analyses were conducted for the 5-year, 10-year, and 20-year horizon build conditions at the five intersections identified in ***Figure 11.*** *HCS* software which uses the *Highway Capacity Manual* methodology was used for all intersections, except the intersection SR 89 with Road 4N. This intersection is roundabout; therefore, *SIDRA* software was used to analyze the intersection with *Highway Capacity Manual* methodologies. *HCS* and *SIDRA* results are included in ***Appendices WP1-5 through WP1-7***. ***Table 23***, ***Table 24***, and ***Table 25*** summarize the 2021, 2026 and 2036 AM and PM peak hour capacity analysis results, respectively.

Table 23 – 2021 AM and PM Peak Hour Capacity Analysis

Intersection*	Approach	2021 AM Peak		2021 PM Peak	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Intersection 1 SR 89 & Road 3N	Eastbound	D	37.6	D	41.1
	Westbound	D	36.6	D	41.2
	Northbound	B	10.9	A	9.2
	Southbound	B	14.7	B	11.8
	Overall	**C**	**20.2**	**B**	**15.6**
Intersection 2 SR 89 & Road 4N	Eastbound	A	6.4	A	5.5
	Westbound	A	5.2	A	7.2
	Northbound	A	5.3	A	7.9
	Southbound	A	7.2	A	6.4
	Overall	**A**	**6.4**	**A**	**7.2**
Intersection 3 SR 89 & Rolling Hills Road	Eastbound	B	13.4	B	13.1
	Northbound	A	1.1	A	0.5
	Southbound	A	0.0	A	0.0
	Overall	**A**	**1.4**	**A**	**0.8**
Intersection 4 SR 89 & Big Chino Road	Eastbound	B	13.4	C	17.4
	Northbound	A	2.2	A	3.9
	Southbound	A	0.0	A	0.0
	Overall	**A**	**5.2**	**A**	**4.4**
Intersection 5 SR 89 & Bramble Drive	Eastbound	A	9.4	B	12.0
	Westbound	B	11.6	C	18.6
	Northbound	A	0.9	A	3.6
	Southbound	A	0.0	A	0.3
	Overall	**A**	**3.8**	**A**	**3.4**

*Refer to ***Figure 11*** for intersection number.

Table 24 – 2026 AM and PM Peak Hour Capacity Analysis					
Intersection*	**Approach**	**2026 AM Peak**		**2026 PM Peak**	
		LOS	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
Intersection 1 SR 89 & Road 3N	Eastbound	D	36.6	D	40.4
	Westbound	D	36.4	D	40.6
	Northbound	B	11.5	B	10.2
	Southbound	B	15.7	B	13.1
	Overall	**C**	**20.6**	**B**	**16.5**
Intersection 2 SR 89 & Road 4N	Eastbound	A	6.6	A	5.7
	Westbound	A	5.3	A	7.4
	Northbound	A	5.4	A	8.2
	Southbound	A	7.5	A	7.4
	Overall	**A**	**6.7**	**A**	**7.5**
Intersection 3 SR 89 & Rolling Hills Road	Eastbound	B	13.7	B	13.5
	Northbound	A	1.0	A	0.4
	Southbound	A	0.0	A	0.0
	Overall	**A**	**1.4**	**A**	**0.8**
Intersection 4 SR 89 & Big Chino Road	Eastbound	B	13.7	C	18.4
	Northbound	A	2.1	A	3.9
	Southbound	A	0.0	A	0.0
	Overall	**A**	**5.1**	**A**	**4.4**
Intersection 5 SR 89 & Bramble Drive	Eastbound	A	9.5	B	12.1
	Westbound	B	12.1	C	18.9
	Northbound	A	1.2	A	3.6
	Southbound	A	0.0	A	0.2
	Overall	**A**	**3.8**	**A**	**3.4**

*Refer to ***Figure 11*** for intersection number.

Table 25 – 2036 AM and PM Peak Hour Capacity Analysis					
Intersection*	**Approach**	**2036 AM Peak**		**2036 PM Peak**	
		LOS	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
Intersection 1 SR 89 & Road 3N	Eastbound	D	36.5	D	40.9
	Westbound	D	35.5	D	39.4
	Northbound	B	12.7	B	11.2
	Southbound	B	17.9	B	14.9
	Overall	**C**	**21.7**	**B**	**17.6**
Intersection 2 SR 89 & Road 4N	Eastbound	A	7.2	A	6.0
	Westbound	A	5.8	A	8.1
	Northbound	A	5.7	A	9.2
	Southbound	A	8.6	A	7.2
	Overall	**A**	**7.4**	**A**	**8.3**
Intersection 3 SR 89 & Rolling Hills Road	Eastbound	B	14.3	B	14.2
	Northbound	A	1.0	A	0.5
	Southbound	A	0.0	A	0.0
	Overall	**A**	**1.5**	**A**	**0.8**
Intersection 4 SR 89 & Big Chino Road	Eastbound	B	14.7	C	21.0
	Northbound	A	2.3	A	4.1
	Southbound	A	0.0	A	0.0
	Overall	**A**	**5.6**	**A**	**4.8**
Intersection 5 SR 89 & Bramble Drive	Eastbound	A	9.5	B	12.7
	Westbound	B	12.3	C	20.7
	Northbound	A	1.1	A	3.6
	Southbound	A	0.0	A	0.2
	Overall	**A**	**3.8**	**A**	**3.2**

*Refer to ***Figure 11*** for intersection number.

The analysis indicates the operations for 5-year, 10-year, and 20-year horizon build conditions at the five intersections are very good at overall LOS A or LOS B, except for the SR 89 and Road 3N intersection that will operate at LOS C during the AM peak hour under all build conditions. The minor road approaches at this intersection operate at an acceptable LOS D, which is typical of minor approaches at signalized intersections with substantially lower volumes than the mainline (SR 89). Even with the projected growth in the area, the five Study Area intersections are expected to have acceptable intersection operations through at least 2036 without any geometric or capacity improvements.

6.0 Identified Needs Summary

Working Paper 1 reviewed pertinent current and projected future information for the Study Area. Transportation issues, opportunities, and constraints were outlined; recommendations from previous studies were documented. Based on a review of this information, the following transportation needs and deficiencies were identified.

6.1. Safety

Working Paper 1 identified a need to address safety within the Study Area. Within the five year period from November 30, 2010 to November 30, 2015, there have been over 200 crashes reported with three fatalities within the analysis period; one fatality occurred after the analysis period. The corridor has two distinct character areas where the crash patterns differ.

- South of Road 5N (developed), the top three types of crashes include rear end, left turn, and sideswipe (same direction). Crashes were generally clustered around intersections. The top five locations, from south to north, include the intersections at Perkinsville Road, Palomino Road, Road 3N, Road 4N, and Road 5N. The Perkinsville Road and Road 4N intersections were recently reconstructed as roundabouts, which is anticipated to address safety concerns at these locations. The intersections at Palomino Road, Road 3N, and Road 5N, along with other locations, should be considered for safety related improvements.
- North of Road 5N (less developed), the top three types of crashes include fixed object, rear end, and animal. Crashes were generally clustered around intersections, with various intermittent crash locations throughout. The four fatalities reported in the Study Area occurred in this segment, where three of the four occurred at intersections. In addition to the intersections, clusters of crashes occur just south of the Del Rio Ranch Bridge (near MP 333), between Little Ranch Road and the Big Chino Wash Bridge (MP 335.7 to 336.2), and near the development just south of the BNSF Railway bridge (MP 337.0). In general, there is a need to reduce the number of single vehicle and nighttime collisions.

6.2. Access Management

There is a need to address connection (access point) density, location, and type within the Study Area. An access management plan needs to be developed to guide corridor development now and in the future. Provisions for access management for future development should also be considered.

6.3. General Considerations

Additional general considerations should include accommodating the presence of truck traffic and environmental concerns with potential corresponding mitigation measures for potential improvements.

7.0 Corridor Vision and Access Management

A long-term corridor vision, extending beyond the 20-year planning horizon of this study, was developed to accommodate buildout growth and to integrate access management. Components of this vision should generally be completed as needed, to accommodate future development as it occurs. The corridor vision can be divided in four segments:

- Perkinsville Road to Road 5N;
- Road 5N to Sweet Valley Road;
- Sweet Valley Road to Bramble Drive; and
- Bramble Drive north to study limit.

Access management will protect the investment in the corridor by reducing travel times, improving corridor aesthetics, and enhancing future facility performance. Access management typically reduces the number of conflict points, and in turn, the number of crashes. In general, medians are proposed through much of the corridor to promote right-in right-out access; roundabouts are proposed at key locations to provide left- and U-turn movements. The roadway typical sections, locations for major intersections, and other features were developed in consideration of existing and anticipated development patterns.

The following corridor vision should guide development along the corridor; however, there could be another approach if parallel roads develop, requiring fewer full access intersections.

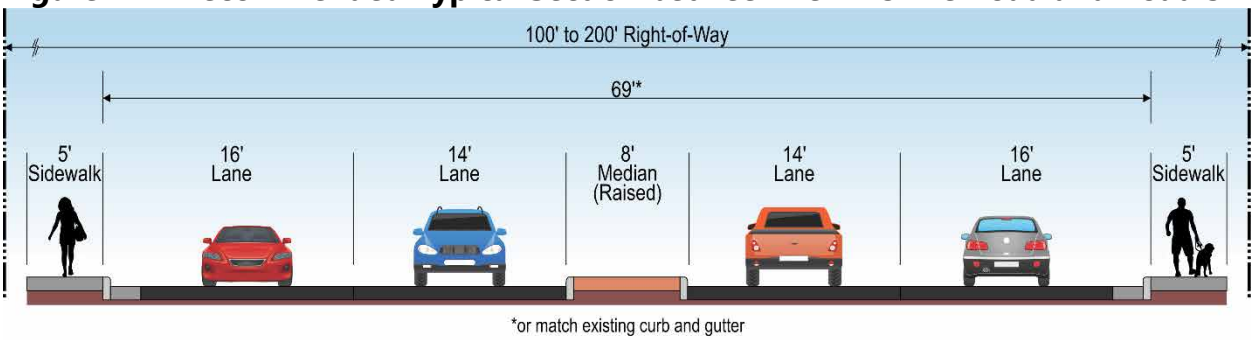
7.1. Perkinsville Road to Road 5N (MP 329.20 to 331.28)

Perkinsville Road to Road 5N is entirely within Chino Valley and is more densely developed than the rest of the corridor. Based upon existing development, a four-lane facility with an eight-foot wide raised median, curb, gutter, and sidewalk is recommended, as shown in ***Figure 17***. The typical section should utilize the existing curb and gutter south of Road 3N (approximate 71-foot width); the typical section north of 3N could either match the section south of Road 3N or narrow the median as shown in ***Figure 17***. The best approach should be determined during final design. This generally conforms to the Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT Roadway Design Guidelines (RDG), modified with a narrower median and sidewalks.

Roundabouts are recommended at major intersections in this segment to accommodate left- and U-turn movements. Major intersections include the existing roundabouts at Perkinsville Road and Road 4N and a proposed roundabout at Road 5N. Current site constraints provide challenges to constructing a roundabout at Road 3N. Partial access (e.g. ¾ access) at Road 3N may be considered; however, the Town Fire District is located just west of the intersection and there are concerns regarding emergency response for the eastbound to northbound left-turn movement. Access at Road 3½N may be full or partial access, based upon future development and ADOT discretion. There is an opportunity to balance future improvements at Road 3N and Road 3½N, where one could potentially accommodate turning movements that would typically occur at the other location. The ultimate build out of the Road 3N and Road 3½N intersections

should be determined by corridor needs, development patterns, and engineering and construction considerations.

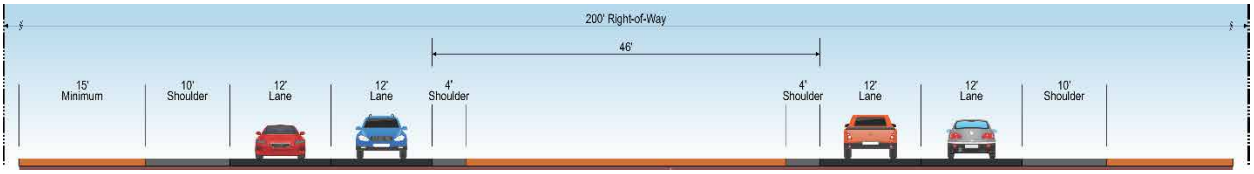
Figure 17 – Recommended Typical Section between Perkinsville Road and Road 5N



7.2. Road 5N to Sweet Valley Road (MP 331.28 to 336.69)

Road 5N to Sweet Valley Road includes the northern limit of Chino Valley and ends south of the Paulden Post Office. Based upon existing and planned development density, a four-lane facility conforming to the Fringe-Urban Highway Typical Section IS3 as shown in Figure 306.3 of the ADOT RDG is recommended in this segment as shown in ***Figure 18***. It is a four-lane divided highway (bifurcated highway) with rural characteristics. Roundabouts that accommodate left- and U-turn movements are recommended at major intersections within this segment, including Old Highway 89, Frontier Road, Rolling Hills Road, Little Ranch Road, and Sweet Valley Road.

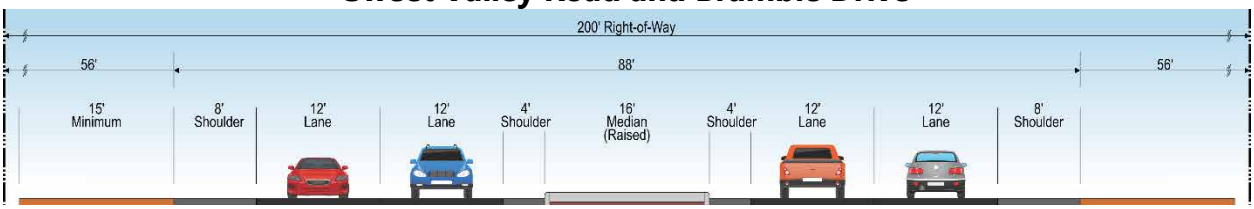
Figure 18 – Recommended Typical Section between Road 5N and Sweet Valley Road



7.3. Sweet Valley Road to Bramble Drive (MP 336.69 to MP 338.80)

Sweet Valley Road to Bramble Drive includes downtown Paulden; Bramble Drive is the northern-most intersection before the PNF. Based upon existing and planned development density, a 4-lane facility with a 16-foot wide concrete raised median conforming to the Fringe-Urban Highway Typical Section IS1 as shown in Figure 306.3 of the ADOT RDG is recommended as shown in ***Figure 19***. Roundabouts are recommended at major intersections within this segment, including Big Chino Road and Bramble Drive. In order to accommodate a four-lane section, the BNSF Railway bridge would need to be widened.

Figure 19 – Recommended Typical Section between Sweet Valley Road and Bramble Drive



ADOT Fringe Urban Typical Section with Raised Concrete Median

7.4. Bramble Drive North (MP 338.80 to 341.42)

The PNF boundary is less than one mile north of Bramble Drive. Little through traffic is anticipated in this section, therefore the existing two-lane road should be sufficient to accommodate traffic demand. No median is necessary as there are very limited access points.

7.5. Access Management Guidelines

ADOT is currently developing Access Management Guidelines. The draft ADOT guidelines and/or guidelines from the Transportation Research Board (TRB) *Access Management Manual* (2014) should be considered when permitting new access points.

Reducing the number of new/existing access points is an effective tool to reduce the number of conflict points. A disposition of access for each access point was not conducted. All parcels require an access point; however, when possible, the following criteria should be met for new access points on SR 89:

- Side street/cross street access is used in lieu of SR 89 if available.
- Meets access spacing requirements (see Section 3.7.1.3).
- Is not located within a turn lane to another public street or a private driveway.

When practicable, unused or redundant access points could be removed as parcels develop/redevelop. This includes limiting new development to one connection per parcel to SR 89 whenever possible.

8.0 Potential Improvement Strategies

After the Draft Working Paper 1 was prepared, the second Study Team meeting was held. The group developed potential improvement strategies that would blend with the long-term vision, minimize "throw away" infrastructure considering the corridor vision, and address the identified needs.

Safety countermeasures were identified that may improve safety performance by focusing on the crash types having the greatest potential for mitigation. Improvements were investigated to accommodate access management and growth needs. Intersection improvements were only investigated for intersections with public roads.

8.1. Safety Analyst Analysis

The ADOT Traffic Safety Section utilized Safety Analyst to analyze the corridor. The following recommendations stemmed from this analysis:

- Strong need for access management due to high rear-end crashes in urban areas.
- Reduce the high number of run-off road / fixed object crashes in rural areas.
- There is a need for appropriate wildlife fencing.
- Implement wildlife crossing signage (especially between MP 334 – 342).

These recommendations were considered when developing the potential improvements summarized below. Potential improvements were combined into logical projects and are illustrated in the Recommendations Map Book in ***Appendix WP2-1***.

The ADOT Traffic Safety Section suggested non-engineering safety improvements. Four behavioral traits from the Strategic Highway Safety Plan (SHSP) to include in a safety campaign targeting this corridor may include Slow Down, Buckle Up, Pay Attention, and Drive Sober.

8.2. Perkinsville Road to Road 5N (MP 329.20 to 331.28)

This segment is more urbanized than the northern portion of the corridor. Potential treatments were developed to address existing access management and safety concerns; specifically, to reduce the number of conflict points at driveways and intersections. The potential treatment from Perkinsville Road to Road 5N includes constructing Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT Roadway Design Guidelines (RDG), modified with an eight-foot wide median and includes sidewalks. If funding is available, a 16-foot wide median could be considered. Where left-turn lanes are provided, they should be sized to accommodate the gap, braking distance, and queue within the median. There is a development platted between Road 3N and Road 3½N; a widened roadway section with a divided median will accommodate anticipated future demand and promote access management. It is anticipated that some type of access will be necessary at Road 3½N; the type of access (e.g. ¾ access or full access) will be determined based upon future development and ADOT discretion. There are underdeveloped parcels between Road 4N and Road 5N; should their use intensify, a widened roadway section with a divided median will accommodate future development and promote access management.

A raised median is inconsistent with the adjoining section of SR 89 from Road 1S to Perkinsville Road, where there is four-lane section with a two-way left-turn lane (TWLTL). However, a two-way left-turn lane is not recommended in this segment due to the high number of access points.

Roundabouts are generally recommended at primary intersections within the Study Area; Road 3N is an exception due to current constraints at the intersection. It is recommended that the traffic signal remain and that a protected left-turn phase be added to mitigate the number of crashes at the intersection as a short-term solution. This approach satisfies stakeholder concerns regarding the eastbound to northbound left-turn movement at this intersection. This countermeasure investigated a 100 second cycle for both peaks with a protected-permitted southbound left-turn, protected only northbound left-turn and permitted only eastbound and westbound left-turns. If this counter measure underperforms, the intersection should be reevaluated in the future. Other treatments, such as a roundabout or ¾ access, may be effective.

A roundabout was considered at Road 5N to provide a U-turn movement and to accommodate existing and planned development in the area. The roadway typical section would taper to one lane in each direction north of this roundabout.

The following summarizes potential treatments within the planning horizon and their primary purpose. Note that safety improvements were developed to address fatal and incapacitating crashes, as well as less severe crashes.

- Perkinsville Road to Road 5N (MP 329.00 to MP 331.27) – Construct raised median and four-lane typical section between Road 3N and Road 5N (safety, access management, and accommodate future development).
- Road 3N (MP 329.20) – Add protected left-turn phase to existing signal (safety).
- Road 5N (MP 331.27) – Construct a two-lane roundabout (safety and access management).

The raised median and four-lane typical section could be constructed in two phases based upon funding availability. Perkinsville Road to the existing roundabout at Road 4N would be a logical first phase.

8.3. Road 5N to Sweet Valley Road (MP 331.28 to 336.69)

Potential improvements in this segment evaluated within the planning horizon were developed to ease existing and anticipated safety and access concerns. Currently, the approaches for Road 6N do not align; modifying this intersection was evaluated to improve access management. The TRB *Access Management Manual* (2014) recommends access points should align or be offset enough to create two clearly identifiable intersections; examples cited provided an offset of 600 to 750 feet with the posted or design speed over 45 mph. The intersection at Road 6N is offset by approximately 70 feet.

This segment includes several private roads and driveways where crashes have occurred within the past five years. The highest concentration of crashes in this segment is at Buffalo Run Road; these crashes are predominately rear end collisions, with one angle crash. A four-lane divided highway (bifurcated highway) conforming to the Fringe-Urban Highway Typical Section IS3 as

shown in Figure 306.3 of the ADOT RDG and ***Figure 18*** herein was considered between Old Highway 89 and Frontier Road, with two-lane roundabouts at each end to accommodate U-turn and left-turn movements. A northbound left-turn lane and a southbound right-turn lane were investigated at Little Ranch Road.

The following summarizes potential treatments within the planning horizon and their primary purpose. Note that safety improvements were developed to address fatal and incapacitating crashes, as well as less severe crashes.

- Road 6N (MP 332.35) – realign Road 6N approaches to SR 89 (access management).
- Construct divided median and four-lane typical section between Old Highway 89 and Frontier Road (access management, safety, and accommodate future development).
- Old Highway 89 (MP 333.41) – construct two-lane roundabout (access management).
- Frontier Road (MP 334.50) – construct two-lane roundabout (access management).
- Little Ranch Road (MP 335.77) – construct northbound left-turn lane (safety).

8.4. Sweet Valley Road to Bramble Drive (MP 336.69 to MP 338.80)

ADOT is currently developing a project between Sweet Valley Drive and the BNSF Railway overpass; it has been excluded from this analysis. No geometric improvements are being investigated within this segment as the project under development should address current needs; however, this study evaluated lighting at the Paulden Post Office. A cluster of crashes has occurred near the post office during the five year analysis period; a high percentage of these crashes occurred at night when compared to the statewide average. Further, there was an incapacitating crash involving a pedestrian. There is development on both sides of SR 89 near the post office, which lends itself to pedestrian crossings. If lighting is installed, an agreement with ADOT would be required, indicating that an improvement district or the local government would fund electricity and potentially installation. ADOT would typically maintain the lighting system.

North of the BNSF Railway overpass, existing development is limited; however, there is a large development platted east of Big Chino Road and commercial developments are underway. A roundabout was investigated at this location to accommodate future development and access management needs.

There is a concentration of crashes at Bramble Drive, including a fatal and incapacitating crash. A roundabout was investigated to mitigate crashes and for access management.

The following summarizes potential treatments within the planning horizon and their primary purpose(s). Note that safety improvements were developed to address fatal and incapacitating crashes, as well as less severe crashes.

- Paulden Post Office (MP 337.05) – install lighting (safety).
- Big Chino Road (MP 337.70) – construct roundabout (access management, future development, and safety).
- Bramble Drive (MP 338.80) – construct roundabout (safety and access management).

8.5. Bramble Drive to Study Limit (MP 338.80 to 341.42)

No infrastructure improvements were evaluated within this segment. The existing facility has adequate capacity through the planning horizon and almost all of the crashes in this segment are run off the road or animal collisions. Wildlife warning signage installation was investigated in accordance with the recommendations of the ADOT Statewide Wildlife Crash Analysis and Proposed Action Plan. Costs for signage were only developed within the Study Area. The following summarizes potential treatments within the planning horizon:

- MP 334.0 to study limit (and beyond) – install wildlife warning signage (safety).

8.6. Revised Project Concepts

The project concepts were refined after review and input from the Study Team, stakeholders, and the public. A summary of revisions includes:

- Two options for Perkinsville Road to Road 3N:
  - Construct the raised median north of Butterfield Road to the existing traffic signal at Road 3N. Butterfield Road should keep full access to SR 89.
  - Should a roundabout be constructed at Road 3N, construct the raised median north of Perkinsville Road, converting Butterfield Road to a right-in right-out access point.
- Construct a southbound right-turn lane at Little Ranch Road (MP 335.77).
- Construct roundabouts with a two-lane circulatory road. Big Chino Road and Bramble Drive will be constructed as two-lane roundabouts (MP 337.70 and MP 338.80).
- Provide a northbound two-lane section north of the Bramble Drive roundabout to provide a passing opportunity in lieu of a passing lane further north. This was assessed as part of the roundabout project, including impacts and cost.

The section between Perkinsville Road and Road 3N is currently a four-lane section with a TWLTL. Two potential approaches were identified: 1.) Construct a median from Perkinsville Road to Road 3N and provide a roundabout at Road 3N; or 2.) Retain the existing TWLTL from Perkinsville Road through the Butterfield Road intersection, construct a median north of Butterfield Road to Road 3N and retime the existing traffic signal. Either solution could be paired with the improvements described for Road 3N to 5N. As the latter solution is less costly and the signal at Road 3N is performing sufficiently, constructing a median north of Butterfield Road and retiming the existing traffic signal is currently recommended. The roundabout at Road 3N is included in the safety analysis.

8.7. Design Considerations

A Recommendations Map Book was developed to illustrate improvements considered within the planning horizon and to serve as the basis for potential probable cost estimates, included as ***Appendix WP2-1***. The following design assumptions were used in its development:

- Roundabouts were designed to accommodate two WB-67 trucks side by side.
- 55 mph design speed south of 5N.

- 65 mph design speed north of 5N, with the exception of the taper approaching the Big Chino Road roundabout. The roundabout was configured based upon the 65 mph design speed; however, a 65 mph design speed taper extends under the BNSF railway bridge, which is too narrow to accommodate the taper. Therefore, shifting the roundabout location or adjusting the taper design speed to 55 mph should be considered.
- Based upon conceptual engineering, existing culverts near Road 3 ½ N and Frontier Road will need to be extended to accommodate improvements. These costs are included in the project contingency.
- The existing power poles within the right-of-way and near the edge of the proposed typical section will be relocated within the existing right-of-way, five feet from its outside edge (barring other utility conflicts), by the utility owner (no associated project cost).

8.8. Estimate of Probable Cost

Estimates of probable cost were developed for the potential improvements to provide an "order of magnitude" cost. These costs were developed utilizing 2016 dollars and are based on the general description of the potential improvement provided. Potential right-of-way costs are not included in the estimates. Right-of-way needs should be minimal except for a roundabout at Road 3N and realigning Road 6N. Planning level cost estimates considered the following factors:

- Construction items, such as pavement, earthwork, and traffic control;
- Administrative items, such as design, construction and engineering administration, and quality control; and
- Contingencies, including unidentified items (30%) and construction (5%).

Currently, the Arizona Highway Safety Improvement Program (HSIP) application indicates that if more than one countermeasure (improvement) is being installed, the cost of each countermeasure must be developed separately. In order to facilitate a high-level review of project components through that lens, the cost and safety benefits for each countermeasure are evaluated independently in this working paper. Project recommendations will combine countermeasures into logical, constructible projects.

As improvements advance in the project development process, more detailed project cost estimates that consider specific existing site conditions, such as topography and right-of-way constraints, will need to be developed.

Planning level cost estimates in 2016 dollars are presented ***Appendix WP2-2*** and summarized in ***Table 26***. The costs were developed with the following assumptions:

Corridor-wide:

- All existing pavement is removed at roundabout locations.
- Earthwork estimates are based on $8 per cubic yard.
- Work limits match shaded area in Recommendations Map Book.

Perkinsville Road to Road 3N:

- Existing curb and gutter remain.
- Raised median pavement sits on compacted subgrade.
- Mill and overlay existing pavement; full depth replacement within the saw cut where no median is placed.

Road 3N to Road 5N:

- 69-foot typical section with new curb and gutter. Final typical section (69-foot or match existing width south of Road 3N) to be determined during project design.
- Shoulders are full-depth pavement construction.
- All existing pavement removed and replaced with full depth section.
- Raised median pavement sits on compacted subgrade.

North of Road 5N:

- All existing pavement is removed for widening, full depth replacement is required.

Little Ranch Road:

- Improvements extend north to Big Chino Wash Bridge to avoid short stretch of "old" pavement.

Table 26 – Estimate of Probable Cost

Location	Potential Improvement	Cost
Butterfield Road to Road 3N	Replace TWLTL with raised median north of Butterfield Road	$490,000
Road 3N	Retime existing signal	N/A*
Road 3N	Roundabout	$2,010,000
Road 3N to Road 4N	Widen to 4-lane section with raised median	$5,890,000
Road 4N to Road 5N	Widen to 4-lane section with raised median	$5,650,000
Road 5N	Roundabout	$2,730,000
Road 6N	Align intersection	$480,000
Old Highway 89	Roundabout	$4,360,000
Old Highway 89 to Frontier Road	Widen to 4-lane section with raised median	$5,070,000
Frontier Road	Roundabout	$3,760,000
Little Ranch Road	Construct left-turn lane	$1,270,000
Little Ranch Road	Construct right-turn lane	$150,000
Paulden post office	Lighting	$90,000
Big Chino Road	Roundabout	$4,540,000
Bramble Drive	Roundabout	$5,100,000
MP 343-341.42	Install wildlife warning signage	$3,000**

*Assumes this project will be completed by ADOT staff.
**$500 allowance per sign, 3 signs in the both the north and southbound directions.

8.9. Other Considerations

The project study team presented additional thoughts, concerns, and considerations for project development through the corridor. This input is summarized below.

- ***Truck climbing lane*** (MP 339.98-340.49) – the economic justification criteria set forth in the AASHTO *A Policy on Geometric Design of Highways and Streets* ("Green Book") for a climbing lane is achieved in this segment; however, based upon stakeholder input, extending two northbound lanes north of the Bramble Drive roundabout would provide a more cost effective passing opportunity.
- ***Wildlife accommodations*** – future projects should consider antelope wire for fencing. In addition, eagles have been spotted near Road 6N.
- ***Pavement condition*** –the existing pavement near the Drake Cement Plant was noted to be in poor condition; however, the plant is beyond limits of this study.

9.0 Traffic Analysis

Capacity analysis was conducted for the proposed improvements at the five study intersections identified in Working Paper 1, shown in ***Figure 20***. *HCS* software, which uses the *Highway Capacity Manual* methodology, was used for the signalized intersection at Road 3N and the stop controlled intersection at Rolling Hills Road. *SIDRA* software was used to analyze the roundabouts at Road 4N, Big Chino Road, and Bramble Drive. *HCS* and *SIDRA* results are included in ***Appendix WP2-3***. Roundabout analysis for Big Chino Road and Bramble Drive indicates a one-lane roundabout would perform adequately through the planning horizon; however, based on stakeholder input, the two-lane buildout configuration was used for project development, including the schematic and project cost estimate.

Figure 20 – Intersections Considered in Analysis

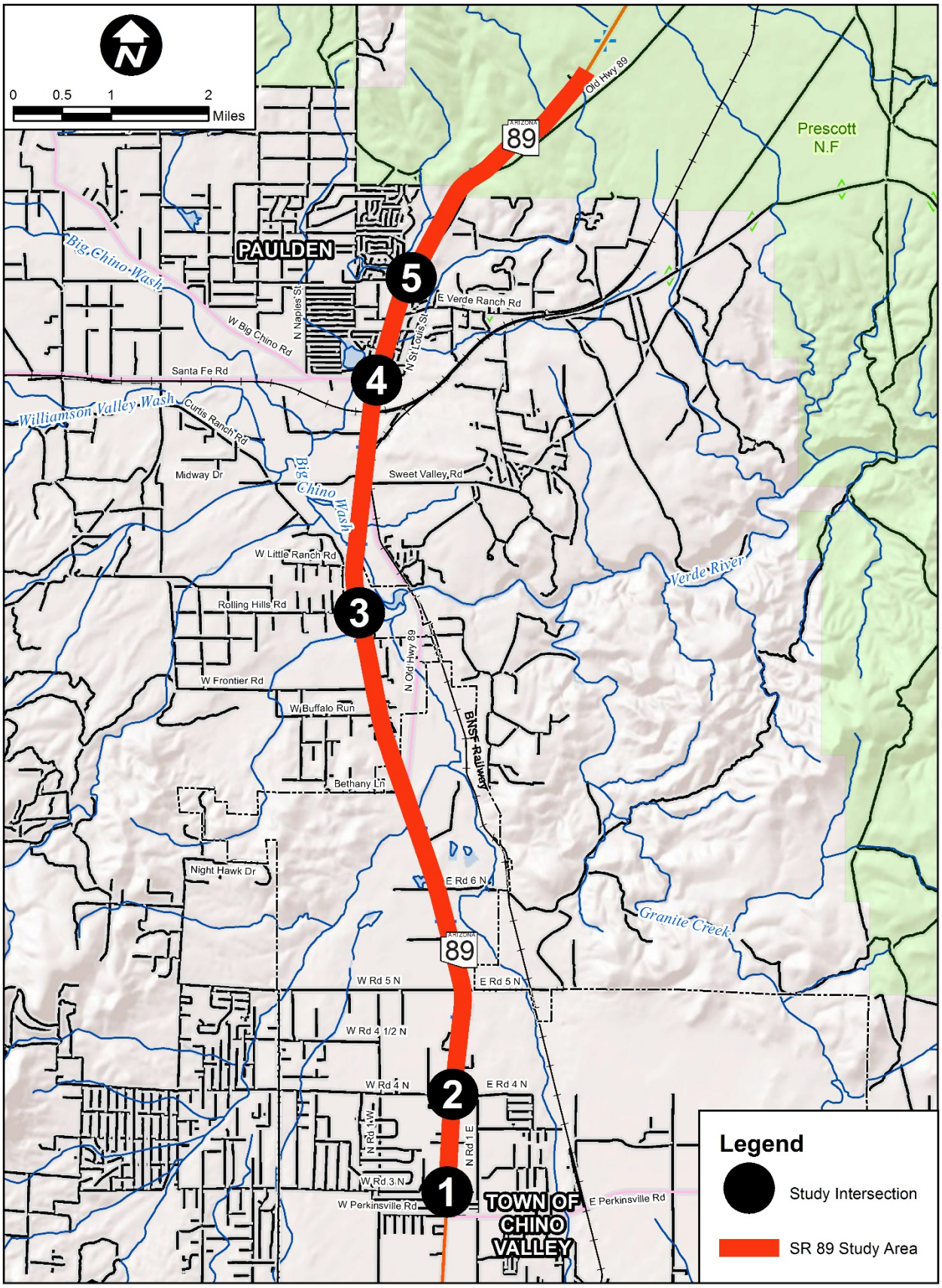


Table 27 summarizes the 2036 AM and PM peak hour capacity analysis results. Only the 2036 (20-year horizon) build conditions were analyzed.

Table 27 – 2036 AM and PM Peak Hour Build Capacity Analysis

Intersection*	Approach	2036 AM Peak		2036 PM Peak	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Intersection 1 SR 89 & Road 3N	Eastbound	D	35.5	D	42.4
	Westbound	D	35.2	D	39.8
	Northbound	C	21.0	C	20.6
	Southbound	B	19.4	C	21.6
	Overall	**C**	**24.4**	**C**	**24.7**
Intersection 2 SR 89 & Road 4N	Eastbound	A	7.2	A	6.0
	Westbound	A	5.8	A	8.1
	Northbound	A	5.7	A	9.2
	Southbound	A	8.6	A	7.2
	Overall	**A**	**7.4**	**A**	**8.3**
Intersection 3 SR 89 & Rolling Hills Road	Eastbound	B	14.3	B	14.2
	Northbound	A	1.0	A	0.5
	Southbound	A	0.0	A	0.0
	Overall	**A**	**1.5**	**A**	**0.8**
Intersection 4 SR 89 & Big Chino Road	Eastbound	A	8.5	A	6.8
	Northbound	A	5.8	B	10.7
	Southbound	A	6.7	B	10.8
	Overall	**A**	**7.0**	**B**	**10.2**
Intersection 5 SR 89 & Bramble Drive	Eastbound	A	4.9	A	5.8
	Westbound	A	4.3	A	4.6
	Northbound	A	5.2	A	6.2
	Southbound	A	4.2	A	8.0
	Overall	**A**	**4.9**	**A**	**7.0**

*Refer to ***Figure 20*** for intersection number.

The analysis indicates the five study intersections will operate acceptably through 2036 with LOS C or better. Depending on signal optimization at Road 3N, the eastbound and westbound LOS could be better than indicated as vehicles making a northbound left-turn could make the left-turn movement at the Perkinsville Road roundabout to avoid congestion and use Road 1W as a parallel route.

Beyond the planning horizon, the roundabouts at Big Chino Road and Bramble Drive are proposed to be converted into multilane roundabouts to accommodate the four-lane build out corridor vision. Because these intersections operate at LOS B or better under 2036 conditions with a one-lane roundabout, a multilane roundabout is expected to operate acceptably well into the future with minimal delays.

10.0 Potential Improvement Safety Analysis

The safety benefit of the potential improvements was evaluated by using Crash Modification Factors (CMF)s available thought the Highway Safety Manual (HSM) and FHWA CMF Clearinghouse. A CMF is a multiplicative factor that indicates the proportion of crashes that would be expected after implementing a countermeasure. CMFs provide a quantitative estimate of the effectiveness of a safety countermeasure. CMFs with a value less than 1.0 indicate an expected decrease in crashes, while those greater than 1.0 indicate an expected increase. When combined with probable constructions costs and costs associated with differing crash severities, CMFs provide a basis for cost-benefit analysis.

The safety analysis for this corridor used the five-year crash history, and was not normalized using HSM predictive analysis. Predictive analysis serves to adjust crash data to a "typical year," reducing fluctuations in annual crash rates prior to analysis. A fatal crash was reported at Little Ranch Road after the original analysis period (2010-2015), as described in Working Paper 1. While not included in the original crash analysis, this crash was included as part of the benefit to cost ratio analysis as there are high costs associated with fatal crashes and this crash would be included in any potential funding application. Crashes with impaired drivers were not removed from analysis; however, these crashes cannot be considered to support an application for HSIP funding.

Not all CMFs can be applied to all crash types; for instance, lighting an intersection will not reduce daytime crashes. The raised median was not assumed to address crashes at Perkinsville Road, Road 4N, Road 5N, Old Highway 89, or Frontier Road. Constructing a raised median for the segment from Perkinsville Road to the end of the existing four-lane section has been evaluated separately from the transition to the two-lane section to Road 4N because the existing roadway section differs (four-lane with two-way left-turn lane vs. two-lane), so one CMF cannot be applied to both sections. The CMFs have been used as applicable for this analysis. An applicable CMF is not available for all of the potential improvements recommended within this corridor, e.g. installing wildlife signage. The potential safety benefit of these improvements was not quantified.

The safety analysis of potential improvements is shown in ***Table 28*** and ***Table 29***. These tables use the KABCO injury classification scale, with the following values:

- K – Fatal Injury
- A – Incapacitating Injury
- B – Non-incapacitating Evident
- C – Possible Injury
- O – No Injury

A footnote is provided with a link to the CMF used in the analysis; details for the CMFs are provided in ***Appendix WP2-4***.

Table 28 – Crash Modification Analysis for Intersection Improvements

Begin MP	End MP	Intersecting Road	Potential Improvement	Crashes												Injury Severity					CMF					Existing Crashes/ Year	Anticipated Crashes/ Year
				LT	O	RE	B	S	SV	HO	AG	AL	P	RR	TOTAL	K	A	B	C	O	CMF	Countermeasure	Application: Crash Type	Application: Crash Severity	Application: Area Type		
329.20	329.20	Road 3N	Retime signal w/ protected left phase	6											6			1	1	4	0.01	Change Left-Turn Phase to Protected Phasing on one or more approaches[1]	Left-turn	K	Urban	0.00	0.00
																								A		0.00	0.00
																								B		0.20	0.00
																								C		0.20	0.00
																								O		0.80	0.01
329.20	329.20	Road 3N	Roundabout	6		8			1		1			3	19			2	3	14	0.81	Conversion of signalized intersection into single- or multi-lane roundabout[2]	All	K	Urban/ Suburban	0.00	0.00
																								A		0.00	0.00
																								B		0.40	0.32
																								C		0.60	0.49
																								O		2.80	2.27
331.27	331.27	Road 5N	Roundabout			2		3			1				6			2	2	2	0.33	Convert high-speed rural intersection to roundabout[3]	All	K	Rural	0.00	0.00
																								A		0.00	0.00
																								B		0.40	0.13
																								C		0.40	0.13
																								O		0.40	0.13
332.35	332.35	Road 6N	Align Road 6N on the east and west																								
333.40	333.40	Old Highway 89	Roundabout								2				2			1		1	0.33	Convert high-speed rural intersection to roundabout	All	K	Rural	0.00	0.00
																								A		0.00	0.00
																								B		0.20	0.07
																								C		0.00	0.00
																								O		0.20	0.07
334.50	334.50	Frontier Road	Roundabout												0						0.33	Convert high-speed rural intersection to roundabout	All	K	Rural	0.00	0.00
																								A		0.00	0.00
																								B		0.00	0.00
																								C		0.00	0.00
																								O		0.00	0.00
335.78	335.78	Little Ranch Road	Install Left-Turn Lane			1		1	2			1		1	6	1	1			4	0.67	Install Left-Turn Lane*	All	K	Rural	0.20	0.13
																								A		0.20	0.13
																								B		0.00	0.00
																								C		0.00	0.00
																								O		0.80	0.54
335.78	335.78	Little Ranch Road	Install Right-Turn Lane			1		1	2			1		1	6	1	1			4	0.86	Install Right-Turn lane[4]	All	K	All	0.20	0.17
																								A		0.20	0.17
																								B		0.00	0.00
																								C		0.00	0.00
																								O		0.80	0.69

Table 28 – Crash Modification Analysis for Intersection Improvements

Begin MP	End MP	Intersecting Road	Potential Improvement	Crashes												Injury Severity					CMF				Existing Crashes/ Year	Anticipated Crashes/ Year
				LT	O	RE	B	S	SV	HO	AG	AL	P	RR	TOTAL	K	A	B	C	O	CMF	Countermeasure	Application: Crash Type	Application: Crash Severity	Application: Area Type		
337.00	337.11	N/A	Lighting			1	1					2			4				1	3	0.63	Install Lighting[5]	Night-time	K	All	0.00	0.00
																								A		0.00	0.00
																								B		0.00	0.00
																								C		0.20	0.13
																					0.84	Install Lighting[6]	Night-time	O	All	0.60	0.50
337.70	337.70	Big Chino Road	Roundabout			1					1				2					2	0.33	Convert high-speed rural intersection to roundabout	All	K	Rural	0.00	0.00
																								A		0.00	0.00
																								B		0.20	0.07
																								C		0.00	0.00
																								O		0.80	0.17
338.81	338.81	Bramble Drive	Roundabout	4						1					5	1	1	2		1	0.33	Convert high-speed rural intersection to roundabout	All	K	Rural	0.20	0.07
																								A		0.20	0.07
																								B		0.40	0.13
																								C		0.00	0.00
																								O		0.20	0.07

[1]http://www.cmfclearinghouse.org/detail.cfm?facid=4576
[2]http://www.cmfclearinghouse.org/detail.cfm?facid=4194
[3] http://www.cmfclearinghouse.org/detail.cfm?facid=4695
[4] http://www.cmfclearinghouse.org/cmfpdf.cfm?facid=285
[5]http://www.cmfclearinghouse.org/detail.cfm?facid=7774
[6]http://www.cmfclearinghouse.org/detail.cfm?facid=7775
*From HSM

Table 29 – Crash Modification Analysis for Segment Improvements

Begin MP	End MP	Segment	Potential Improvement	Crashes												Injury Severity					CMF				Existing Crashes / Year	Anticipated Crashes/ Year
				LT	O	RE	B	S	SV	HO	AG	AL	P	RR	TOTAL	K	A	B	C	O	CMF	Countermeasure	Application				
																							Crash Type	Crash Severity	Area Type		
329.03	329.40	Butterfield Road to four to two-lane taper	Replace TWLTL with Raised Median	7	1	5		2				1			16			1	2	13	0.77	Replace TWLTL with Raised Median[1]	All	K	Urban	0.00	0.00
																								A		0.00	0.00
																								B		0.20	0.15
																								C		0.40	0.31
																								O		2.60	2.00
329.40	330.20	Four to two-lane taper to Road 4N	Widen to 4-lane section with raised median	2	2	6		3	1					1	15		2	3		10	0.712	Convert 2 lane roadway to 4 lane divided roadway[2]	All	K	Rural	0.00	0.00
																								A		0.40	0.28
																								B		0.60	0.43
																								C		0.00	0.00
																								O		2.00	1.42
330.20	331.28	Road 4N to Road 5N	Widen to 4-lane section with raised median		3	3		3			1			3	13			2	2	9	0.712	Convert 2 lane roadway to 4 lane divided roadway[2]	All	K	Rural	0.00	0.00
																								A		0.00	0.00
																								B		0.40	0.28
																								C		0.40	0.28
																								O		1.80	1.28
333.40	334.50	Old Highway 89 to Frontier Road	Widen to 4-lane section with graded median			8		1			1	1		4	15		1	4	2	8	0.712	Convert 2 lane roadway to 4 lane divided roadway[2]	All	K	Rural	0.00	0.00
																								A		0.20	0.14
																								B		0.80	0.57
																								C		0.40	0.28
																								O		1.60	1.14
334.00	341.42	--	Wildlife warning signage																								

[1]http://www.cmfclearinghouse.org/detail.cfm?facid=2514
[2]http://www.cmfclearinghouse.org/detail.cfm?facid=7569

10.1. Financial Benefit of Countermeasures

The financial benefit in terms of safety for each countermeasure with a corresponding CMF was obtained by comparing the number of existing crashes at a given severity to the anticipated number of crashes expected at a given severity over the anticipated life of the improvement. The lifespan of the countermeasure is assigned with the CMF. The cost per crash was determined using two bases for comparison, explained below and shown in ***Table 30*** and ***Table 31***.

First, the crash costs provided in the 2015 Arizona Crash Facts Summary, published by ADOT and summarized in ***Table 30***, were used to determine the economic loss associated with each crash type. This provides a cost for all crash severities. The financial benefit for each countermeasure using these values is shown in ***Table 32***.

Table 30 – 2015 Arizona Crash Facts Summary Average Economic Cost per Incident	
Fatality	$1,542,240
Incapacitating Injury	$90,270
Non-incapacitating Injury	$26,112
Possible Injury	$21,420
Property Damage Only	$11,526

"Cost estimates are based on a 2% increase of the 2014 National Safety Council estimates of the average cost of motor vehicle crashes, deaths, and injuries. These costs are an estimate of wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employer costs. A description of the National Safety Council's current cost estimating procedures may be found in the Technical Appendix of *Injury Facts*® (source: www.nsc.org/learn/safety-knowledge/Pages/injury-facts-estimating-cost-of-unintentional-injuries.aspx)."

The second costing method was based upon the HSIP application, which only assigns costs to fatal and incapacitating crashes as shown in ***Table 31***. The HSIP B/C ratios are important because they are tied to a project's eligibility to receive this type of project funding. While MPOs and COGs currently receive HSIP allocations, the funds will be available on a competitive basis beginning in fiscal year 2019. The financial benefit for each countermeasure using these values is shown in ***Table 33.***

Table 31 – 2017 HSIP Application Crash Severity Unit Costs	
Fatal	$5,800,000
Incapacitating Injury	$400,000

Table 32 – Financial Benefit of Countermeasures using 2015 Arizona Crash Facts Cost per Incident								
Begin MP	**End MP**	**Intersecting Road**	**Potential Improvement**	**Existing Cost Per Year**	**Anticipated Cost Per Year**	**Net Benefit Per Year**	**Assumed Lifespan of Countermeasure**	**Total Financial Benefit of Countermeasure**
329.20	329.20	Road 3N	Retime signal w/ protected left phase	$18,727.20	$187.27	$18,539.93	20	**$370,798.56**
329.20	329.20	Road 3N	Roundabout	$55,569.60	$45,011.38	$10,558.22	20	**$211,164.48**
331.27	331.27	Road 5N	Roundabout	$23,623.20	$7,795.66	$15,827.54	20	**$316,550.88**
332.35	332.35	Road 6N	Align Road 6N on the east and west	--	--	--	--	**--**
333.40	333.40	Old Highway 89	Roundabout	$7,527.60	$2,484.11	$5043.49	20	**$100,869.84**
334.50	334.50	Frontier Road	Roundabout	--	--	--	20	**--**
335.78	335.78	Little Ranch Road	Install left-turn lane	$335,722.80	$224,934.28	$110,788.52	20	**$2,215,770.48**
335.78	335.78	Little Ranch Road	Install right-turn lane	$335,722.80	$288,721.61	$47,001.19	20	**$940,023.84**
337.00	337.11	--	Lighting	$11,199.60	$8,508.02	$2,691.58	20	**$53,831.52**
337.70	337.70	Big Chino Road	Roundabout	$4,610.40	$1,521.43	$3,088.97	20	**$61,779.36**
338.81	338.81	Bramble Drive	Roundabout	$339,252.00	$111,953.16	$227,298.84	20	**$4,545,976.80**

Begin MP	**End MP**	**Segment**	**Potential Improvement**	**Existing Cost Per Year**	**Anticipated Cost Per Year**	**Net Benefit Per Year**	**Assumed Lifespan of Countermeasure**	**Total Financial Benefit of Countermeasure**
329.00	329.40	Butterfield Road to Road 3N	Convert TWLTL to Raised Median	$43,758.00	$33,693.66	$10,064.34	20	**$201,286.80**
329.40	330.20	Road 3N to Road 4N	Raised Median, 4 lanes	$74,827.20	$53,276.97	$21,550.23	20	**$431,004.67**
330.20	331.28	Road 4N to Road 5N	Raised Median, 4 lanes	$39,759.60	$28,308.84	$11,450.76	20	**$229,015.30**
333.40	334.50	Old Highway 89 to Frontier Road	Graded Median, 4 Lanes	$65,953.20	$46,958.68	$18,994.52	20	**$379,890.43**
334.00	341.42	--	Wildlife warning signage	--	--	--	--	**--**

Table 33 – Financial Benefit of Countermeasures using HSIP Cost per Incident								
Begin MP	**End MP**	**Intersecting Road**	**Potential Improvement**	**Existing Cost Per Year**	**Anticipated Cost Per Year**	**Net Benefit Per Year**	**Assumed Lifespan of Countermeasure**	**Total Financial Benefit of Countermeasure**
329.20	329.20	Road 3N	Retime signal w/ protected left phase					
329.20	329.20	Road 3N	Roundabout					
331.27	331.27	Road 5N	Roundabout					
332.35	332.35	Road 6N	Line up Road 6N on the east and west					
333.40	333.40	Old Highway 89	Roundabout					
334.50	334.50	Frontier Road	Roundabout					
335.78	335.78	Little Ranch Road	Install left-turn lane	$1,240,000.00	$830,800.00	$409,200.00	20	**$8,184,000.00**
335.78	335.78	Little Ranch Road	Install right-turn lane	$1,240,000.00	$1,066,400.00	$173,600.00	20	**$3,472,000.00**
337.00	337.11	--	Lighting					
337.70	337.70	Big Chino Road	Roundabout					
338.81	338.81	Bramble Drive	Roundabout	$1,240,000.00	$409,200.00	$830,800.00	20	**$16,616,000.00**

Begin MP	**End MP**	**Segment**	**Potential Improvement**	**Existing Cost Per Year**	**Anticipated Cost Per Year**	**Net Benefit Per Year**	**Assumed Lifespan of Countermeasure**	**Total Financial Benefit of Countermeasure**
329.00	329.40	Butterfield Road to Road 3N	Convert TWLTL to raised median	--	--	--	--	**--**
329.40	330.20	Road 3N to Road 4N	Raised Median, 4 lanes	$160,000.00	$113,920.00	$46,080.00	20	**$921,600.00**
330.20	331.28	Road 4N to Road 5N	Raised Median, 4 lanes	--	--			**--**
333.40	334.50	Old Highway 89 to Frontier Road	Graded Median, 4 Lanes	$80,000.00	$56,960.00	$23,040.00	20	**$460,800.00**
334.00	341.42	--	Wildlife warning signage	--	--	--	--	**--**

10.2. Benefit to Cost Ratio

The benefit to cost (B/C) ratio was determined by dividing the financial benefit in terms of safety for each countermeasure by the probable cost estimate. B/C ratios are summarized in ***Table 34***. Improvements that did not have a financial benefit per Section 10.1 were excluded as the B/C ratio is zero.

Table 34 – Benefit to Cost Ratio for Potential Improvements

Location	Potential Improvement	2015 Crash Facts B/C	2017 HSIP Application
Butterfield Road to Road 3N	Convert TWLTL to raised median	0.41	--
Road 3N	Retime signal w/ protected left phase	>100	--
Road 3N	Roundabout	0.11	
Road 3N to Road 4N	Raised Median, 4 lanes	0.07	0.16
Road 4N to Road 5N	Raised Median, 4 lanes	0.04	--
Road 5N	Roundabout	0.12	--
Old Highway 89	Roundabout	0.02	--
Old Highway 89 to Frontier Road	Graded Median, 4 Lanes	0.07	0.09
Little Ranch Road	Install left-turn lane	1.75	6.47
Little Ranch Road	Install right-turn lane	6.53	24.11
Paulden Post Office	Lighting	0.62	--
Big Chino Road	Roundabout	0.01	--
Bramble Drive	Roundabout	0.89	3.26

11.0 Evaluation of Potential Projects

11.1. Potential Projects

Improvements were combined into logical, constructible projects below and in ***Appendix WP2-1,*** the Recommendations Map Book. Each project description identifies the CMFs it includes. Projects are numbered from south to north.

Project P1A: Install Raised Median from Butterfield Road to Road 3N and Retime Signal at Road 3N

Description: This project combines two CMFs: 1) Converting the existing TWLTL to a raised median from Butterfield Road to Road 3N, and 2.) Provide a protected left-turn phase. The proposed section is the Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT RDG, modified to have an eight-foot wide raised median and five-foot wide sidewalk on both sides. The signal at Road 3N would be retimed with 100 second cycle for both peaks, with a protected-permitted southbound left-turn, protected only northbound left-turn, and permitted only eastbound and westbound left-turns.

Project P1B: Install Raised Median from Perkinsville Road to Road 3N with Roundabout at Road 3N

Description: This project combines two CMFs: 1) Converting the existing TWLTL to a raised median from Perkinsville Road to Road 3N, and 2.) Constructing a two-lane roundabout at Road 3N. The proposed section is the Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT RDG, modified to have an eight-foot wide raised median and five-foot wide sidewalk on both sides.

Project P2: Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N

Description: This project combines two CMFs: 1) Converting the existing TWLTL to a raised median from Perkinsville Road to just north of Road 3N where the existing four to two-lane taper ends, and 2) Widening the road and adding a median between the four to two-lane taper and Road 4N. The proposed section is the Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT RDG, modified to have an eight-foot wide raised median and five-foot wide sidewalk on both sides. Road 3 1/2N will be a future roundabout, funded by private development.

Project P3: Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N

Description: This project combines two CMFs: 1) Widening the road and adding a median between Road 4N and Road 5N, and 2) Construct a two-lane roundabout at Road 5N. The proposed section is the Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT RDG, modified to have an eight-foot wide raised median and five-foot wide sidewalk on both sides. This project could be constructed in phases, with the roundabout at Road 5N as the first phase.

Project P4: Align Approaches at Road 6N

Description: This improvement was identified to address access; no corresponding CMF was identified. It includes reconstruction of the eastern and western approaches at the Road 6N intersection so that they align (offset approximately 70 feet).

Project P5: Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road

Description: This project combines three CMFs: 1) widening the road and adding a median between Old Highway 89 to Frontier Road, 2) construct a two-lane roundabout at Old Highway 89, and 3) construct a two-lane roundabout at Frontier Road. The proposed section is the Fringe-Urban Highway Typical Section IS3 as shown in Figure 306.3 of the ADOT RDG. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.

Project P6: Construct Left- and Right-Turn Lanes at Little Ranch Road

Description: This project implements the CMFs for adding left- and right- turn lanes at Little Ranch Road.

Project P7: Install lighting at Paulden Post Office

Description: This project implements the CMF for lighting at the Paulden Post Office. If possible, it should be incorporated in the project currently under development.

Project P8: Construct Roundabout at Big Chino Road

Description: This project implements the CMF for constructing a roundabout at Big Chino Road.

Project P9: Construct Roundabout at Bramble Drive

Description: This project implements the CMF for constructing a roundabout at Bramble Drive.

Project P10: Install Wildlife Warning Signage from MP 334 to MP 348

Description: This improvement was identified to improve alert drivers to the presence of wildlife per the recommendations of the Statewide Wildlife Crash Analysis and Proposed Action Plan; no corresponding CMF was identified. It includes signage from MP 334 to 348.

11.2. Evaluation Criteria

Potential improvements were evaluated using the following criteria:

- ***Engineering features*** – How challenging projects may be to implement and build, considering feasibility and difficulty of design and construction.
- ***Property impacts*** – How substantial potential improvements impact existing and planned land uses, including future development opportunities.
- ***Environmental compatibility*** – How potential improvements may impact the environment, such as the natural environment, land use, cultural resources, and socioeconomic factors. The likely extent of environmental permitting, investigations, and remediation was also considered.
- ***Public input*** – Input on potential improvements from stakeholders and the general public. The Public Involvement Summary is included as ***Appendix WP2-5***.
- ***Safety impact*** – How well potential improvements may reduce crashes based upon analysis of five-year crash history with CMFs.
- ***Access management impact*** – How well potential improvements may improve access management.
- ***Cost*** – Planning-level cost estimate for each potential improvement in 2016 dollars.

11.3. Evaluation of Potential Improvements

The analysis of proposed improvements is summarized in ***Figure 21***. The table includes a qualitative rating as follows for each criterion:

- (+) represents an advantage;
- (o) represents neutral impacts; and
- (-) represents a disadvantage.

The ratings will be used to determine whether potential improvements are feasible and to facilitate prioritization. The evaluation criteria are not weighted.

Figure 21 – Qualitative Project Evaluation

	Engineering Features	Property Impacts	Environmental Compatibility	Public Input	Safety Impact	Access Management Impact	Cost*
Project P1A	+	○	○	+	+	+	$490,000
Project P1B	−	−	−	+	+	+	$2,010,000
Project P2	○	○	○	+	+	+	$5,890,000
Project P3	○	○	○	+	+	+	$8,370,000
Project P4	○	−	○	○	○	+	$480,000
Project P5	○	○	○	○	+	+	$13,190,000
Project P6	○	○	○	+	+	+	$1,410,000
Project P7	+	○	○	+	+	○	$90,000
Project P8	○	○	○	○	+	+	$4,540,000
Project P9	○	○	○	○	+	+	$5,100,000
Project P10	+	○	+	+	+	○	$3,000

*Potential right-of-way costs are not included.

Advantage + **Neutral** ○ **Disadvantage** −

11.4. Explanation of Ratings

The following describes anticipated advantages and disadvantages associated with each project. A neutral rating indicates no or balanced impacts, and was therefore not described.

Project P1A: There are no notable challenges associated with installing a raised median from Butterfield Road to Road 3N; there are safety and access management benefits. This project was well received by the public. This project maintains many of the advantages of Project P1B, with fewer disadvantages (assuming the CMF for adding a protected left-turn phase to the traffic signal performs as projected). These can be summarized as follows:

- Engineering features (+): median can be constructed within existing right-of-way; traffic signal improvements require no new infrastructure, simplifying implementation.
- Safety impact (+): the CMF for the raised median (0.77) is anticipated to reduce crashes of all types with a B/C ratio of 0.41 based on the Arizona Crash Facts Cost per Incident and 0 using HSIP cost per incident. The CMF for retiming the traffic signal at Road 3N is 0.01 and there is no cost associated with adding a protected left-turn phase to the traffic signal. The B/C ratio is >100 based on the Arizona Crash Facts Cost per Incident and 0 using the HSIP cost per incident.
- Access management impact (+): the median and protected left would eliminate left-turn conflicts. The median would also eliminate conflicts with vehicles making turns from opposite sides of the roadway and would improve corner clearance.
- Public Input (+): the public generally supported sidewalks and keeping the existing traffic signal.

Project P1B: While there are no notable challenges associated with installing a median from Perkinsville Road to Road 3N, there are engineering, property, and environmental challenges associated with the roundabout at Road 3N. There are safety and access management benefits associated with this project. These can be summarized as follows:

- Engineering features (-): limited right-of-way at Road 3N with adjacent development.
- Property impacts (-): Business on the southwest corner of Road 3N has parking within the likely roundabout footprint.
- Environmental compatibility (-): potentially historic property at the northwest corner of Road 3N; the property would likely be impacted by the roundabout footprint.
- Safety impact (+): Road 3N is the top crash location within the corridor. The CMF for the roundabout (0.81) and raised median (0.77) are anticipated to reduce crashes of all types and have B/C ratios of 0.11 and 0.41, respectively, based on the Arizona Crash Facts Cost per Incident and 0 using the HSIP cost per incident.
- Access management impact (+): both the roundabout and the raised median would eliminate left-turn conflicts. The raised median would also eliminate conflicts with vehicles making turns from opposite sides of the roadway and would improve corner clearance.
- Public Input (+): the public generally supported sidewalks. Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team.

Project P2: Widening to a four-lane section with a raised median from Road 3N to Road 4N has no strong disadvantages based upon the established evaluation criteria and has safety and access management advantages. These can be summarized as follows:

- Safety impact (+): the CMF for the widening/divided roadway (0.712) is anticipated to reduce crashes of all types and has a B/C ratio of 0.07 based on the Arizona Crash Facts Cost per Incident and 0.16 using the HSIP cost per incident.
- Access management impact (+): the median would eliminate left-turn conflicts, conflicts with vehicles making turns from opposite sides of the roadway, and would improve corner clearance.
- Public Input (+): the public generally supported sidewalks and safety improvements.

Project P3: Widening to a four-lane section with raised median from Road 4N to Road 5N and constructing a roundabout at Road 5N has no strong disadvantages based upon the established evaluation criteria, and has safety and access management advantages. These can be summarized as follows:

- Safety impact (+): the CMF for the roundabout (0.33) and widening/divided roadway (0.712) is anticipated to reduce crashes of all types and has B/C ratios of 0.12 and 0.04, respectively, based on the Arizona Crash Facts Cost per Incident and 0 using the HSIP cost per incident.
- Access management impact (+): both the roundabout and the raised median would eliminate left-turn conflicts. The median would eliminate conflicts with vehicles making turns from opposite sides of the roadway and would improve corner clearance.
- Public Input (+): the public generally supported sidewalks and safety improvements. Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team.

Project P4: Aligning the approaches at Road 6N has adverse property impacts. It was identified to improve access management; no corresponding CMF was identified. Therefore, there is no quantifiable safety benefit nor applicable B/C ratio. These can be summarized as follows:

- Property impacts (-): Private right-of-way would be required to align the intersection. The parcel is not currently developed nor part of a planned development.
- Access management impact (+): the offset intersection does not meet the guidelines provided in the TRB *Access Management Manual* (2014); aligning them would comply.
- Public Input (o): there were no recorded public comments related specifically to this project.

Project P5: Widening to a four-lane section with graded median from Old Highway 89 to Frontier Road and constructing roundabouts at Old Highway 89 and Frontier Road has no strong disadvantages based upon the established evaluation criteria, and has safety and access management advantages. These can be summarized as follows:

- Safety impact (+): the CMF for the roundabouts (0.33) and widening/divided roadway (0.712) is anticipated to reduce crashes of all types and has B/C ratios of 0.02, 0.07, and 0 based on the Arizona Crash Facts Cost per Incident for the roundabout at Old Highway 89, widening and dividing the roadway, and the roundabout at Frontier Road, respectively. These CMFs have B/C ratios of 0, 0.09, and 0, respectively, using the HSIP cost per incident.

- Access management impact (+): the roundabouts and the raised median would eliminate left-turn conflicts. The median would eliminate conflicts with vehicles making turns from opposite sides of the roadway and would improve corner clearance.
- Public Input (o): the public expressed concerns about safety in this area. Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team.

Project P6: There are no notable challenges associated with constructing left- and right-turn lanes at Little Ranch Road, and there are safety and access management advantages. These can be summarized as follows:

- Safety impact (+): the CMF for the left-turn lane (0.67) and right-turn lane (0.86) are anticipated to reduce crashes of all types and have B/C ratios of 1.75 and 6.53, respectively, based on the Arizona Crash Facts Cost per Incident and 6.47 and 24.11, respectively, using the HSIP cost per incident.
- Access management impact (+): the turn lanes would remove turning vehicles from the through lanes, thus improving operation.
- Public Input (+): the public supported turn lanes at this location.

Project P7: There are no notable challenges associated with installing lighting at the Paulden Post Office, and there are advantages for engineering features and safety impacts. These can be summarized as follows:

- Engineering features (+): lighting can be installed in the existing right-of-way, would not impact traffic during construction, and power is available at the site. Lighting could be implemented as part of a project currently under development.
- Safety impact (+): the CMF for lighting (0.63 and 0.84) are anticipated to reduce nighttime crashes of all types and have B/C ratios of 0.62 based on the Arizona Crash Facts Cost per Incident and 0 using the HSIP cost per incident.
- Public Input (+): the public supported lighting at various locations in the corridor.

Project P8: There are no notable challenges associated with constructing a roundabout at Big Chino Road, and there are safety and access management benefits. These can be summarized as follows:

- Safety impact (+): the CMF for the roundabout (0.33) is anticipated to reduce crashes of all types and has B/C ratio of 0.01 based on the Arizona Crash Facts Cost per Incident and 0 using the HSIP cost per incident.
- Access management impact (+): the roundabouts and the raised median would eliminate turning conflicts, provide an opportunity for U-turns, and fit with the long-term access management vision.
- Public Input (o): the public expressed concerns about safety in this area. Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team.

Project P9: There are no notable challenges associated with constructing a roundabout at Bramble Drive, and there are safety and access management benefits. These can be summarized as follows:

- Safety impact (+): the CMF for the roundabout (0.33) is anticipated to reduce crashes of all types and has B/C ratio of 0.89 based on the Arizona Crash Facts Cost per Incident and 3.26 using the HSIP cost per incident.
- Access management impact (+): the roundabout would eliminate turning conflicts, provide an opportunity for U-turns, and fit with the long-term access management vision.
- Public Input (o): the public expressed concerns about safety in this area. Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team.

Project P10: There are no notable challenges associated with installing wildlife warning signage from MP 334 to MP 348. There are engineering, environmental, and safety advantages. These can be summarized as follows:

- Engineering features (+): signage can be installed with little pre-installation activity.
- Environmental compatibility (+): signage to alert motorists could mitigate crashes involving animals.
- Safety impact (+): no corresponding CMF was identified; however, this segment of this corridor was identified as one of the top locations in the state for crashes involving animals. There is no quantifiable safety benefit nor applicable B/C ratio; however, sign installation would meet the recommendations of the Statewide Wildlife Crash Analysis and Proposed Action Plan developed by ADOT.
- Public Input (+): the public expressed concerns about antelope and other wildlife, though no specific comments on signage were recorded.

12.0 Recommendations

The following recommendations are based upon the five-year crash history, existing and anticipated development, stakeholder input, B/C ratios presented in ***Table 34,*** and the evaluations presented in ***Figure 21.*** Prioritization should be revisited if crash patterns or anticipated development change. Implementation could be impacted by the availability of potential partnerships or other funding opportunities.

In some cases, it may be desirable to construct improvements without constructing the entirety of the project; necessary sequencing has been identified to allow independent functionality.

For major highway reconstruction projects, such as adding lanes or a divided cross-section, a speed study should be conducted as soon as practical after all work has been completed and the roadway is open to free-flow traffic.

12.1. Near-term (5-year)

The following projects are recommended for implementation in the near-term:

- Project P1A: Install Raised Median from Butterfield Road to Road 3N and Retime Signal at Road 3N.
- Project P7: Install Lighting at Paulden Post Office.
- Project P10: Install Wildlife Warning Signage from MP 334 to MP 348.

These projects are lower cost. In addition to infrastructure improvements, access management should be considered for new development. It may be beneficial to conduct a safety campaign with targeting behavioral traits from the SHSP, including Slow Down, Buckle Up, Pay Attention, and Drive Sober.

12.2. Mid-term (10-year)

The following projects are recommended for implementation in the mid-term:

- Project P2: Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N. Construct roundabout at Road 3 1/2N, as needed and funded by private development.
- Project P3: Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N.
- Project P6: Construct Left-and Right-Turn Lanes at Little Ranch Road.
- Project P8: Construct Roundabout at Big Chino Road.
- Project P9: Construct Roundabout at Bramble Drive.

Widening should begin at Road 3N and continue north to provide a consistent roadway section with the area south of the study area. This will maximize the access management and safety benefit associated with the divided roadway and widening as the majority of the existing conflict points and crashes occur in the southern extents of the corridor. Roundabouts that will accommodate U-turn and left-turn movements should be constructed at the same time or before the raised median.

12.3. Long-term (20-year)

The following projects are recommended for implementation in the long-term:

- Project P4: Align Approaches at Road 6N.
- Project P5: Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road.

These recommendations are summarized in ***Table 35***.

Table 35 – Project Recommendations

Project	Project Limits (MP)	Scope of Work	Planning Horizon	Estimate of Probable Cost
P1A – Install Raised Median from Butterfield Road to Road 3N and Retime Signal at Road 3N	329.03 – 329.20	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Butterfield Road to Road 3N. Mill and overlay existing asphaltic concrete pavement; existing curb and gutter to remain. Retime the existing signal at Road 3N with a 100 second cycle for both peaks, with a protected permitted southbound left-turn, protected only northbound left-turn, and permitted only eastbound and westbound left-turns.	Near-term	$490,000
P1B – Install Raised Median from Perkinsville Road to Road 3N with Roundabout at Road 3N	329.00 – 329.20	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Perkinsville Road to Road 3N. Construct a two-lane roundabout at Road 3N.	Long-term	$2,010,000
P2 – Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N	329.20 – 330.20	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 3N to Road 4N roundabout. Construct future roundabout at Road 3 1/2N, funded by private development.	Mid-term	$5,890,000
P3 – Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N	330.20 – 331.28	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase.	Mid-term	$8,370,000
P4 – Align Approaches at Road 6N	332.35	Reconstruct the east and westbound approaches at the Road 6N intersection so that they align (offset approximately 70 feet).	Long-term	$480,000
P5 – Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road	333.41 – 334.50	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.	Long-term	$13,190,000

Table 35 – Project Recommendations				
Project	**Project Limits (MP)**	**Scope of Work**	**Planning Horizon**	**Estimate of Probable Cost**
P6 – Construct Left- and Right-Turn Lanes at Little Ranch Road	335.77	Construct left- and right-turn lanes at Little Ranch Road.	Mid-term	$1,410,000
P7 – Install Lighting at Paulden Post Office	337.05	Install street lighting at the Paulden post office. Cost and CMF assume spot lighting with four poles. Bundling this project with the currently programmed project should be considered.	Near-term	$90,000
P8 – Construct Roundabout at Big Chino Road	337.70	Construct a two-lane roundabout. This project could be bundled with the roundabout at Bramble Drive or constructed sequentially as needed.	Mid-term	$4,540,000
P9 – Construct Roundabout at Bramble Drive	338.80	Construct a two-lane roundabout. This project could be bundled with the roundabout at Big Chino Road or constructed sequentially as needed.	Mid-term	$5,100,000
P10 – Install Wildlife Warning Signage from MP 334 to MP 348	334.00 – 348.00	Install wildlife warning signage from MP 334 to 348.	Near-term	$3,000

13.0 Field Review and Preliminary Scoping

The Study Team selected five of the recommended projects for further evaluation, including a field review and preliminary scoping (prescoping) based on the anticipated availability of funding and the recommended implementation schedule. The prescoping process facilitates programming projects by refining the project costs and schedule. The five projects are:

- Project P1A and P2: Widen to Four-Lane Section with Raised Median from Butterfield Road to Road 4N and retime the existing traffic signal at Road 3N.
- Project P6: Construct Left- and Right-Turn Lanes at Little Ranch Road.
- Project P8: Construct Roundabout at Big Chino Road.
- Project P9: Construct Roundabout at Bramble Drive.

The purpose of the field review is to assemble a knowledgeable team to identify known and potential engineering issues and deficiencies within the project study area. Prior to the field review, background data is assembled and presented to the team. The findings from the field review, including the background data, are documented using a Field Review Report and used to develop a Prescoping Report. The Field Review Report summarizes study area details including background data, bridge design, bridge hydraulics/drainage, environmental, geotechnical, pavement/materials, right-of-way, roadway/drainage, traffic/safety, utilities, and ADOT district constructability and maintenance.

The purpose of a Preliminary Scoping Report is to develop a scope of work; schedule; and planning level cost estimate to complete project design, obtain clearances, and construction. The Preliminary Scoping Report includes general project information, project need and purpose, risks, potential funding sources, cost estimate, and recommended project delivery method.

The field review was conducted on January 11, 2017. Preliminary Scoping Reports, including the Field Review Reports with kickoff meeting summaries identifying attendees, are included in Appendix FR-1.

APPENDIX WP1-1

Current Conditions Summary Map Book

State Route 89 Chino Valley to Forest Boundary
Transportation Study

ADOT Task Assignment MPD 0034-16

Appendix WP1-1 Current Conditions Summary Map Book

Prepared for:

ADOT

AND

CYMPO
Central Yavapai Metropolitan Planning Organization

Prepared by:

BURGESS & NIPLE

ROADWAY FEATURES

Total Approximate R/W Width			
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service	2016*	
		2036	
	Right Turn Lane		
	Shoulder		
	Access		
	Curb		
Center-line	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		
	Right Turn Lane		
	Level of Service	2016*	
		2036	

*Traffic Counts collected March 2016

Northbound legend is the same as Southbound.

X FT ⟷ X FT — Width Based Upon Available Information

No Rumble Strip

Rumble Strip Present at Edge

0 – 3% Grade

3 – 6% Grade

> 6% Grade

NB/SB X FT ⟷ NB/SB X FT — From Edge of Pavement

A

B

C

D

E

F

No Right Turn Lane

Right Turn Lane Present

No Shoulder

6-Foot Shoulder Present

8-Foot Shoulder Present

10-Foot Shoulder Present

Does Not Meet Minimum ADOT Draft Access Management Guidelines for Required Access Spacing

Meets Minimum ADOT Draft Access Management Guidelines for Required Access Spacing

No Curb

Curb Present

No Passing

Passing Permitted

No Left Turn Lane

SB Left Turn Lane Present

NB Left Turn Lane Present

Two Way Left Turn Lane Present

MAP BOOK INDEX

Area	Map Book Page No.	SR 89 Milepost Range
Chino Valley	1 – 10, 13 – 14	328.95 – 333.68, 335.22 – 335.77
Yavapai County	10 – 13, 14 – 25	333.68 – 335.22, 335.77 – 341.42

SYMBOLS

Left Turn Phasing – Protected/Permissive

Crash/Injury Type

Injury	Symbol	Driver Impairment**
Fatal		
Incapacitating		
Non-Incapacitating		
Possible Injury		
No Injury Reported		

*** Driver Impairment includes Alcohol, Illness, Physical Impairment, Fell Asleep/Fatigue, Drugs, Medications, Other, and Unknown*

Legend

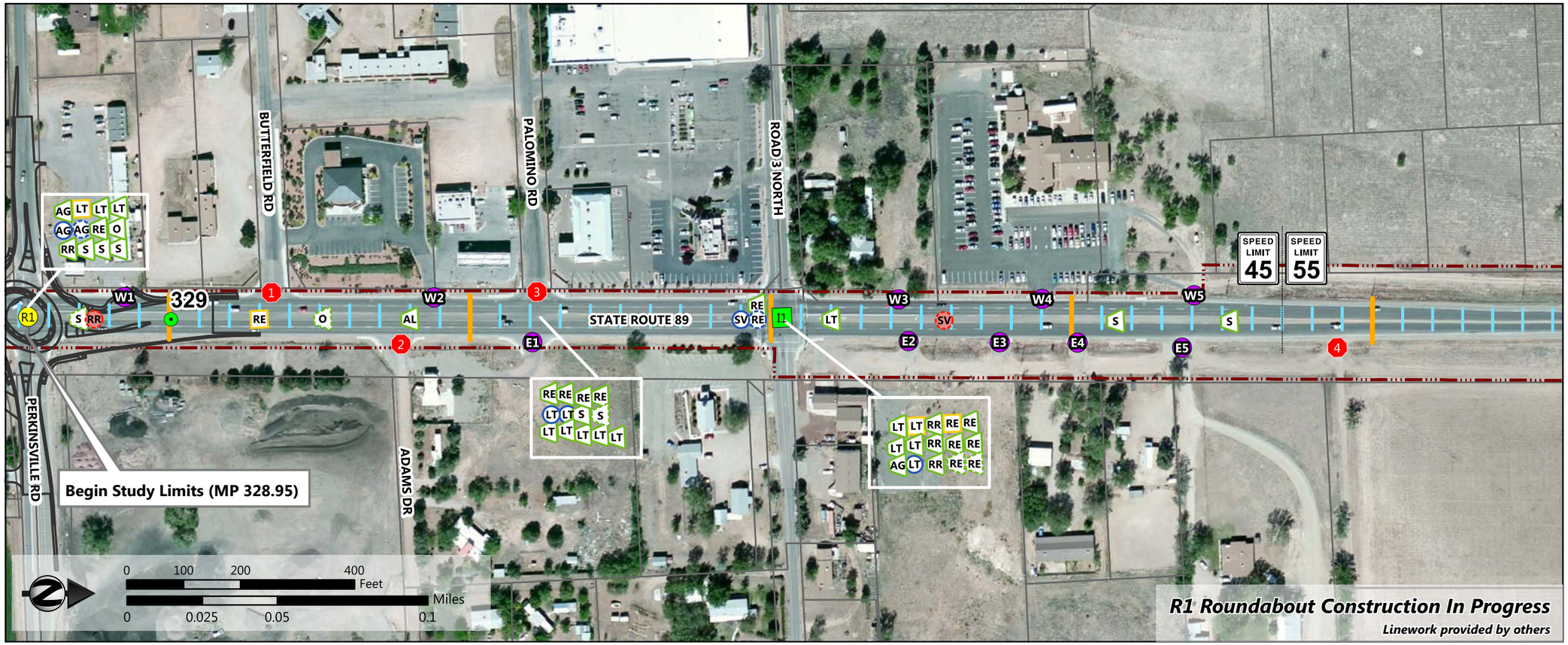
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)						
Contributing Factors	Night Condition	25%	x	23%	7%	x
	Incliment Weather	8%	x	8%	20%	
Driver Impairment (DI)	Alcohol/Drugs	x			x	x
	Illness					
	Other/Unknown	x	x	x	x	
	Medications				x	
	Fatigue	x				

ROADWAY FEATURES						
Total Approximate R/W Width		100FT	100FT	125 FT	125 FT	200 FT / 200 FT
Rumble Strip						
Roadway Grade						
Overhead Power		10 FT SB EOP				10 FT SB EOP
SB	Level of Service 2016*	LOS B				
	Level of Service 2036	LOS B				
	Right Turn Lane					
	Shoulder					10 FT / 10 FT
	Access					
	Curb					
Centerline	Passing/No Passing					
	Left Turn Lane					
NB	Curb					
	Access					
	Shoulder					10 FT / 10 FT
	Right Turn Lane					
	Level of Service 2016*	LOS A				
	Level of Service 2036	LOS B				

Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

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RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
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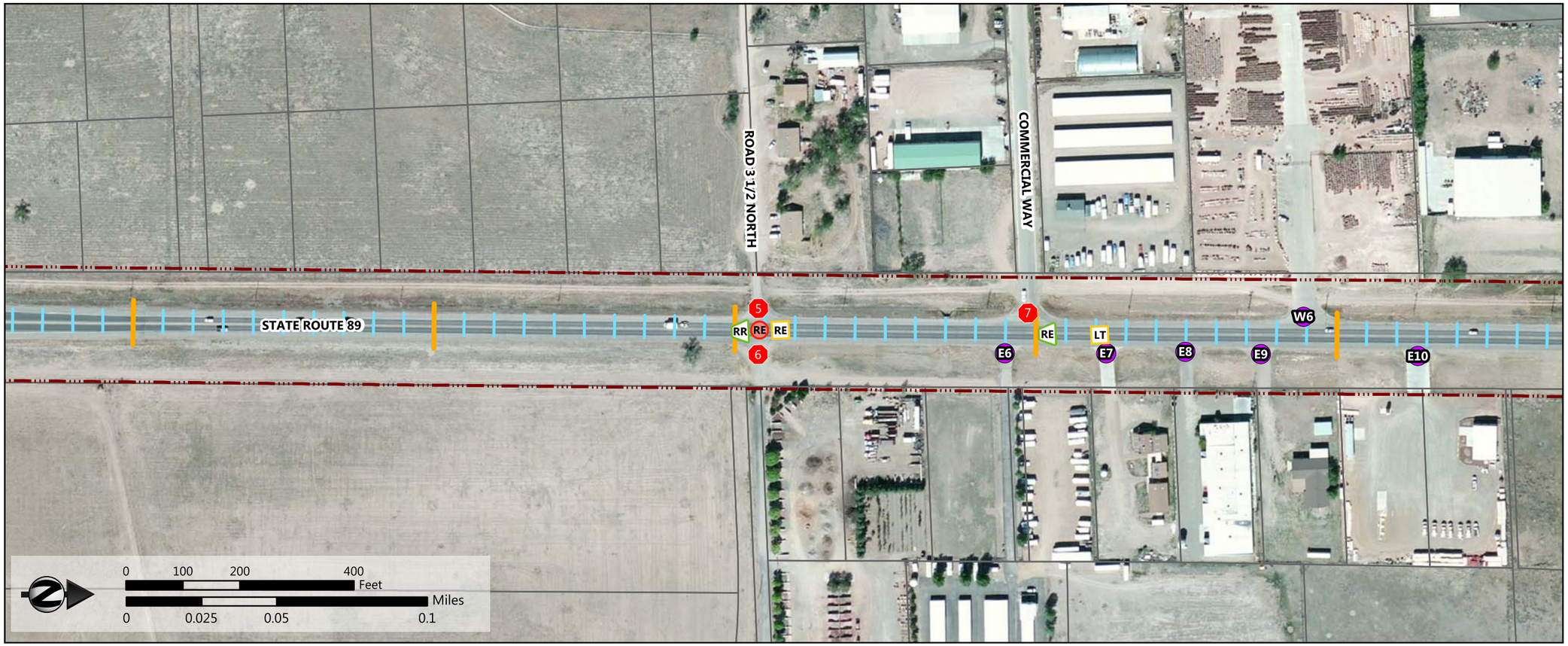

CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	x
	Incliment Weather	
Driver Impairment (DI)	Alcohol/Drugs	
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	

ROADWAY FEATURES			
Total Approximate R/W Width			200 FT ⟷ 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			20 FT SB EOP ⟷ 20 FT SB EOP
SB	Level of Service	2016*	LOS B
		2036	LOS B
	Right Turn Lane		
	Shoulder		10 FT ⟷ 10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT ⟷ 10 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS B

Legend

- ADOT Mile Posts
- Municipal Boundary
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- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
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- Non-Incapacitating – DI
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- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

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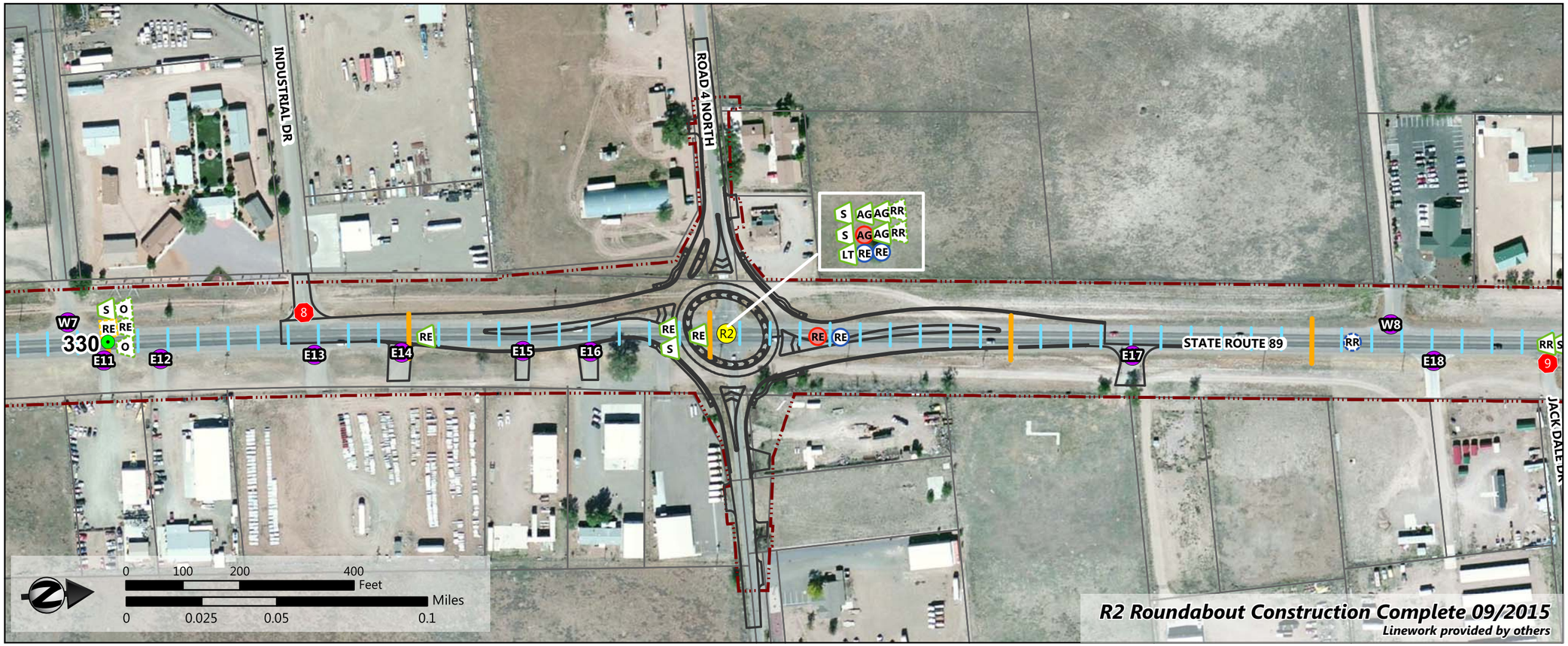

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	20%	18%
	Incliment Weather	20%	18%
Driver Impairment (DI)	Alcohol/Drugs	x	
	Illness		
	Other/Unknown	x	x
	Medications		x
	Fatigue		x

ROADWAY FEATURES				
Total Approximate R/W Width		200 FT		200 FT
Rumble Strip				
Roadway Grade				
Overhead Power		20 FT SB EOP	20 FT SB EOP / 20 FT NB EOP	20 FT NB EOP
SB	Level of Service 2016*	LOS B	LOS A	
	Level of Service 2036	LOS B	LOS A	
	Right Turn Lane			
	Shoulder	10 FT	10 FT / 10 FT	10 FT
	Access			
	Curb			
Centerline	Passing/No Passing			
	Left Turn Lane			
NB	Curb			
	Access			
	Shoulder	10 FT	10 FT / 10 FT	10 FT
	Right Turn Lane			
	Level of Service 2016*	LOS A		
	Level of Service 2036	LOS B	LOS A	

7/01/2016

Legend

- ADOT Mile Posts
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- Intersection – Stop
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SR 89 Crash Data

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- Fatal – DI
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- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

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AG	Angle
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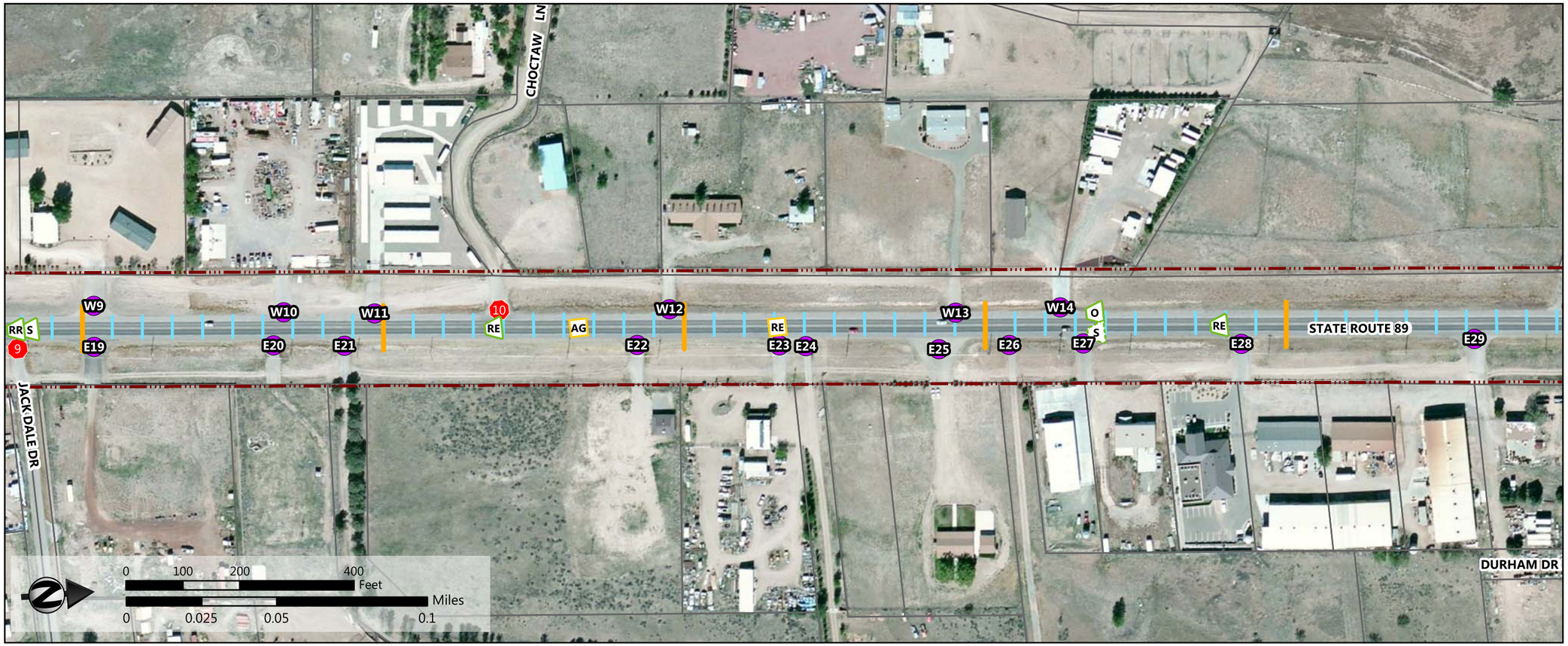

7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	50%
	Incliment Weather	x	50%
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		x
	Medications		
	Fatigue		

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		20 FT NB EOP	20 FT NB EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

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- Possible Injury – DI
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- No Injury – DI

Crash Type

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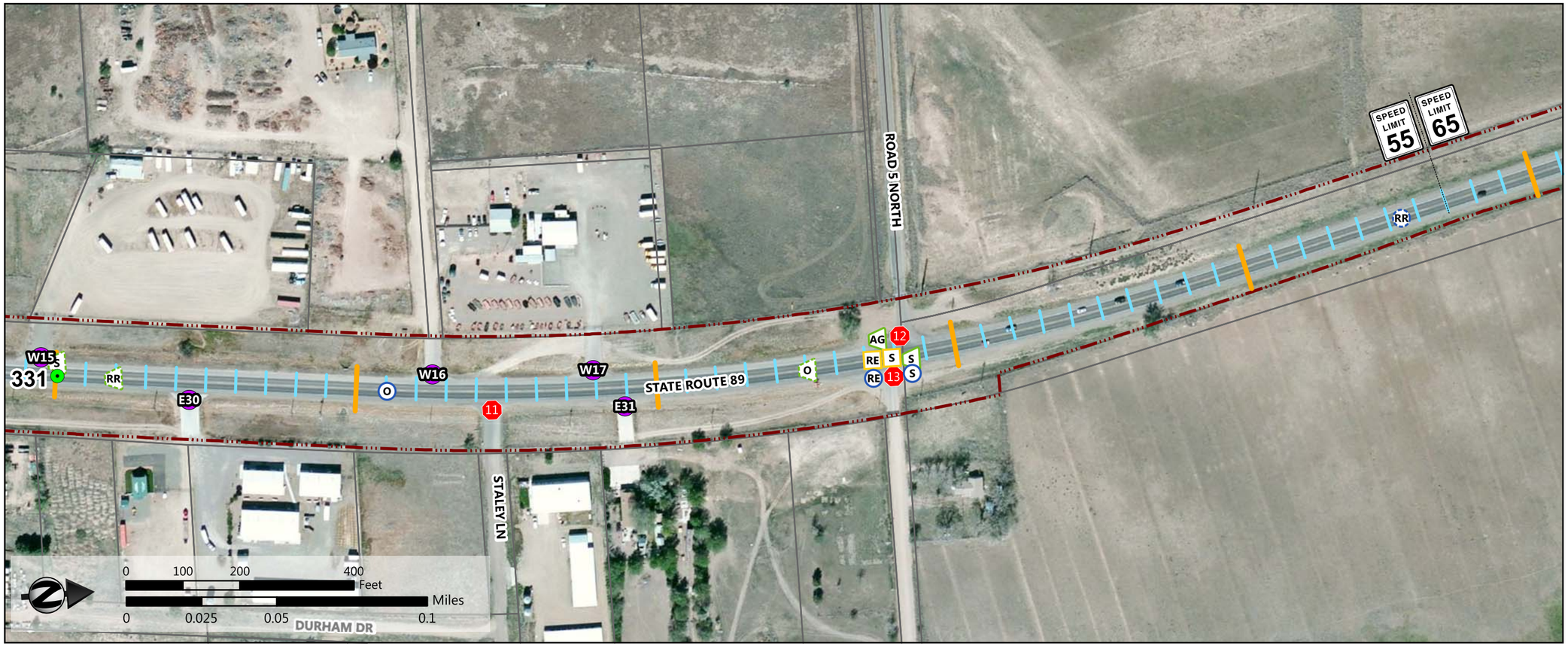

7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs	x	x
	Illness		
	Other/Unknown	x	
	Medications		
	Fatigue	x	

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT / 125 FT / 125 FT
Rumble Strip			
Roadway Grade			
Overhead Power		20 FT NB EOP	20 FT NB EOP / SB 80 FT FROM EOP / SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

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Crash Type

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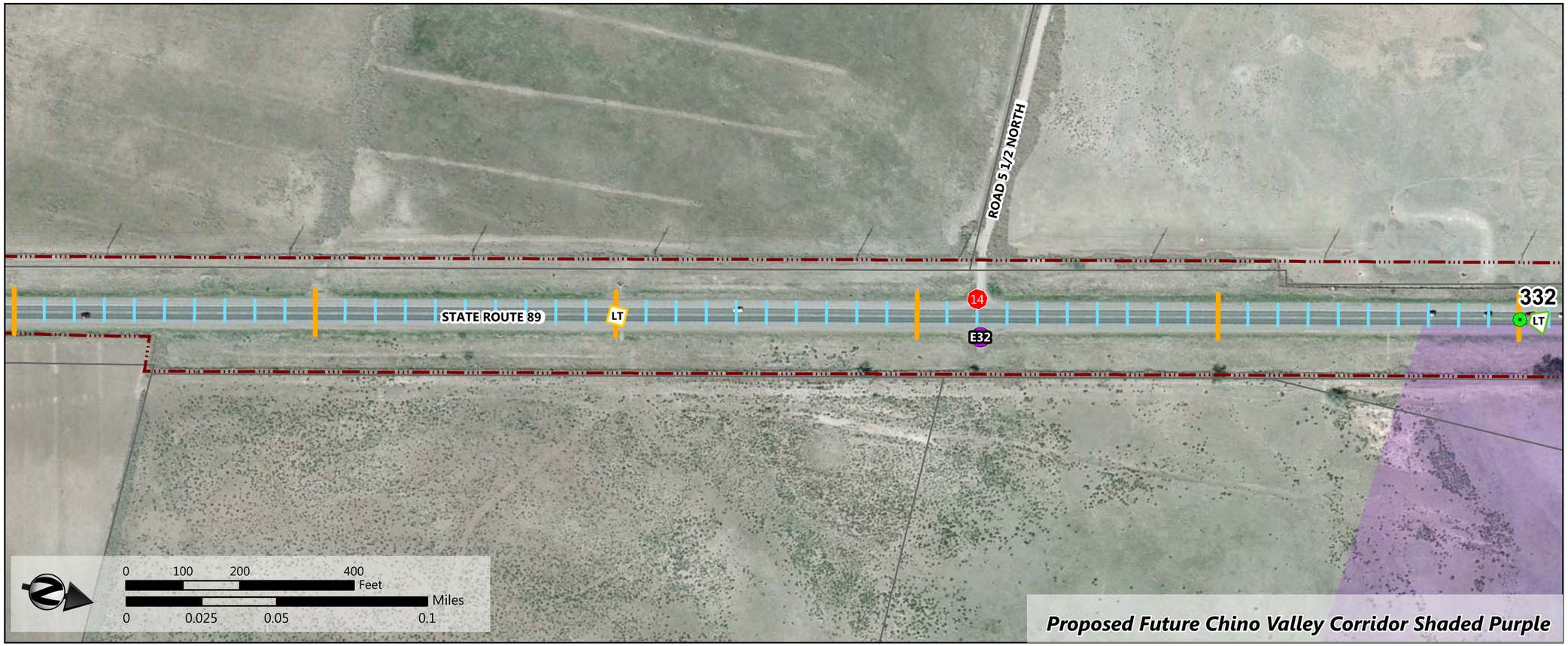

7/01/2016

		CRASH HISTORY (2011-2015)	
Contributing Factors	Night Condition	x	
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue		
		ROADWAY FEATURES	
Total Approximate R/W Width		125 FT	125 FT / 200 FT / 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		SB 80 FT FROM EOP	SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

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- Possible Injury – DI
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- No Injury – DI

Crash Type

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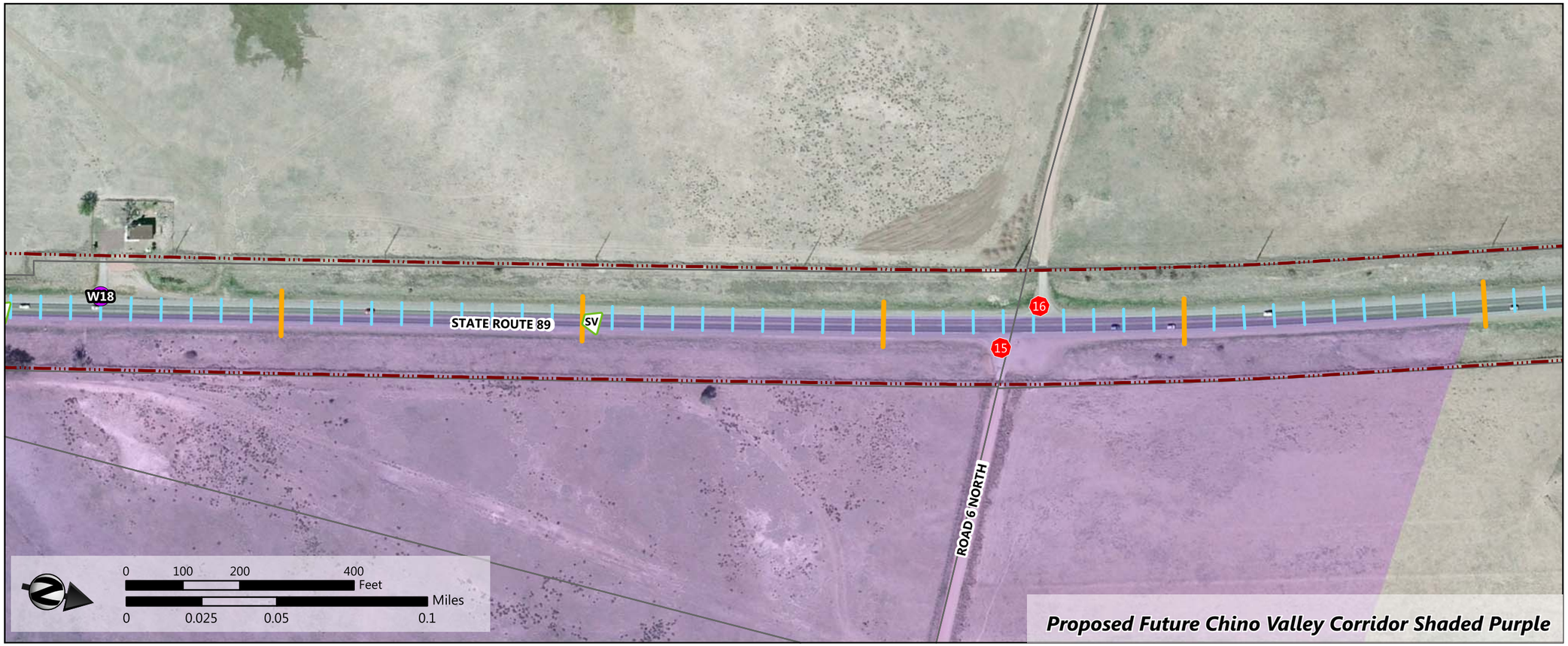

CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	
	Incliment Weather	
Driver Impairment (DI)	Alcohol/Drugs	
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	

ROADWAY FEATURES			
Total Approximate R/W Width			200 FT ⟷ 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			SB 80 FT FROM EOP ⟷ SB 80 FT FROM EOP
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		10 FT ⟷ 10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT ⟷ 10 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

- ADOT Mile Posts
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- Intersection – Stop
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- Non-Incapacitating – DI
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- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
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HO	Head On
AG	Angle
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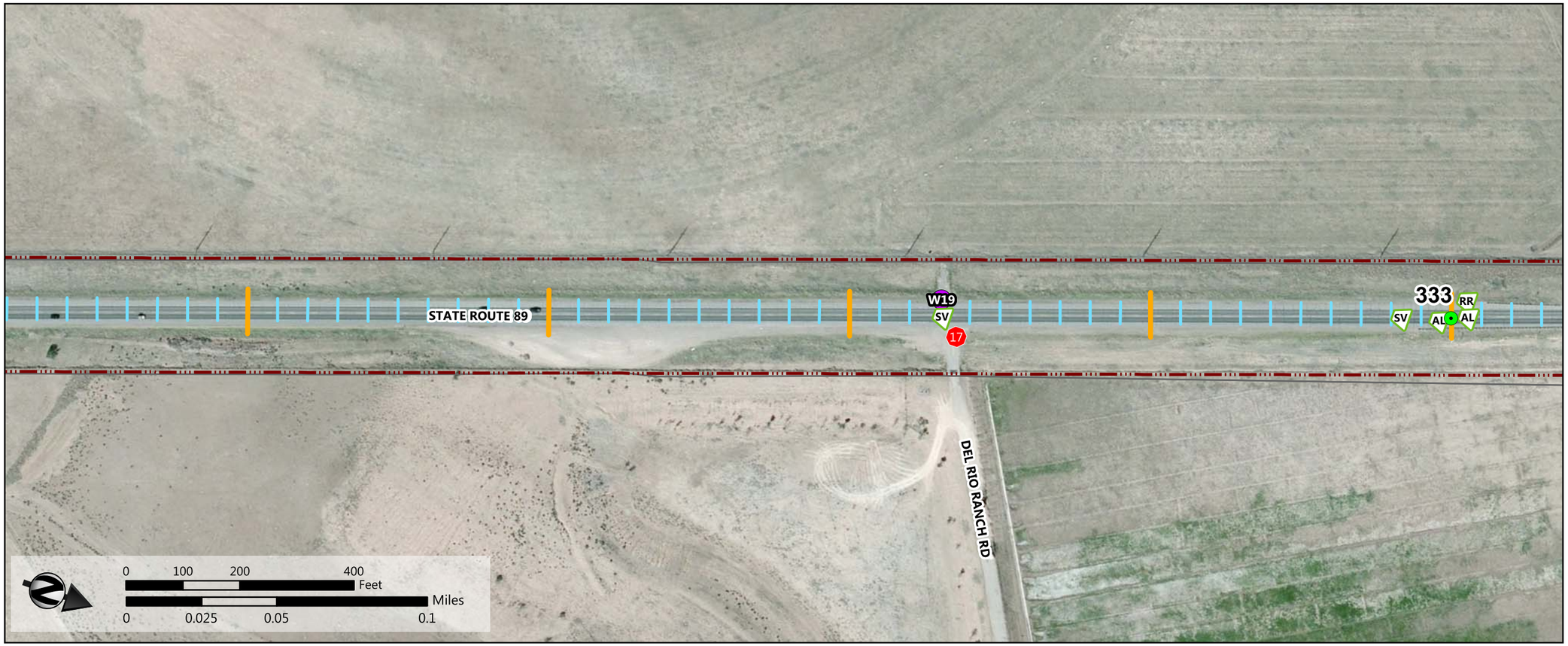

7/01/2016

			333
CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x x x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue		
ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		SB 80 FT FROM EOP	SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

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Crash Type

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HO	Head On
AG	Angle
AL	Animal
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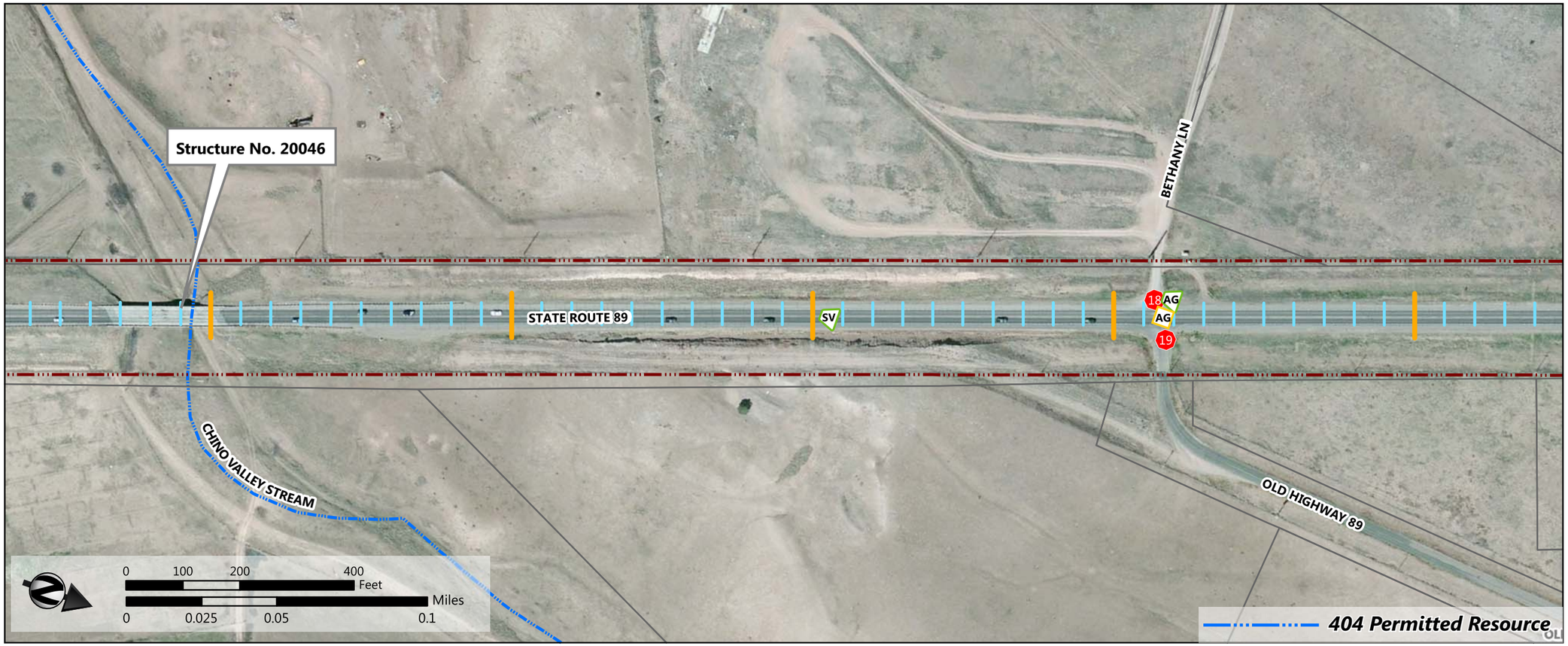

CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	x
	Incliment Weather	x
Driver Impairment (DI)	Alcohol/Drugs	
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	

ROADWAY FEATURES			
Total Approximate R/W Width			200 FT ⟷ 200FT
Rumble Strip			
Roadway Grade			
Overhead Power			SB 80 FT FROM EOP ⟷ SB 80 FT FROM EOP | NB 80 FT FROM EOP ⟷ NB 80 FT FROM EOP
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		10 FT ⟷ 10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT ⟷ 10 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

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- Driveway
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- Intersection – Stop
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- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
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- No Injury – DI

Crash Type

LT	Left Turn
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RE	Rear End
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AL	Animal
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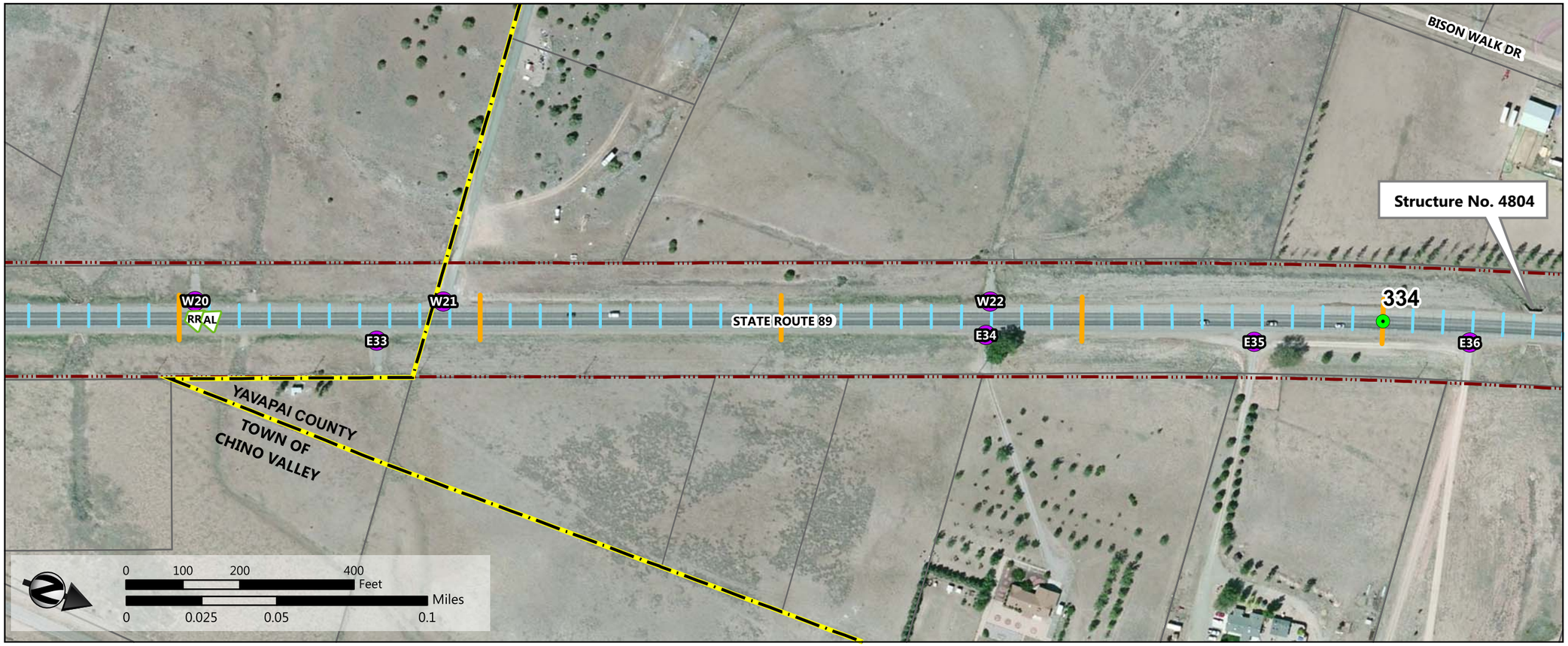
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	
	Incliment Weather	
Driver Impairment (DI)	Alcohol/Drugs	
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	

ROADWAY FEATURES			
Total Approximate R/W Width			200 FT ← → 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			NB 80 FT FROM EOP ← → NB 80 FT FROM EOP
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		10 FT ... 10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT ... 10 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

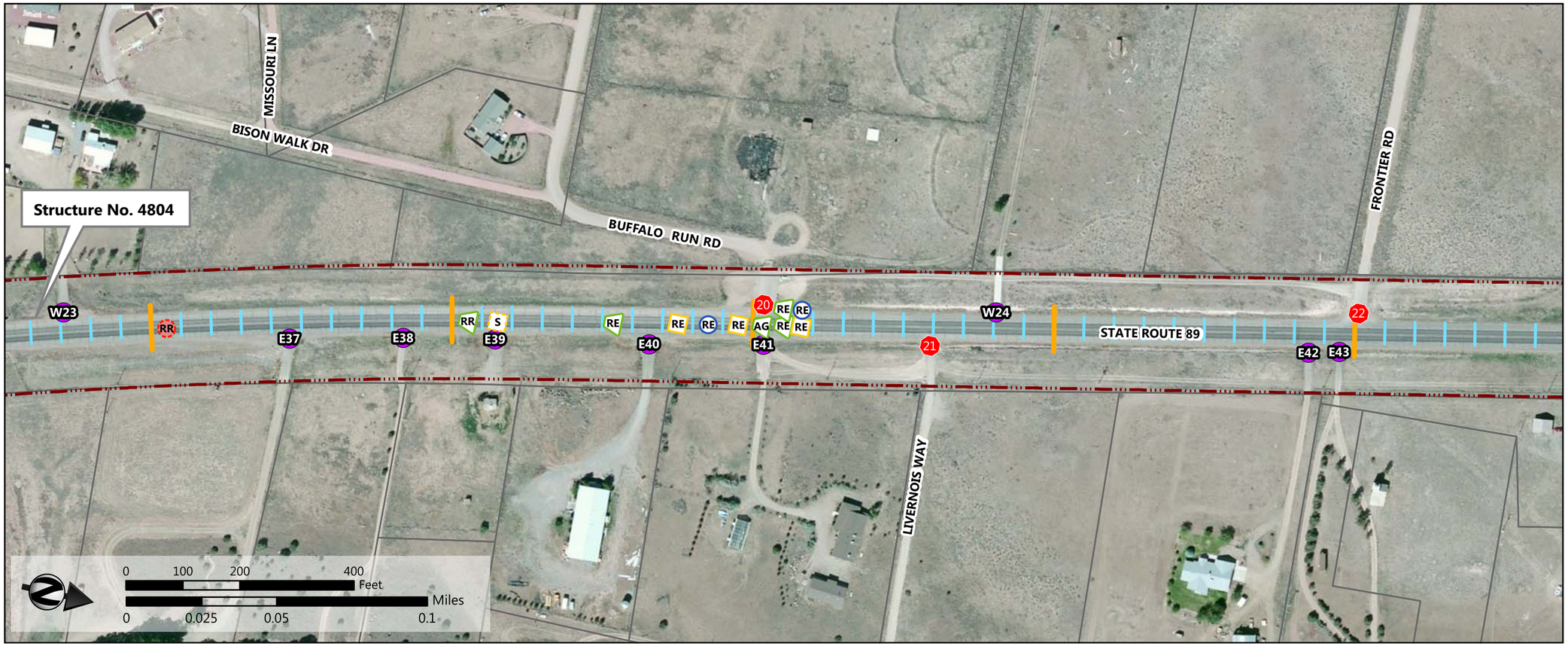
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)						
Contributing Factors	Night Condition		x	x	20%	
	Incliment Weather			x	20%	
Driver Impairment (DI)	Alcohol/Drugs					
	Illness					
	Other/Unknown					
	Medications	x				
	Fatigue	x	x			

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		NB 80 FT FROM EOP	NB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

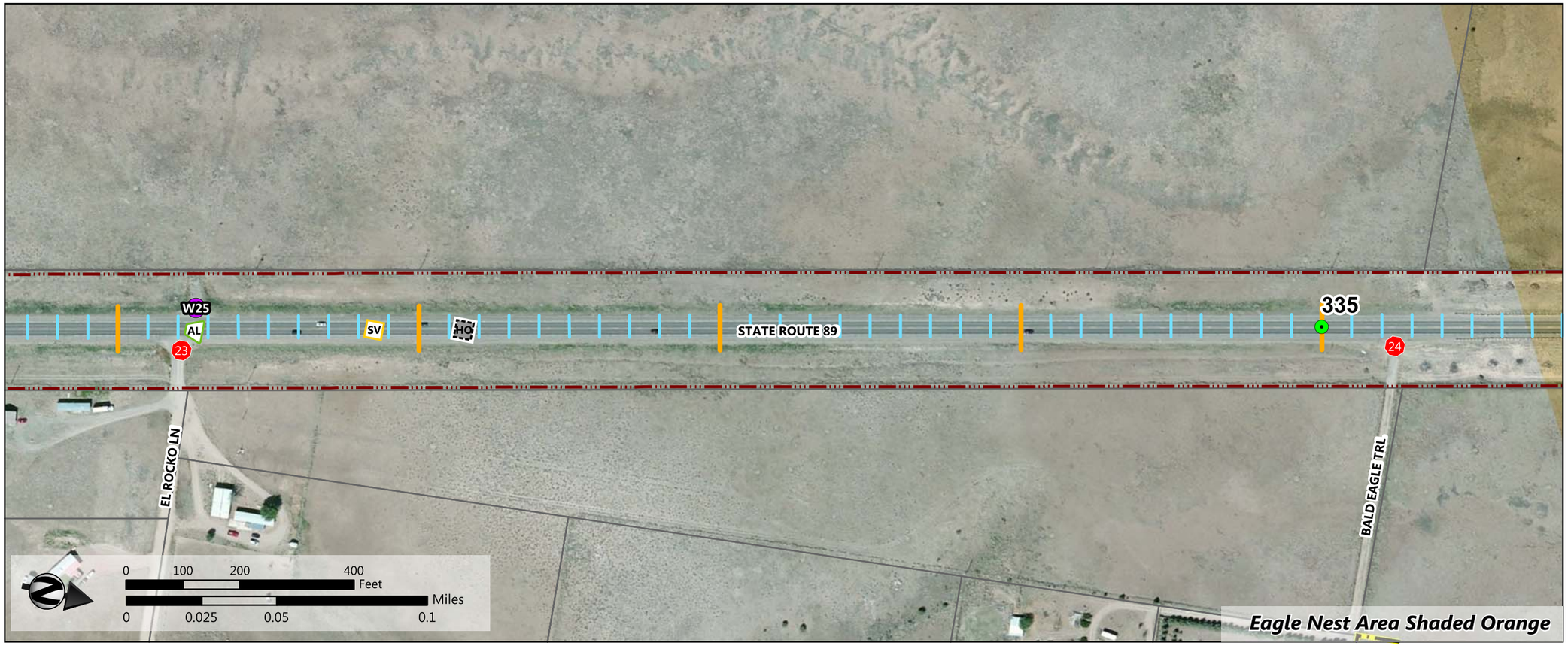
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x
	Incliment Weather	x	
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		x
	Medications		
	Fatigue		
ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		NB 80 FT FROM EOP	SB 80 FT FROM EOP / SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

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Legend

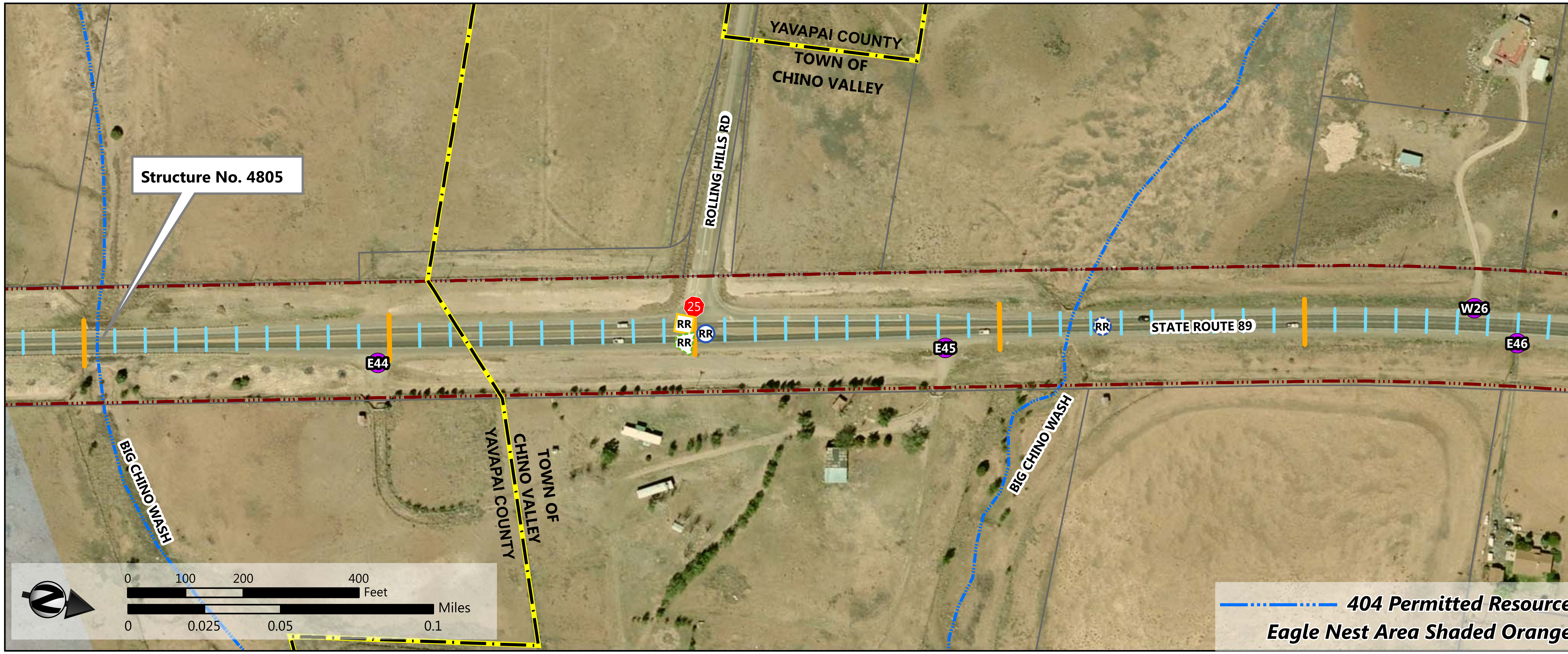
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)

Contributing Factors	Night Condition	x x x
	Incliment Weather	x
Driver Impairment (DI)	Alcohol/Drugs	x
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	x

ROADWAY FEATURES

Total Approximate R/W Width			200 FT ← → 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			SB 80 FT FROM EOP ← → SB 80 FT FROM EOP | NB 80 FT FROM EOP →
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		10 FT … 10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT … 10 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

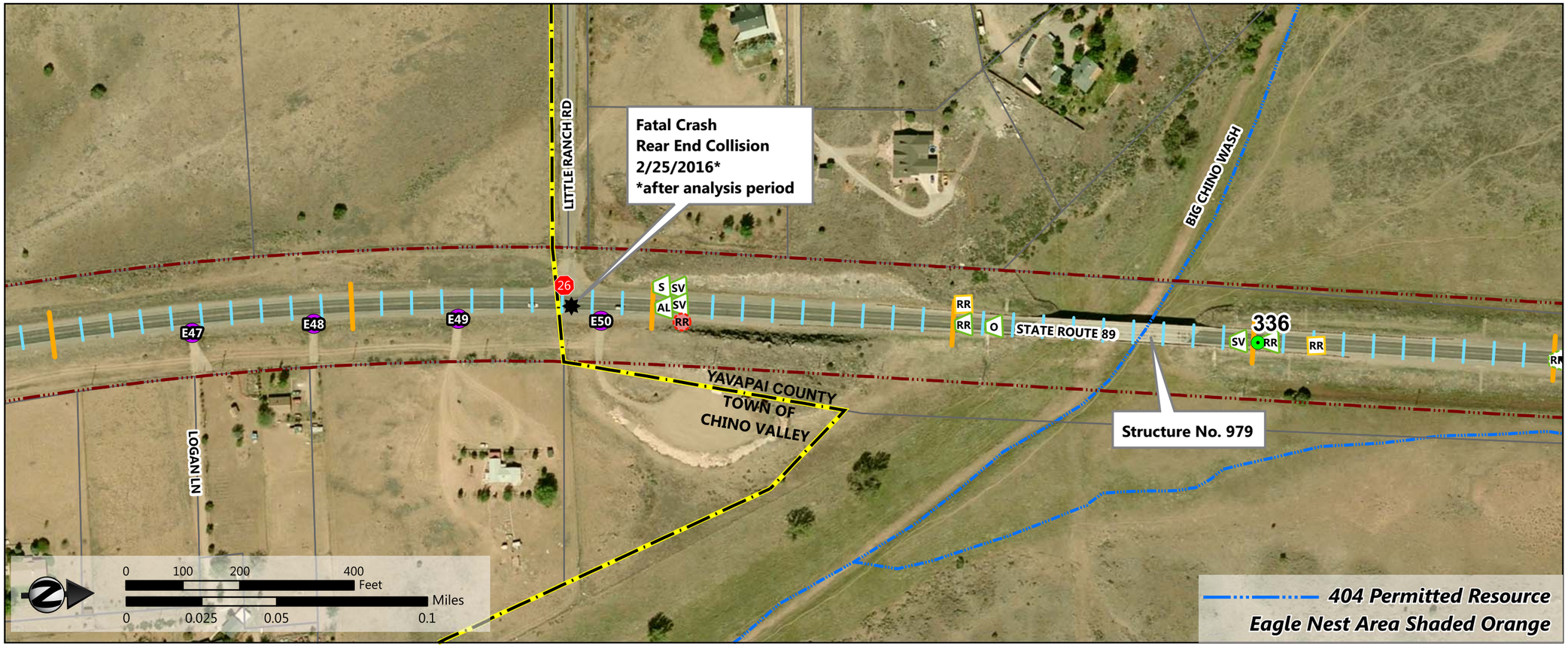
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



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CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	80%	
	Incliment Weather	40%	x
Driver Impairment (DI)	Alcohol/Drugs		
	Illness	x	
	Other/Unknown		
	Medications		
	Fatigue		

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		NB 80 FT FROM EOP	NB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

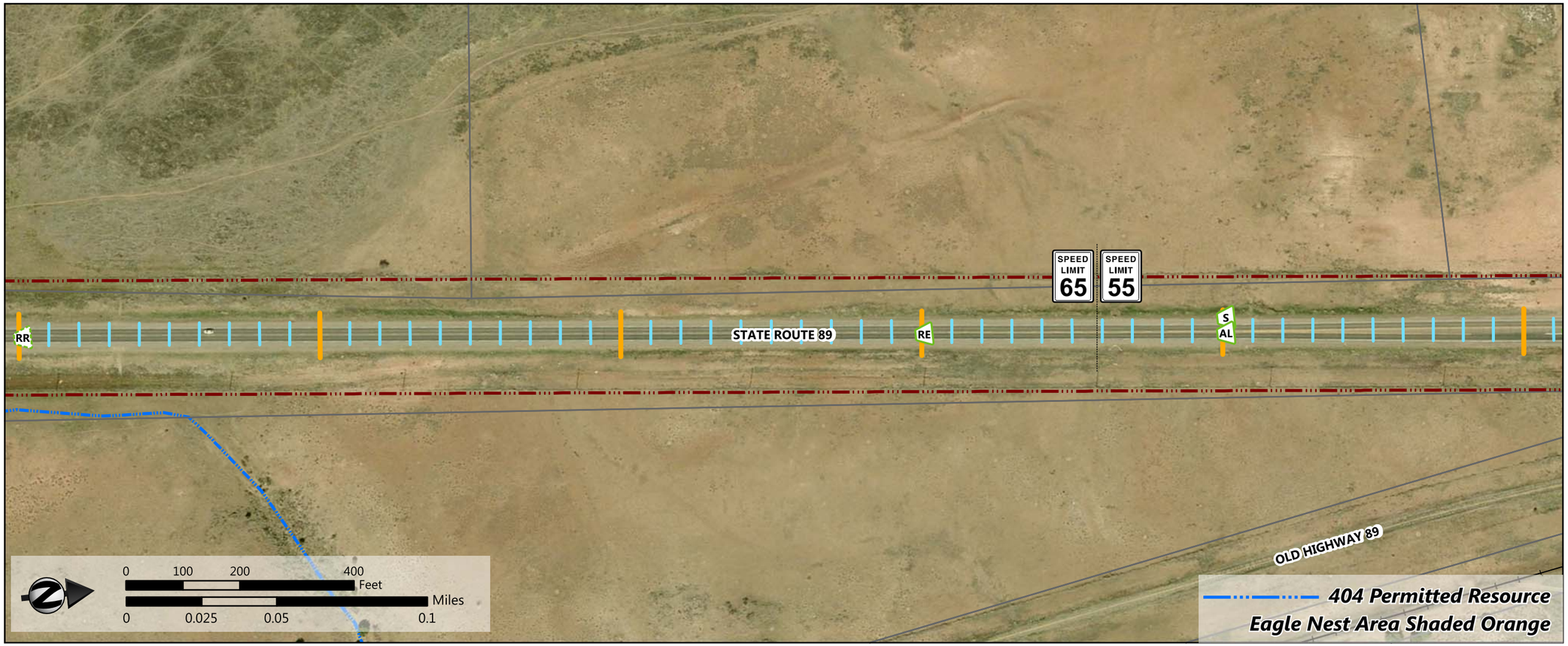
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



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CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness	x	
	Other/Unknown		
	Medications		
	Fatigue		

ROADWAY FEATURES			
Total Approximate R/W Width		200 ft	200 ft
Rumble Strip			
Roadway Grade			
Overhead Power		NB 80 FT FROM EOP	NB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

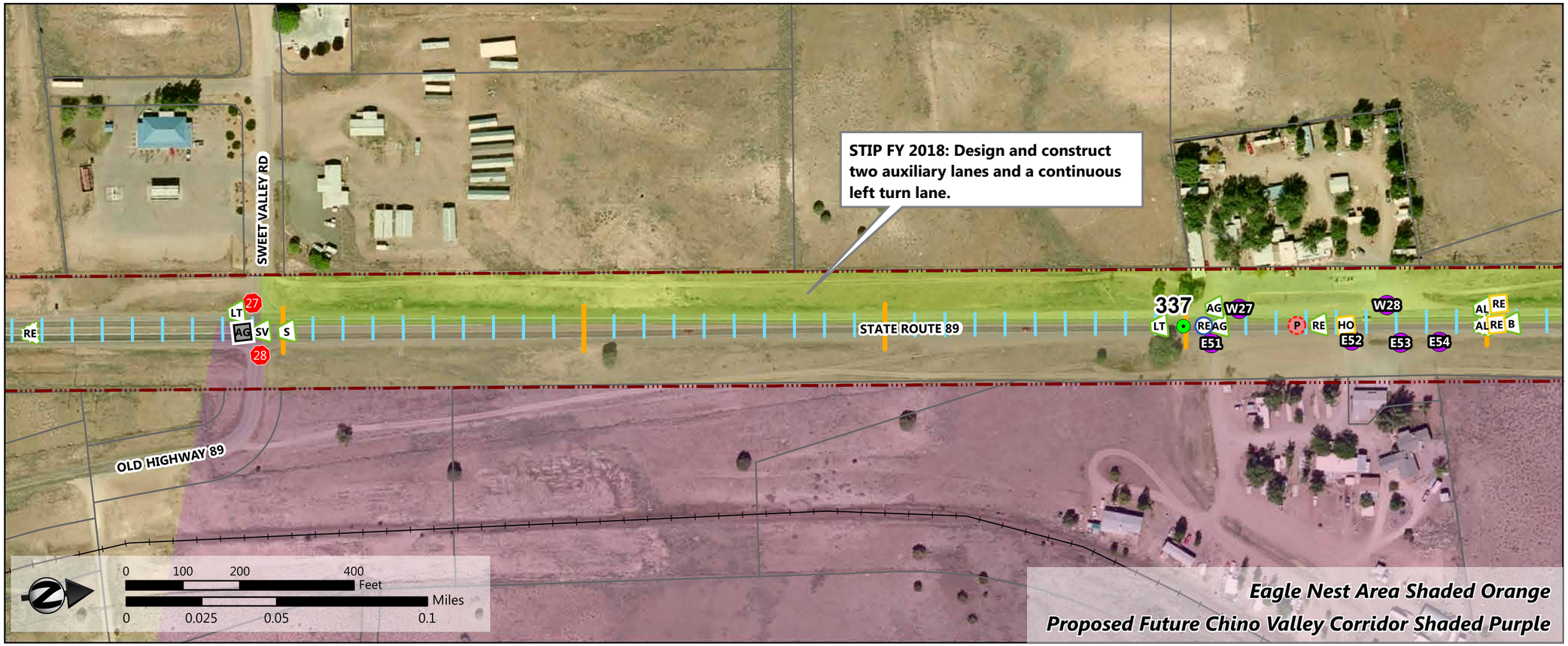
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	60%
	Incliment Weather	x x	20%
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown	x x	x
	Medications		
	Fatigue		
ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power		SB 80 FT FROM EOP	SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	10 FT	10 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	10 FT	10 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

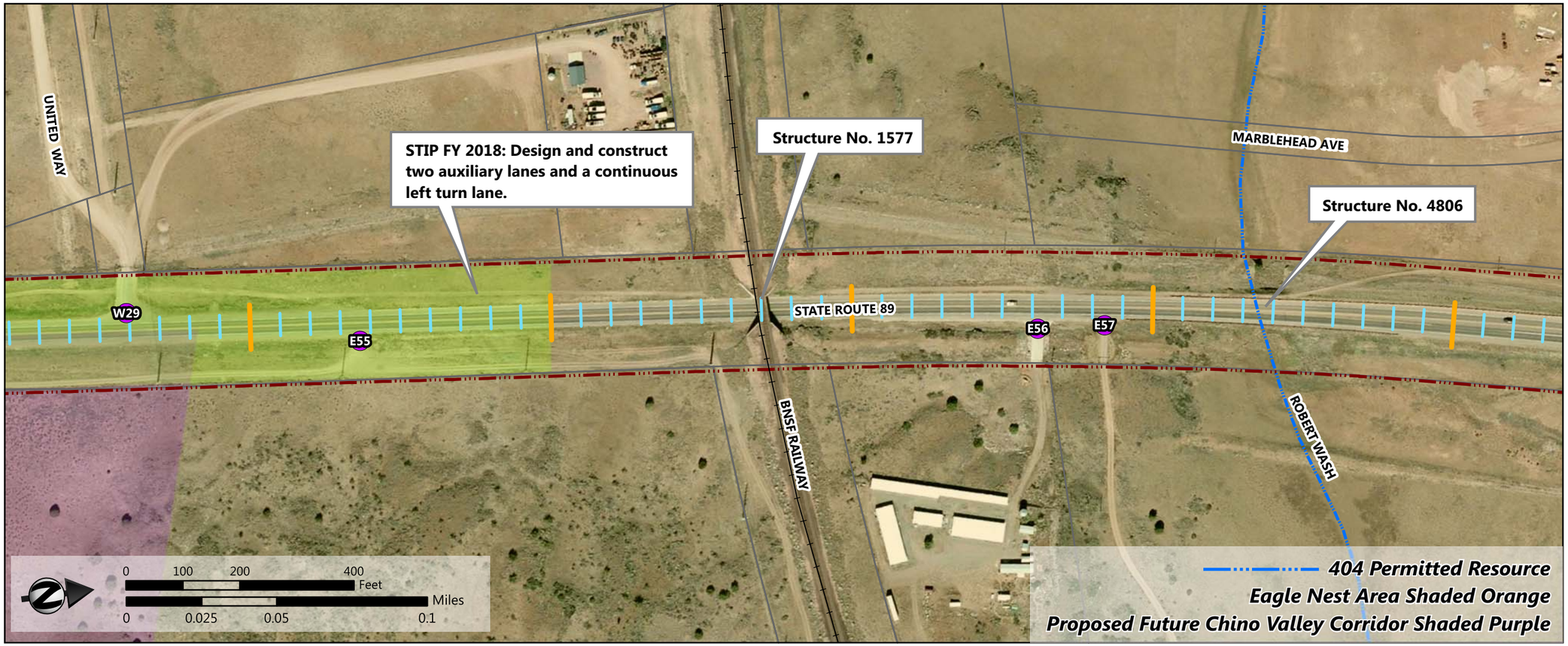
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	
	Incliment Weather	
Driver Impairment (DI)	Alcohol/Drugs	
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	
ROADWAY FEATURES		
Total Approximate R/W Width		200 FT ← → 200 FT
Rumble Strip		
Roadway Grade		
Overhead Power		SB 80 FT FROM EOP | NB AND SB 80 FT FROM EOP ← → NB AND SB 80 FT FROM EOP | SB 80 FT FROM EOP ← → SB 80 FT FROM EOP
SB	Level of Service 2016*	LOS A
	Level of Service 2036	LOS A
	Right Turn Lane	
	Shoulder	10 FT | 10 FT | 8 FT | 8 FT
	Access	
	Curb	
Centerline	Passing/No Passing	
	Left Turn Lane	
NB	Curb	
	Access	
	Shoulder	10 FT | 10 FT
	Right Turn Lane	
	Level of Service 2016*	LOS A
	Level of Service 2036	LOS A

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Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road

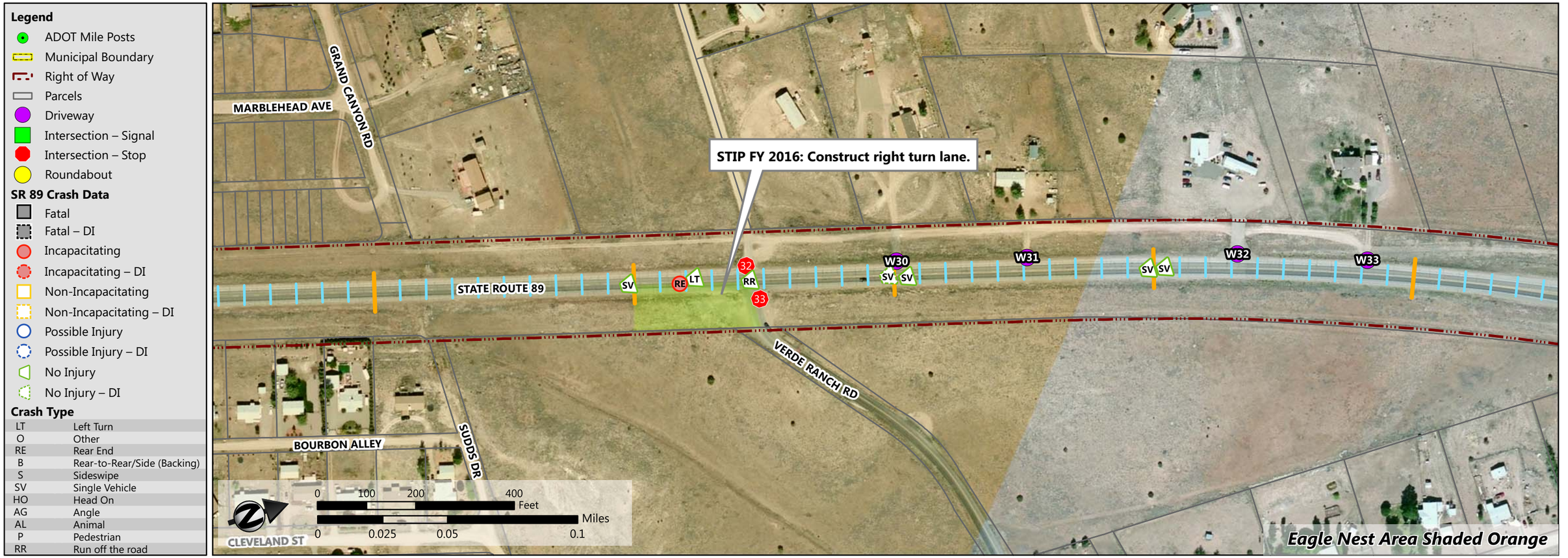
338

CRASH HISTORY (2011-2015)

Contributing Factors	Night Condition	50%; x (before MP 338)
	Incliment Weather	x (before MP 338); x (after MP 338)
Driver Impairment (DI)	Alcohol/Drugs	x
	Illness	
	Other/Unknown	x (after MP 338)
	Medications	
	Fatigue	x

ROADWAY FEATURES

Total Approximate R/W Width			200 FT ← → 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			SB 80 FT FROM EOP ← → SB 80 FT FROM EOP
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		8 FT … 8 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		10 FT … 10 FT / 8 FT … 8 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A



CRASH HISTORY (2011-2015)		
Contributing Factors	Night Condition	x
	Incliment Weather	x
Driver Impairment (DI)	Alcohol/Drugs	x
	Illness	
	Other/Unknown	
	Medications	
	Fatigue	

ROADWAY FEATURES			
Total Approximate R/W Width			200 FT ... 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		8 FT ... 8 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		8 FT ... 8 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

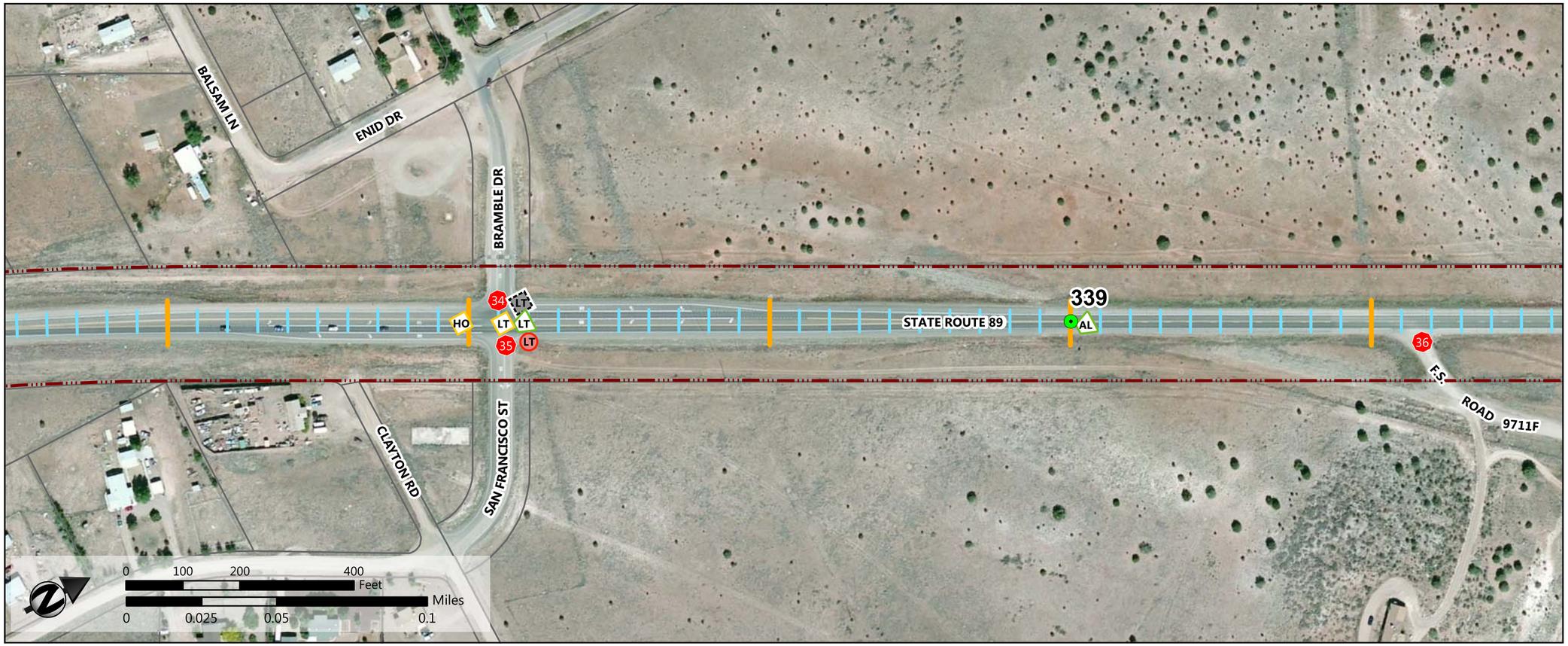
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x 25%	x
	Incliment Weather	x 25%	
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue	x	

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	8 FT	8 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	8 FT	8 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

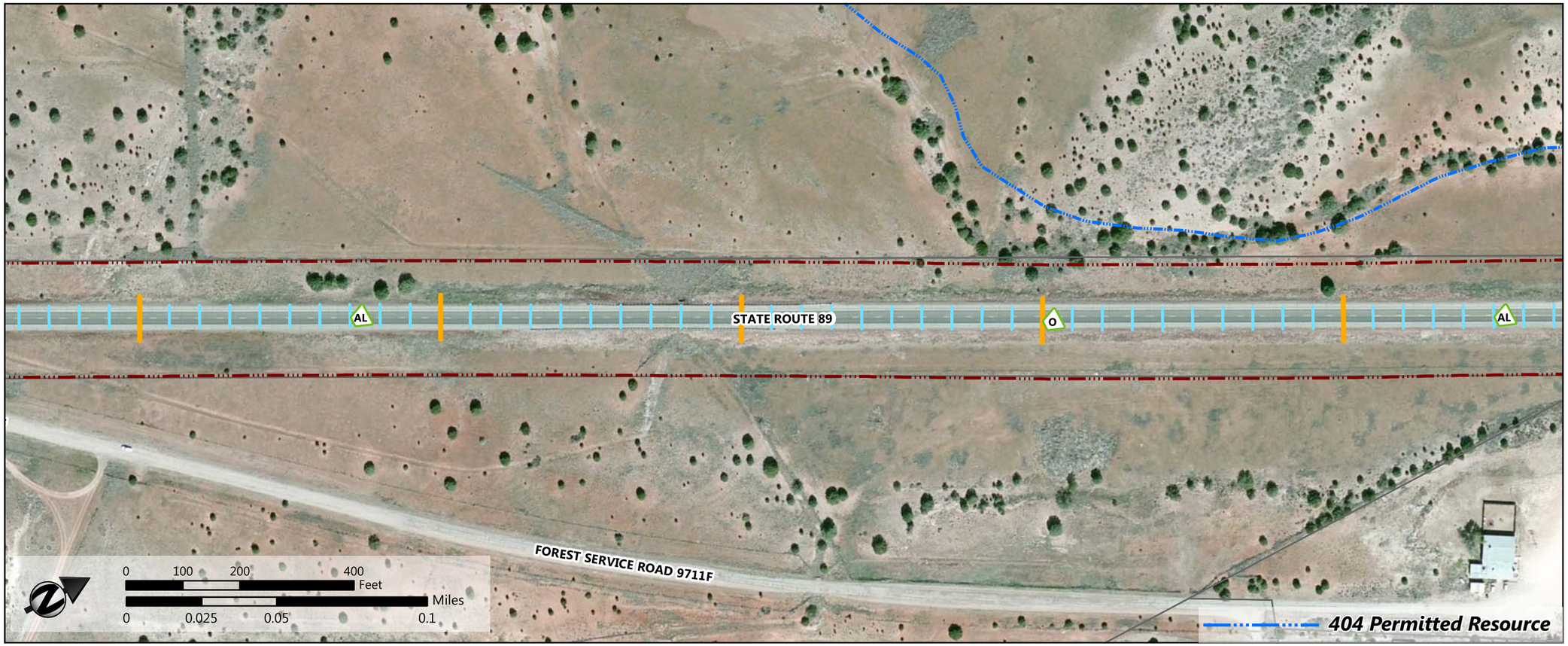
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue		

ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	8 FT	8 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	8 FT	8 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

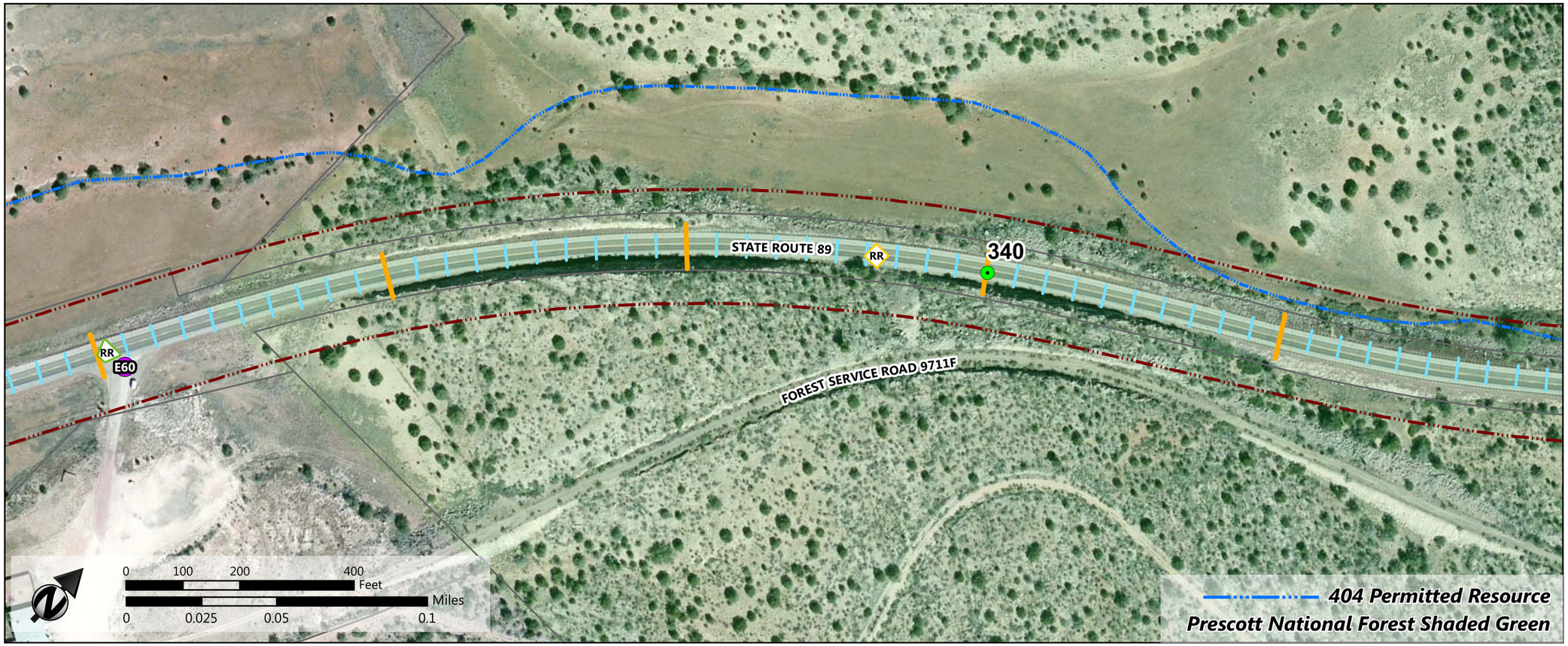
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)				
Contributing Factors	Night Condition			
	Incliment Weather	x	x	
Driver Impairment (DI)	Alcohol/Drugs			
	Illness			
	Other/Unknown			
	Medications			
	Fatigue			
ROADWAY FEATURES				
Total Approximate R/W Width		200 FT		200 FT
Rumble Strip				
Roadway Grade				
Overhead Power				
SB	Level of Service 2016*	LOS A		
	Level of Service 2036	LOS A		
	Right Turn Lane			
	Shoulder	8 FT		8 FT
	Access			
	Curb			
Centerline	Passing/No Passing			
	Left Turn Lane			
NB	Curb			
	Access			
	Shoulder	8 FT		8 FT
	Right Turn Lane			
	Level of Service 2016*	LOS A		
	Level of Service 2036	LOS A		

Legend

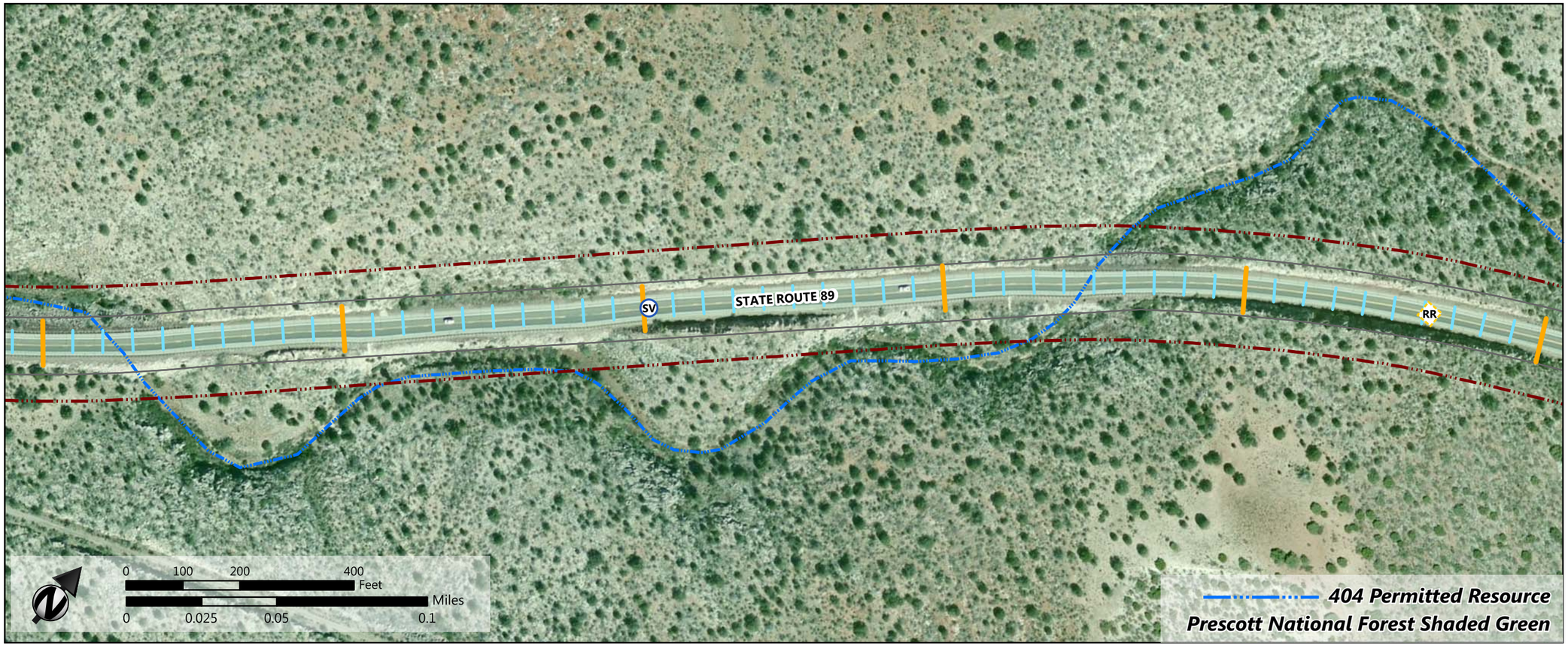
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition		x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue		x
ROADWAY FEATURES			
Total Approximate R/W Width			200 FT < > 200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service	2016*	LOS A
		2036	LOS A
	Right Turn Lane		
	Shoulder		8 FT 8 FT 6 FT 6 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder		8 FT 8 FT 6 FT 6 FT
	Right Turn Lane		
	Level of Service	2016*	LOS A
		2036	LOS A

Legend

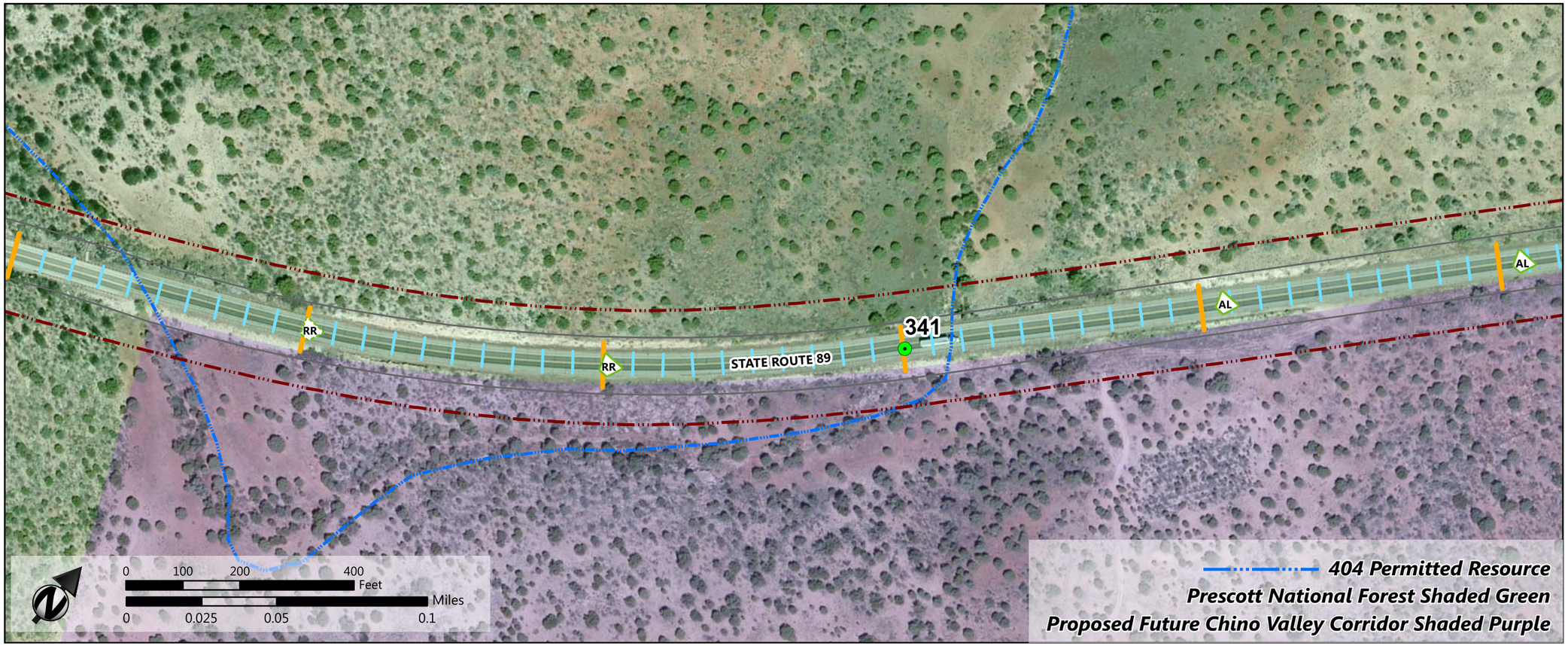
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition		x
	Incliment Weather		
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue	x	
ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	6 FT	6 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	6 FT	6 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

Legend

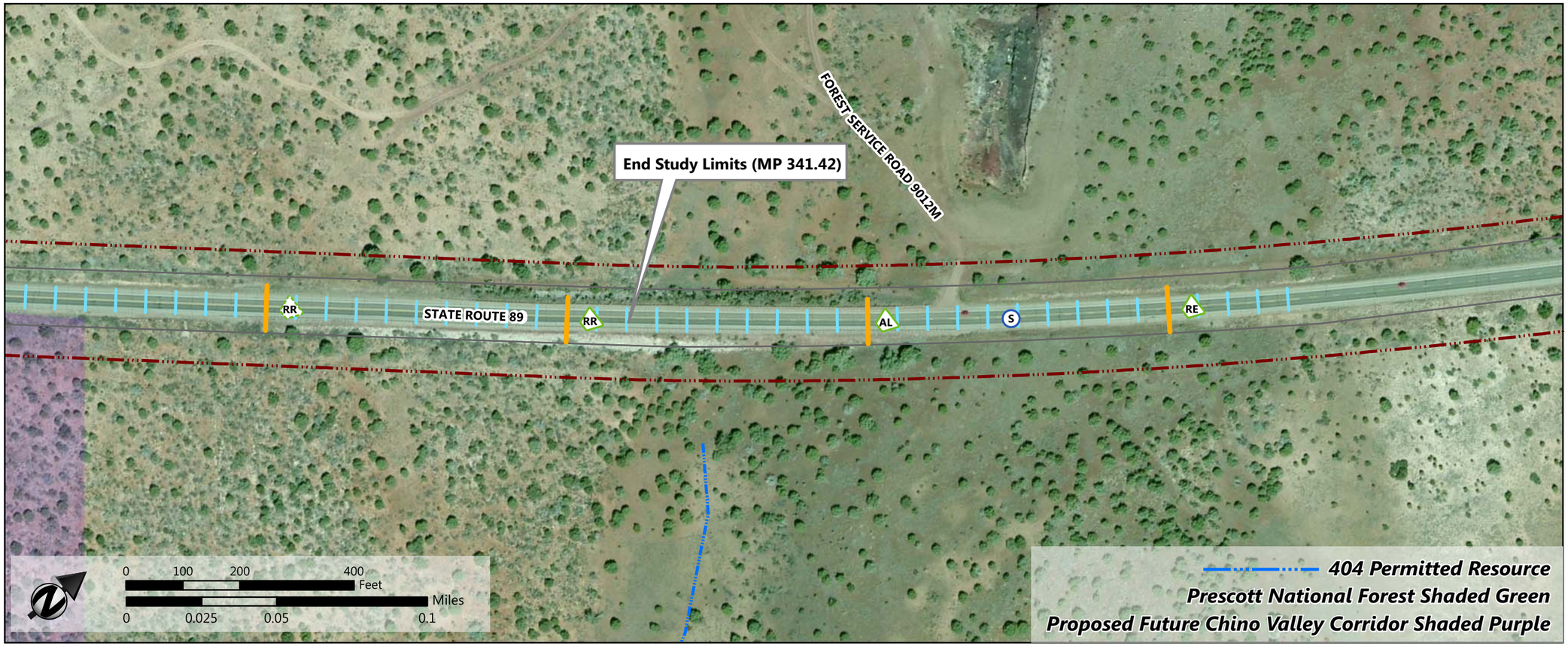
- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels
- Driveway
- Intersection – Signal
- Intersection – Stop
- Roundabout

SR 89 Crash Data

- Fatal
- Fatal – DI
- Incapacitating
- Incapacitating – DI
- Non-Incapacitating
- Non-Incapacitating – DI
- Possible Injury
- Possible Injury – DI
- No Injury
- No Injury – DI

Crash Type

LT	Left Turn
O	Other
RE	Rear End
B	Rear-to-Rear/Side (Backing)
S	Sideswipe
SV	Single Vehicle
HO	Head On
AG	Angle
AL	Animal
P	Pedestrian
RR	Run off the road



7/01/2016

CRASH HISTORY (2011-2015)			
Contributing Factors	Night Condition	x	x
	Incliment Weather	x	
Driver Impairment (DI)	Alcohol/Drugs		
	Illness		
	Other/Unknown		
	Medications		
	Fatigue	x	
ROADWAY FEATURES			
Total Approximate R/W Width		200 FT	200 FT
Rumble Strip			
Roadway Grade			
Overhead Power			
SB	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	
	Right Turn Lane		
	Shoulder	6 FT	6 FT
	Access		
	Curb		
Centerline	Passing/No Passing		
	Left Turn Lane		
NB	Curb		
	Access		
	Shoulder	6 FT	6 FT
	Right Turn Lane		
	Level of Service 2016*	LOS A	
	Level of Service 2036	LOS A	

APPENDIX WP1-2

Reference Document Catalog

SR 89 Chino Valley to Forest Boundary Tranportation Study
Reference Documents Summary Table

ID	Document				Source			
	Title	Description	Author	Dated	Provider	Contact	Date Provided	Collected By
B-001	Arizona 2014 Strategic Highway Safety Plan	statewide safety plan	various	Dec 2014	internet	N/A		DB
B-002	Chino Valley Extension Corridor Feasibility Study	feasibility study for corridor expansion from Regional Transportation Study	Civiltec/HDR	Feb 2009	internet	N/A		DB
B-003	CYMPO Regional Transportation Plan Update 2040	Update of 2011 RTP to prioritize transportation investements	CYMPO	Apr 2015	internet	N/A		DB
B-004	Town of Chino Valley General Plan 2014	Plan of improvements for growth and development	Dava & Associates	May 2014	internet	N/A		DB
B-005	FEMA Fimettes	Flood Insurance Rate Map for study area	FEMA	Sep 2010	internet	N/A		DB
B-006	Functional Classification Maps for Yavapai County and Chino Valley	Maps indicating roadway functional classification	ADOT	8/2013 and 3/2005	internet	N/A	Feb 2016	CA
B-007	ADOT 2014 AADT Report	2013 traffic volumes	ADOT	2014	internet	N/A	Feb 2016	DB
B-008	Chino Valley Unified Development Ordinance	zoning uses	RBF	N/A	internet	N/A	Feb 2016	DB
B-009	Yavapai County Comprehensive Plan	plan for future development	Yavapai County	Sep 2012	internet	N/A	Feb 2016	DB
B-010	Cable One utility info				CableOne	Johnny Cedillo	Feb 2016	DB
B-011	2015/2016 Class C Permits		ADOT	Feb 2016	ADOT	Christina Pippin	Feb 2016	DB
B-012	AASHTO US Bicycle Route System		Kimley Horn & Lee Engineering	Aug 2015	internet	N/A	Feb 2016	DB
B-013	APS utility info	overhead and underground utility information	Arizona Public Service	Feb 2016	APS	N/A	Feb 2016	CA
B-014	City's Water Service Area Within the Town of Chino Valley	Prescott water service area map	City of Prescott	Oct 2015	internet	N/A	Feb 2016	DB
B-015	Del Rio Ranch Development	Summary fact sheet						
B-016	Abra Water Company	map showing existing and proposed water line	Abra Water Company		Abra Water Co	Rod Yarbro	Mar 2016	CA
B-017	UniSource Energy	facility maps along SR 89	UniSource Energy Services	Mar 2016	UniSource Energy	Ken Manson	Mar 2016	CA
B-018	Arizona Roadway Departure Safety Implementation Plan		FHWA	May 2012	ADOT	Kohinoor Kar	Apr 2016	DB
B-019	Road 4N and Perkinsville Road Imp. Plans	line work and plans	Parsons		Parsons	Scott Sayles	Apr 2016	TC
B-020	Arizona State Highway Access Policy and Legislation Study		Lima & Associates, DMJM Harris	Mar 2001	ADOT	Dan Gabiou	Apr 2016	JP
B-021	Access Management Guidelines (draft)	ADOT draft access management guidelines	ADOT	Nov 2014	ADOT	Justin Feek	Mar 2015	JP
B-022	ADOT STIP FY 2016-2020		ADOT		internet		Apr 2016	DB
B-023	ADOT State Highway 89 As-Builts	As-builts for projects along 89	ADOT		ADOT	N/A	May 2016	DL
B-024	Fatal Crash in Paulden	News article for crash 2/26/2016	The Daily Courier	2/1/2016	internet	N/A	May 2016	CA
B-025	2014 Motor Vehicle Crash Facts for the State of Arizona		ADOT	1-Jun-15	internet	N/A	May 2016	DB
B-026	Yavapai Regional Transit, Inc.	transit maps, flyer regarding service to Paulden	Yavapai Regional Transit, Inc.		internet	N/A	May 2016	DL
B-027	Del Rio Ranch Development Information	Council Meeting summaries, Preliminary Plat cover, etc.	various	various	Chino Valley	James Gardner	May 2016	DB
B-028	Pavement Data	pavement quality and composition	ADOT		ADOT	Ali Zareh	May 2016	DL
B-029	Inspection Reports	inspection reports for structures and culverts	ADOT		ADOT	Verna Celeya	May 2016	DL
B-030	Statewide Wildlife Crash Analysis and Proposed Action Plan		ADOT	Sept. 2014	AZTEC	Justin Hoppmann	Jun-16	DB
B-031	CYMPO Title VI Plan		CYMPO	Jun 2016	CYMPO	Chris Bridges	Jun-16	DB

APPENDIX WP1-3

Existing Traffic Counts

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602329
Route: AZ-89 (set 300' n/o 3N)
Location: N of E RD 3 N

Site Ref: 1
Direction: NB
Latitude: 34.77844
Longitude: -112.45279

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	3	0	1	1	0	0	0	0	0	0	0	1	0	0	0.0%	33.3%
3/23/2016 0:15	4	0	2	1	0	0	0	0	0	1	0	0	0	0	0.0%	25.0%
3/23/2016 0:30	10	0	3	4	0	0	0	0	0	3	0	0	0	0	0.0%	30.0%
3/23/2016 0:45	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:00	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:15	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 1:30	5	0	3	1	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
3/23/2016 1:45	5	0	2	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 2:00	6	0	1	3	0	0	0	0	0	2	0	0	0	0	0.0%	33.3%
3/23/2016 2:15	3	0	1	0	0	1	0	0	0	1	0	0	0	0	33.3%	33.3%
3/23/2016 2:30	6	0	3	1	0	0	0	0	0	2	0	0	0	0	0.0%	33.3%
3/23/2016 2:45	12	0	5	3	0	0	0	0	0	3	0	1	0	0	0.0%	33.3%
3/23/2016 3:00	5	0	1	2	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 3:15	5	0	2	1	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 3:30	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 3:45	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 4:00	6	0	2	2	0	0	0	0	0	1	0	1	0	0	0.0%	33.3%
3/23/2016 4:15	8	0	2	4	0	0	0	0	0	2	0	0	0	0	0.0%	25.0%
3/23/2016 4:30	13	1	5	4	0	1	0	0	0	1	0	1	0	0	7.7%	15.4%
3/23/2016 4:45	13	0	6	6	0	0	0	0	0	1	0	0	0	0	0.0%	7.7%
3/23/2016 5:00	14	0	7	6	0	0	0	0	0	0	0	1	0	0	0.0%	7.1%
3/23/2016 5:15	21	1	7	12	0	0	0	0	1	0	0	0	0	0	0.0%	4.8%
3/23/2016 5:30	34	0	14	18	0	1	0	0	0	1	0	0	0	0	2.9%	2.9%
3/23/2016 5:45	26	0	10	12	0	1	0	0	0	3	0	0	0	0	3.8%	11.5%
3/23/2016 6:00	50	0	27	22	0	1	0	0	0	0	0	0	0	0	2.0%	0.0%
3/23/2016 6:15	52	1	17	23	3	1	2	0	0	5	0	0	0	0	11.5%	9.6%
3/23/2016 6:30	61	1	24	28	4	3	0	0	0	1	0	0	0	0	11.5%	1.6%
3/23/2016 6:45	69	0	36	23	5	1	0	1	0	3	0	0	0	0	10.1%	4.3%
3/23/2016 7:00	61	0	28	25	3	3	0	0	1	1	0	0	0	0	9.8%	3.3%
3/23/2016 7:15	92	0	55	30	2	1	1	0	0	2	0	0	0	1	4.3%	3.3%
3/23/2016 7:30	73	0	39	30	2	1	0	0	0	0	0	0	0	1	4.1%	1.4%
3/23/2016 7:45	90	0	40	43	2	1	1	2	0	1	0	0	0	0	6.7%	1.1%
3/23/2016 8:00	71	0	35	29	1	0	0	0	2	2	0	1	0	1	1.4%	8.5%
3/23/2016 8:15	74	0	33	35	1	1	0	0	0	3	0	0	0	1	2.7%	5.4%
3/23/2016 8:30	67	0	35	26	0	1	0	0	0	4	0	0	0	1	1.5%	7.5%
3/23/2016 8:45	81	0	54	25	1	0	0	0	1	0	0	0	0	0	1.2%	1.2%
3/23/2016 9:00	90	0	40	44	0	2	2	1	1	0	0	0	0	0	5.6%	1.1%
3/23/2016 9:15	71	0	29	35	0	0	0	1	1	5	0	0	0	0	1.4%	8.5%
3/23/2016 9:30	77	1	30	35	3	0	0	0	3	5	0	0	0	0	3.9%	10.4%
3/23/2016 9:45	82	1	45	33	0	0	0	0	1	2	0	0	0	0	0.0%	3.7%
3/23/2016 10:00	88	0	43	38	2	0	0	0	0	5	0	0	0	0	2.3%	5.7%
3/23/2016 10:15	102	0	51	41	2	2	0	0	2	4	0	0	0	0	3.9%	5.9%
3/23/2016 10:30	87	0	39	44	0	1	0	2	1	0	0	0	0	0	3.4%	1.1%
3/23/2016 10:45	92	2	36	47	0	1	0	0	0	4	1	1	0	0	1.1%	6.5%
3/23/2016 11:00	88	4	37	39	1	2	0	0	0	4	1	0	0	0	3.4%	5.7%
3/23/2016 11:15	96	1	53	38	1	1	0	0	0	2	0	0	0	0	2.1%	2.1%
3/23/2016 11:30	101	0	48	44	0	1	2	2	0	4	0	0	0	0	5.0%	4.0%
3/23/2016 11:45	90	3	52	34	0	0	0	0	0	1	0	0	0	0	0.0%	1.1%

Traffic Research & Analysis, Inc.
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Route: AZ-89 (set 300' n/o 3N)
Location: N of E RD 3 N

Site Ref: 1
Direction: NB
Latitude: 34.77844
Longitude: -112.45279

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	104	1	41	54	0	1	3	1	0	3	0	0	0	0	4.8%	2.9%
3/23/2016 12:15	86	1	34	47	1	0	2	0	0	1	0	0	0	0	3.5%	1.2%
3/23/2016 12:30	97	0	47	45	0	3	0	0	1	1	0	0	0	0	3.1%	2.1%
3/23/2016 12:45	112	1	58	50	1	0	0	0	0	2	0	0	0	0	0.9%	1.8%
3/23/2016 13:00	118	1	55	55	2	0	1	0	0	4	0	0	0	0	2.5%	3.4%
3/23/2016 13:15	119	0	58	52	4	3	1	0	0	1	0	0	0	0	6.7%	0.8%
3/23/2016 13:30	120	2	63	51	3	0	0	0	0	1	0	0	0	0	2.5%	0.8%
3/23/2016 13:45	109	0	59	47	0	1	2	0	0	0	0	0	0	0	2.8%	0.0%
3/23/2016 14:00	111	1	57	46	1	0	1	1	0	4	0	0	0	0	2.7%	3.6%
3/23/2016 14:15	129	0	74	49	0	3	0	0	0	3	0	0	0	0	2.3%	2.3%
3/23/2016 14:30	132	0	71	55	1	2	1	0	1	1	0	0	0	0	3.0%	1.5%
3/23/2016 14:45	131	1	72	53	0	1	0	0	2	2	0	0	0	0	0.8%	3.1%
3/23/2016 15:00	119	2	61	48	5	2	0	0	0	1	0	0	0	0	5.9%	0.8%
3/23/2016 15:15	140	1	88	47	1	1	0	0	0	2	0	0	0	0	1.4%	1.4%
3/23/2016 15:30	140	0	83	54	0	1	0	0	0	2	0	0	0	0	0.7%	1.4%
3/23/2016 15:45	136	2	72	58	1	2	0	0	0	1	0	0	0	0	2.2%	0.7%
3/23/2016 16:00	163	1	86	72	2	1	0	0	0	1	0	0	0	0	1.8%	0.6%
3/23/2016 16:15	141	1	79	54	0	4	1	0	0	2	0	0	0	0	3.5%	1.4%
3/23/2016 16:30	163	2	87	69	1	1	0	0	0	2	0	1	0	0	1.2%	1.8%
3/23/2016 16:45	148	0	82	58	0	5	0	0	1	2	0	0	0	0	3.4%	2.0%
3/23/2016 17:00	153	0	82	62	0	2	0	2	0	4	0	1	0	0	2.6%	3.3%
3/23/2016 17:15	140	0	68	67	0	2	1	0	0	2	0	0	0	0	2.1%	1.4%
3/23/2016 17:30	154	0	88	66	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 17:45	148	1	73	72	0	1	0	0	0	1	0	0	0	0	0.7%	0.7%
3/23/2016 18:00	135	0	88	45	0	2	0	0	0	0	0	0	0	0	1.5%	0.0%
3/23/2016 18:15	119	1	60	53	1	0	0	0	0	4	0	0	0	0	0.8%	3.4%
3/23/2016 18:30	119	0	74	44	0	0	1	0	0	0	0	0	0	0	0.8%	0.0%
3/23/2016 18:45	74	0	30	43	1	0	0	0	0	0	0	0	0	0	1.4%	0.0%
3/23/2016 19:00	71	0	38	32	0	0	0	0	0	1	0	0	0	0	0.0%	1.4%
3/23/2016 19:15	79	0	50	28	0	1	0	0	0	0	0	0	0	0	1.3%	0.0%
3/23/2016 19:30	60	0	33	26	0	0	0	0	0	1	0	0	0	0	0.0%	1.7%
3/23/2016 19:45	69	0	41	26	0	0	0	0	0	2	0	0	0	0	0.0%	2.9%
3/23/2016 20:00	61	0	30	31	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:15	59	0	39	17	0	1	0	0	0	2	0	0	0	0	1.7%	3.4%
3/23/2016 20:30	50	0	25	24	0	0	0	0	1	0	0	0	0	0	0.0%	2.0%
3/23/2016 20:45	50	0	30	18	0	0	0	0	0	2	0	0	0	0	0.0%	4.0%
3/23/2016 21:00	42	0	28	13	0	0	0	0	0	1	0	0	0	0	0.0%	2.4%
3/23/2016 21:15	31	0	17	13	0	0	0	0	0	1	0	0	0	0	0.0%	3.2%
3/23/2016 21:30	40	0	26	14	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:45	39	0	23	15	0	0	0	0	0	1	0	0	0	0	0.0%	2.6%
3/23/2016 22:00	22	0	10	11	0	0	0	0	0	1	0	0	0	0	0.0%	4.5%
3/23/2016 22:15	29	0	18	11	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:30	25	0	18	7	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:45	17	0	8	8	0	0	0	0	0	1	0	0	0	0	0.0%	5.9%
3/23/2016 23:00	11	0	10	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:15	10	0	9	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:30	16	0	9	6	0	0	0	0	0	1	0	0	0	0	0.0%	6.3%
3/23/2016 23:45	12	0	8	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
Day Totals	**6470**	**35**	**3370**	**2722**	**58**	**68**	**22**	**13**	**20**	**146**	**2**	**9**	**0**	**5**	**2.5%**	**2.8%**

AM Peak Hr	**11:15 AM**
AM Peak Vol	**391**
AM PHF	**0.940**
PM Peak Hr	**4:00 PM**
PM Peak Vol	**615**
PM PHF	**0.943**

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Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	3	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0
3/23/2016 0:15	4	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0
3/23/2016 0:30	10	0	0	0	0	0	0	0	1	1	0	3	4	1	0	0	0	0
3/23/2016 0:45	4	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0
3/23/2016 1:00	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
3/23/2016 1:15	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
3/23/2016 1:30	5	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0	0	0
3/23/2016 1:45	5	0	0	0	0	0	0	0	0	1	1	2	1	0	0	0	0	0
3/23/2016 2:00	6	0	0	0	0	0	0	0	0	0	3	1	0	1	1	0	0	0
3/23/2016 2:15	3	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0
3/23/2016 2:30	6	0	0	0	0	0	0	0	0	1	0	4	1	0	0	0	0	0
3/23/2016 2:45	12	0	0	0	0	0	0	0	0	0	2	5	3	2	0	0	0	0
3/23/2016 3:00	5	0	0	0	0	0	0	0	0	0	1	0	1	2	1	0	0	0
3/23/2016 3:15	5	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0
3/23/2016 3:30	3	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
3/23/2016 3:45	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
3/23/2016 4:00	6	0	0	0	0	0	0	0	1	0	0	2	1	2	0	0	0	0
3/23/2016 4:15	8	0	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0
3/23/2016 4:30	13	0	0	0	0	0	0	0	0	0	1	4	3	4	1	0	0	0
3/23/2016 4:45	13	0	0	0	0	0	0	0	0	0	1	4	6	2	0	0	0	0
3/23/2016 5:00	14	0	0	0	0	0	0	0	0	0	3	5	2	0	4	0	0	0
3/23/2016 5:15	21	0	0	0	0	0	0	0	0	1	4	8	5	3	0	0	0	0
3/23/2016 5:30	34	0	0	0	0	0	0	0	0	4	4	16	7	2	1	0	0	0
3/23/2016 5:45	26	0	0	0	0	0	0	0	0	2	6	11	7	0	0	0	0	0
3/23/2016 6:00	50	0	0	0	0	0	0	0	0	5	16	19	7	3	0	0	0	0
3/23/2016 6:15	52	0	0	0	0	0	0	0	0	1	14	23	11	3	0	0	0	0
3/23/2016 6:30	61	0	0	0	0	0	0	0	0	3	15	20	18	4	1	0	0	0
3/23/2016 6:45	69	0	0	0	0	0	0	0	0	3	13	27	19	7	0	0	0	0
3/23/2016 7:00	61	0	0	0	0	0	0	0	0	2	13	25	17	4	0	0	0	0
3/23/2016 7:15	92	0	0	0	0	0	0	0	0	1	17	46	24	4	0	0	0	0
3/23/2016 7:30	73	0	0	0	0	0	0	0	0	2	13	28	23	6	1	0	0	0
3/23/2016 7:45	90	0	0	0	0	0	0	0	1	6	14	37	20	12	0	0	0	0
3/23/2016 8:00	71	0	0	0	0	0	0	0	2	4	14	38	11	1	1	0	0	0
3/23/2016 8:15	74	0	0	0	0	0	0	0	0	3	23	28	16	4	0	0	0	0
3/23/2016 8:30	67	0	0	0	0	0	0	0	0	1	17	26	17	5	1	0	0	0
3/23/2016 8:45	81	0	0	0	0	0	0	0	0	9	22	32	15	3	0	0	0	0
3/23/2016 9:00	90	0	0	0	0	0	0	0	0	9	23	31	24	2	0	1	0	0
3/23/2016 9:15	71	0	0	0	0	0	0	1	2	11	15	21	15	5	1	0	0	0
3/23/2016 9:30	77	0	0	0	0	0	0	0	0	4	23	34	13	3	0	0	0	0
3/23/2016 9:45	82	0	0	0	0	0	0	0	1	14	31	24	12	0	0	0	0	0
3/23/2016 10:00	88	0	0	0	0	0	0	0	1	9	25	34	17	2	0	0	0	0
3/23/2016 10:15	102	0	0	0	0	0	0	0	1	8	29	50	12	2	0	0	0	0
3/23/2016 10:30	87	0	0	0	0	0	0	0	0	6	24	37	18	2	0	0	0	0
3/23/2016 10:45	92	0	0	0	0	0	0	0	0	9	32	35	12	4	0	0	0	0
3/23/2016 11:00	88	0	0	0	0	0	0	0	0	6	23	31	24	4	0	0	0	0
3/23/2016 11:15	96	0	0	0	0	0	0	0	1	12	22	40	20	1	0	0	0	0
3/23/2016 11:30	101	0	0	0	0	0	0	0	0	8	27	32	25	8	0	1	0	0
3/23/2016 11:45	90	0	0	0	0	0	0	0	0	3	16	46	18	6	1	0	0	0
3/23/2016 12:00	104	0	0	0	0	0	0	0	1	10	30	44	17	2	0	0	0	0
3/23/2016 12:15	86	0	0	0	0	0	0	0	1	2	35	33	12	2	1	0	0	0
3/23/2016 12:30	97	0	0	0	0	0	0	0	2	9	16	39	23	7	0	0	1	0
3/23/2016 12:45	112	0	0	0	0	0	0	0	2	6	25	51	21	4	3	0	0	0
3/23/2016 13:00	118	0	0	0	0	0	0	0	0	7	31	52	25	3	0	0	0	0
3/23/2016 13:15	119	0	0	0	0	0	0	0	0	4	29	51	27	7	1	0	0	0
3/23/2016 13:30	120	0	0	0	0	0	0	0	0	3	42	46	19	8	2	0	0	0
3/23/2016 13:45	109	0	0	0	0	0	0	0	0	9	33	46	18	3	0	0	0	0
3/23/2016 14:00	111	0	0	0	0	0	0	0	0	9	31	39	25	7	0	0	0	0
3/23/2016 14:15	129	0	0	0	0	0	0	0	2	5	45	39	36	2	0	0	0	0
3/23/2016 14:30	132	0	0	0	0	0	0	0	2	9	42	52	19	7	1	0	0	0
3/23/2016 14:45	131	0	0	0	0	0	0	0	1	13	32	53	20	12	0	0	0	0
3/23/2016 15:00	119	0	0	0	0	0	0	0	3	3	29	54	25	5	0	0	0	0
3/23/2016 15:15	140	0	0	0	0	0	0	0	0	8	44	57	27	4	0	0	0	0
3/23/2016 15:30	140	0	0	0	0	0	0	0	7	10	32	57	32	2	0	0	0	0
3/23/2016 15:45	136	0	0	0	0	0	0	0	1	5	30	67	23	10	0	0	0	0
3/23/2016 16:00	163	0	0	0	0	0	0	0	1	19	55	58	24	6	0	0	0	0
3/23/2016 16:15	141	0	0	0	0	0	0	0	2	12	37	58	28	4	0	0	0	0
3/23/2016 16:30	163	0	0	0	0	0	0	2	3	11	46	63	30	7	1	0	0	0
3/23/2016 16:45	148	0	0	0	0	0	0	0	2	9	29	76	23	8	1	0	0	0
3/23/2016 17:00	153	0	0	0	0	0	0	0	3	15	48	46	33	8	0	0	0	0
3/23/2016 17:15	140	0	0	0	0	0	0	0	0	7	38	49	37	9	0	0	0	0
3/23/2016 17:30	154	0	0	0	0	0	0	0	0	7	30	65	51	1	0	0	0	0
3/23/2016 17:45	148	0	0	0	0	0	0	0	0	0	28	75	34	10	1	0	0	0
3/23/2016 18:00	135	0	0	0	0	0	0	0	0	4	22	64	35	9	1	0	0	0
3/23/2016 18:15	119	0	0	0	0	0	0	0	1	3	34	45	25	11	0	0	0	0
3/23/2016 18:30	119	0	0	0	0	0	0	0	0	4	32	56	16	11	0	0	0	0
3/23/2016 18:45	74	0	0	0	0	0	0	0	0	4	15	30	17	7	1	0	0	0
3/23/2016 19:00	71	0	0	0	0	0	0	0	1	5	17	30	15	3	0	0	0	0
3/23/2016 19:15	79	0	0	0	0	0	0	0	1	5	26	26	20	1	0	0	0	0
3/23/2016 19:30	60	0	0	0	0	0	0	0	0	2	19	23	11	5	0	0	0	0
3/23/2016 19:45	69	0	0	0	0	0	0	0	0	2	21	29	13	4	0	0	0	0
3/23/2016 20:00	61	0	0	0	0	0	0	0	0	3	18	24	14	2	0	0	0	0
3/23/2016 20:15	59	0	0	0	0	0	0	0	0	3	12	24	15	4	1	0	0	0
3/23/2016 20:30	50	0	0	0	0	0	0	0	0	1	16	17	14	2	0	0	0	0
3/23/2016 20:45	50	0	0	0	0	0	0	0	0	1	7	20	16	4	2	0	0	0
3/23/2016 21:00	42	0	0	0	0	0	0	0	0	6	4	13	16	3	0	0	0	0

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client:	Burgess & Niple, Inc.	Site Ref:	1
File Number:	1602329	Direction:	NB
Route:	AZ-89 (set 300' n/o 3N)	Latitude:	34.77844
Location:	N of E RD 3 N	Longitude:	-112.45279

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	31	0	0	0	0	0	0	0	0	2	6	12	8	3	0	0	0	0
3/23/2016 21:30	40	0	0	0	0	0	0	0	0	4	9	15	11	1	0	0	0	0
3/23/2016 21:45	39	0	0	0	0	0	0	0	0	5	2	14	17	1	0	0	0	0
3/23/2016 22:00	22	0	0	0	0	0	0	0	0	2	3	11	6	0	0	0	0	0
3/23/2016 22:15	29	0	0	0	0	0	0	0	1	4	8	6	5	5	0	0	0	0
3/23/2016 22:30	25	0	0	0	0	0	0	0	0	1	1	7	14	2	0	0	0	0
3/23/2016 22:45	17	0	0	0	0	0	0	0	0	0	3	6	4	2	2	0	0	0
3/23/2016 23:00	11	0	0	0	0	0	0	0	0	1	2	1	6	1	0	0	0	0
3/23/2016 23:15	10	0	0	0	0	0	0	0	0	0	1	5	4	0	0	0	0	0
3/23/2016 23:30	16	0	0	0	0	0	0	0	0	0	3	6	6	1	0	0	0	0
3/23/2016 23:45	12	0	0	0	0	0	0	0	0	0	2	8	1	1	0	0	0	0
Day Totals	**6470**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**48**	**404**	**1633**	**2601**	**1402**	**344**	**32**	**2**	**1**	**0**

AM Peak Hr	**11:15 AM**	Average Speed	**52.2**	Pct > 25 mph	**100%**
AM Peak Vol	**391**	Median Speed	**52.2**	Pct > 30 mph	**100%**
AM PHF	**0.940**	85th Pct Speed	**57.8**	Pct > 35 mph	**100%**
PM Peak Hr	**4:00 PM**	95th Pct Speed	**60.7**	Pct > 40 mph	**99%**
PM Peak Vol	**615**	Pace Speed	**45**	Pct > 45 mph	**93%**
PM PHF	**0.943**	Percent in Pace	**64.8%**	Pct > 50 mph	**68%**
		Speed Limit	**35**		
		Percent Speedin	**100.0%**		

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602330
Route: AZ-89 (set 300' n/o 3N)
Location: N of E RD 3 N

Site Ref: 1
Direction: SB
Latitude: 34.77844
Longitude: -112.45279

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	6	0	4	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:15	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:30	8	0	6	1	1	0	0	0	0	0	0	0	0	0	12.5%	0.0%
3/23/2016 0:45	4	0	3	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:00	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0.0%	50.0%
3/23/2016 1:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:30	10	1	3	4	0	0	0	0	0	2	0	0	0	0	0.0%	20.0%
3/23/2016 1:45	5	0	2	1	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 2:00	9	0	4	4	0	0	0	0	0	1	0	0	0	0	0.0%	11.1%
3/23/2016 2:15	9	0	5	3	0	0	0	0	0	1	0	0	0	0	0.0%	11.1%
3/23/2016 2:30	8	0	4	3	0	0	0	0	0	1	0	0	0	0	0.0%	12.5%
3/23/2016 2:45	7	0	1	5	0	0	0	0	0	1	0	0	0	0	0.0%	14.3%
3/23/2016 3:00	5	0	1	2	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 3:15	12	0	9	2	0	0	0	0	0	1	0	0	0	0	0.0%	8.3%
3/23/2016 3:30	8	0	5	1	0	0	0	0	0	2	0	0	0	0	0.0%	25.0%
3/23/2016 3:45	6	0	2	2	0	0	0	0	0	2	0	0	0	0	0.0%	33.3%
3/23/2016 4:00	16	0	8	7	0	0	0	0	0	0	0	1	0	0	0.0%	6.3%
3/23/2016 4:15	22	0	11	7	0	0	0	0	0	4	0	0	0	0	0.0%	18.2%
3/23/2016 4:30	19	1	11	5	0	0	1	0	0	0	0	1	0	0	5.3%	5.3%
3/23/2016 4:45	16	0	7	6	0	0	0	0	0	3	0	0	0	0	0.0%	18.8%
3/23/2016 5:00	34	0	17	16	0	0	0	0	0	0	0	1	0	0	0.0%	2.9%
3/23/2016 5:15	36	0	21	13	0	0	0	0	0	2	0	0	0	0	0.0%	5.6%
3/23/2016 5:30	55	0	27	24	1	0	0	0	0	3	0	0	0	0	1.8%	5.5%
3/23/2016 5:45	75	0	39	32	0	1	0	0	0	2	0	1	0	0	1.3%	4.0%
3/23/2016 6:00	68	0	38	28	1	0	1	0	0	0	0	0	0	0	2.9%	0.0%
3/23/2016 6:15	102	0	63	38	0	1	0	0	0	0	0	0	0	0	1.0%	0.0%
3/23/2016 6:30	120	0	60	56	0	1	1	0	0	2	0	0	0	0	1.7%	1.7%
3/23/2016 6:45	129	0	74	50	0	1	0	0	0	3	0	1	0	0	0.8%	3.1%
3/23/2016 7:00	157	0	96	55	3	0	1	0	0	1	0	1	0	0	2.5%	1.3%
3/23/2016 7:15	157	1	81	70	1	1	0	0	0	2	0	0	0	1	1.3%	1.9%
3/23/2016 7:30	115	1	64	49	0	0	0	0	0	1	0	0	0	0	0.0%	0.9%
3/23/2016 7:45	132	1	70	57	0	1	0	0	0	3	0	0	0	0	0.8%	2.3%
3/23/2016 8:00	125	1	64	49	2	4	1	0	0	4	0	0	0	0	5.6%	3.2%
3/23/2016 8:15	130	0	77	45	2	0	0	1	1	3	0	1	0	0	2.3%	3.8%
3/23/2016 8:30	103	0	51	44	3	0	0	0	0	5	0	0	0	0	2.9%	4.9%
3/23/2016 8:45	108	0	56	47	0	1	0	0	0	3	0	0	0	1	0.9%	3.7%
3/23/2016 9:00	105	0	63	36	0	0	0	1	2	2	1	0	0	0	1.0%	4.8%
3/23/2016 9:15	122	1	65	45	2	1	2	0	0	6	0	0	0	0	4.1%	4.9%
3/23/2016 9:30	96	0	48	43	0	0	1	0	1	3	0	0	0	0	1.0%	4.2%
3/23/2016 9:45	119	0	70	44	1	0	1	0	0	2	0	1	0	0	1.7%	2.5%
3/23/2016 10:00	97	0	49	44	1	0	1	0	1	1	0	0	0	0	2.1%	2.1%
3/23/2016 10:15	99	0	57	36	0	3	1	0	0	2	0	0	0	0	4.0%	2.0%
3/23/2016 10:30	132	0	69	53	1	2	2	0	1	3	0	0	0	1	3.8%	3.8%
3/23/2016 10:45	96	0	46	44	1	0	1	1	1	2	0	0	0	0	3.1%	3.1%
3/23/2016 11:00	106	0	62	38	0	3	2	0	0	1	0	0	0	0	4.7%	0.9%
3/23/2016 11:15	131	0	53	67	1	3	1	1	1	4	0	0	0	0	4.6%	3.8%
3/23/2016 11:30	95	0	44	43	4	2	0	0	0	1	1	0	0	0	6.3%	2.1%
3/23/2016 11:45	103	1	46	52	0	0	1	1	0	2	0	0	0	0	1.9%	1.9%

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Client: Burgess & Niple, Inc.
File Number: 1602330
Route: AZ-89 (set 300' n/o 3N)
Location: N of E RD 3 N

Site Ref: 1
Direction: SB
Latitude: 34.77844
Longitude: -112.45279

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	113	1	58	50	1	1	0	1	0	0	0	0	0	1	2.7%	0.9%
3/23/2016 12:15	102	1	56	34	1	0	2	0	0	4	1	3	0	0	2.9%	7.8%
3/23/2016 12:30	121	1	66	50	2	0	0	0	0	1	0	1	0	0	1.7%	1.7%
3/23/2016 12:45	121	1	62	53	0	1	0	0	1	3	0	0	0	0	0.8%	3.3%
3/23/2016 13:00	92	0	49	40	0	2	1	0	0	0	0	0	0	0	3.3%	0.0%
3/23/2016 13:15	80	0	49	28	2	0	0	0	0	1	0	0	0	0	2.5%	1.3%
3/23/2016 13:30	86	0	50	31	2	0	1	0	0	2	0	0	0	0	3.5%	2.3%
3/23/2016 13:45	117	1	65	42	5	1	0	0	3	0	0	0	0	0	5.1%	2.6%
3/23/2016 14:00	80	0	47	28	1	1	0	0	0	1	1	0	0	1	2.5%	3.8%
3/23/2016 14:15	104	1	55	43	1	2	0	0	0	2	0	0	0	0	2.9%	1.9%
3/23/2016 14:30	99	0	61	34	2	0	0	0	0	2	0	0	0	0	2.0%	2.0%
3/23/2016 14:45	83	1	57	24	0	0	0	0	1	0	0	0	0	0	0.0%	1.2%
3/23/2016 15:00	98	0	48	44	2	1	0	0	0	3	0	0	0	0	3.1%	3.1%
3/23/2016 15:15	117	1	63	49	2	0	1	0	0	1	0	0	0	0	2.6%	0.9%
3/23/2016 15:30	136	0	75	52	5	2	1	0	0	0	0	0	0	1	5.9%	0.7%
3/23/2016 15:45	117	3	56	53	2	0	0	0	2	0	0	1	0	0	1.7%	2.6%
3/23/2016 16:00	119	1	66	45	1	1	1	0	1	1	0	1	0	1	2.5%	3.4%
3/23/2016 16:15	116	0	62	46	1	3	0	0	0	4	0	0	0	0	3.4%	3.4%
3/23/2016 16:30	114	0	62	47	0	2	0	0	1	2	0	0	0	0	1.8%	2.6%
3/23/2016 16:45	120	0	78	38	0	1	0	0	0	3	0	0	0	0	0.8%	2.5%
3/23/2016 17:00	109	0	66	40	0	0	1	0	1	1	0	0	0	0	0.9%	1.8%
3/23/2016 17:15	96	0	52	43	0	0	0	0	0	1	0	0	0	0	0.0%	1.0%
3/23/2016 17:30	93	1	47	43	0	0	1	0	0	1	0	0	0	0	1.1%	1.1%
3/23/2016 17:45	76	1	42	31	0	0	1	0	0	1	0	0	0	0	1.3%	1.3%
3/23/2016 18:00	79	1	48	26	0	3	0	0	0	0	0	1	0	0	3.8%	1.3%
3/23/2016 18:15	58	0	32	25	0	0	0	0	0	0	0	1	0	0	0.0%	1.7%
3/23/2016 18:30	71	0	37	30	1	1	0	0	0	2	0	0	0	0	2.8%	2.8%
3/23/2016 18:45	66	0	36	29	0	0	0	0	1	0	0	0	0	0	0.0%	1.5%
3/23/2016 19:00	59	1	30	26	0	0	0	0	0	1	0	0	1	0	0.0%	3.4%
3/23/2016 19:15	53	0	36	14	0	0	1	0	0	1	0	0	0	1	1.9%	3.8%
3/23/2016 19:30	50	0	26	22	0	0	0	0	0	1	1	0	0	0	0.0%	4.0%
3/23/2016 19:45	74	0	45	28	0	0	0	0	0	1	0	0	0	0	0.0%	1.4%
3/23/2016 20:00	43	0	23	16	1	1	0	0	0	1	0	1	0	0	4.7%	4.7%
3/23/2016 20:15	36	0	24	11	0	0	0	0	0	1	0	0	0	0	0.0%	2.8%
3/23/2016 20:30	33	0	15	17	0	0	0	0	0	1	0	0	0	0	0.0%	3.0%
3/23/2016 20:45	23	0	12	11	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:00	32	0	21	11	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:15	29	0	19	9	0	0	0	0	0	1	0	0	0	0	0.0%	3.4%
3/23/2016 21:30	14	0	8	1	0	0	0	0	0	4	0	1	0	0	0.0%	35.7%
3/23/2016 21:45	11	0	9	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:00	9	0	6	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:15	10	0	7	2	0	0	0	0	0	1	0	0	0	0	0.0%	10.0%
3/23/2016 22:30	10	0	7	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:45	11	0	6	4	0	1	0	0	0	0	0	0	0	0	9.1%	0.0%
3/23/2016 23:00	10	0	6	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:15	8	0	5	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:30	5	0	4	0	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
3/23/2016 23:45	6	0	2	3	0	0	0	0	0	1	0	0	0	0	0.0%	16.7%
Day Totals	**6431**	**24**	**3515**	**2563**	**57**	**49**	**29**	**6**	**19**	**136**	**5**	**19**	**1**	**8**	**2.2%**	**2.9%**

AM Peak Hr	**6:30 AM**
AM Peak Vol	**563**
AM PHF	**0.896**
PM Peak Hr	**3:15 PM**
PM Peak Vol	**489**
PM PHF	**0.899**

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client:	Burgess & Niple, Inc.	Site Ref:	1
File Number:	1602330	Direction:	SB
Route:	AZ-89 (set 300' n/o 3N)	Latitude:	34.77844
Location:	N of E RD 3 N	Longitude:	-112.45279

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	6	0	0	0	0	0	0	0	1	1	2	1	1	0	0	0	0	0
3/23/2016 0:15	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
3/23/2016 0:30	8	0	0	0	0	0	0	1	2	1	3	1	0	0	0	0	0	0
3/23/2016 0:45	4	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0
3/23/2016 1:00	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
3/23/2016 1:15	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
3/23/2016 1:30	10	0	0	0	0	0	1	0	1	2	5	0	1	0	0	0	0	0
3/23/2016 1:45	5	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0
3/23/2016 2:00	9	0	0	0	0	0	0	0	2	2	3	1	1	0	0	0	0	0
3/23/2016 2:15	9	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	0
3/23/2016 2:30	8	0	0	0	0	0	0	0	2	4	0	2	0	0	0	0	0	0
3/23/2016 2:45	7	0	0	0	0	0	0	0	0	3	2	1	1	0	0	0	0	0
3/23/2016 3:00	5	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0
3/23/2016 3:15	12	0	0	0	0	0	0	2	1	4	3	2	0	0	0	0	0	0
3/23/2016 3:30	8	0	0	0	0	0	0	0	2	3	2	0	1	0	0	0	0	0
3/23/2016 3:45	6	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	0	0
3/23/2016 4:00	16	0	0	0	0	0	0	0	1	2	6	5	1	0	0	1	0	0
3/23/2016 4:15	22	0	0	0	0	0	0	0	5	6	5	3	3	0	0	0	0	0
3/23/2016 4:30	19	0	0	0	0	0	0	0	0	7	8	2	1	1	0	0	0	0
3/23/2016 4:45	16	0	0	0	0	0	0	0	3	4	4	2	2	0	1	0	0	0
3/23/2016 5:00	34	0	0	0	0	0	0	0	1	10	15	5	3	0	0	0	0	0
3/23/2016 5:15	36	0	0	0	0	0	0	3	7	9	6	8	2	0	1	0	0	0
3/23/2016 5:30	55	0	0	0	0	0	0	0	5	17	20	7	6	0	0	0	0	0
3/23/2016 5:45	75	0	0	0	0	0	0	0	11	20	28	13	3	0	0	0	0	0
3/23/2016 6:00	68	0	0	0	0	0	0	1	6	21	21	16	3	0	0	0	0	0
3/23/2016 6:15	102	0	0	0	0	0	0	2	16	17	46	20	1	0	0	0	0	0
3/23/2016 6:30	120	0	0	0	0	0	0	0	5	14	56	42	3	0	0	0	0	0
3/23/2016 6:45	129	0	0	0	0	0	0	0	12	40	60	16	1	0	0	0	0	0
3/23/2016 7:00	157	0	0	0	0	0	0	11	18	52	58	14	4	0	0	0	0	0
3/23/2016 7:15	157	0	0	0	0	0	4	4	10	40	74	24	1	0	0	0	0	0
3/23/2016 7:30	115	0	0	0	0	0	0	1	10	31	30	33	10	0	0	0	0	0
3/23/2016 7:45	132	0	0	0	0	0	0	0	10	44	50	22	4	2	0	0	0	0
3/23/2016 8:00	125	0	0	0	0	0	0	2	17	41	38	20	5	2	0	0	0	0
3/23/2016 8:15	130	0	0	0	0	0	7	14	17	38	27	20	7	0	0	0	0	0
3/23/2016 8:30	103	0	0	0	0	0	0	0	5	40	39	17	2	0	0	0	0	0
3/23/2016 8:45	108	0	0	0	0	0	0	2	14	39	31	17	5	0	0	0	0	0
3/23/2016 9:00	105	0	0	0	0	0	0	0	14	22	29	32	8	0	0	0	0	0
3/23/2016 9:15	122	0	0	0	0	0	0	3	38	35	36	6	4	0	0	0	0	0
3/23/2016 9:30	96	0	0	0	0	0	4	7	11	34	30	9	1	0	0	0	0	0
3/23/2016 9:45	119	0	0	0	0	0	0	2	13	38	45	18	3	0	0	0	0	0
3/23/2016 10:00	97	0	0	0	0	0	0	0	5	32	35	24	1	0	0	0	0	0
3/23/2016 10:15	99	0	0	0	0	0	0	6	20	32	27	13	1	0	0	0	0	0
3/23/2016 10:30	132	0	0	0	0	0	0	1	20	41	46	20	4	0	0	0	0	0
3/23/2016 10:45	96	0	0	0	0	0	0	1	5	32	37	17	3	1	0	0	0	0
3/23/2016 11:00	106	0	0	0	0	0	0	0	7	30	49	16	4	0	0	0	0	0
3/23/2016 11:15	131	0	0	0	0	0	3	13	41	43	22	8	1	0	0	0	0	0
3/23/2016 11:30	95	0	0	0	0	0	0	3	14	36	25	16	1	0	0	0	0	0
3/23/2016 11:45	103	0	0	0	0	0	0	3	18	43	29	8	1	1	0	0	0	0
3/23/2016 12:00	113	0	0	0	0	0	0	2	14	38	46	12	1	0	0	0	0	0
3/23/2016 12:15	102	0	0	0	0	0	12	7	17	35	25	3	2	1	0	0	0	0
3/23/2016 12:30	121	0	0	0	0	0	0	3	10	51	47	10	0	0	0	0	0	0
3/23/2016 12:45	121	0	0	0	0	0	0	3	19	43	41	11	4	0	0	0	0	0
3/23/2016 13:00	92	0	0	0	0	0	0	0	9	25	42	14	2	0	0	0	0	0
3/23/2016 13:15	80	0	0	0	0	0	0	0	6	33	24	15	1	1	0	0	0	0
3/23/2016 13:30	86	0	0	0	0	0	0	1	8	49	17	8	3	0	0	0	0	0
3/23/2016 13:45	117	0	0	0	0	0	0	3	17	48	32	16	1	0	0	0	0	0
3/23/2016 14:00	80	0	0	0	0	0	0	1	5	27	32	14	1	0	0	0	0	0
3/23/2016 14:15	104	0	0	0	0	0	0	3	6	27	42	21	4	1	0	0	0	0
3/23/2016 14:30	99	0	0	0	0	0	1	1	6	27	36	26	2	0	0	0	0	0
3/23/2016 14:45	83	0	0	0	0	0	0	0	14	20	33	10	4	2	0	0	0	0
3/23/2016 15:00	98	0	0	0	0	0	1	0	10	27	29	27	3	1	0	0	0	0
3/23/2016 15:15	117	0	0	0	0	0	0	0	2	45	43	23	4	0	0	0	0	0
3/23/2016 15:30	136	0	0	0	0	1	2	12	25	36	38	22	0	0	0	0	0	0
3/23/2016 15:45	117	0	0	0	0	0	0	0	24	29	42	17	5	0	0	0	0	0
3/23/2016 16:00	119	0	0	0	0	0	0	2	14	33	51	16	2	1	0	0	0	0
3/23/2016 16:15	116	0	0	0	0	0	0	3	15	36	42	19	1	0	0	0	0	0
3/23/2016 16:30	114	0	0	0	0	0	0	0	5	32	46	24	5	2	0	0	0	0
3/23/2016 16:45	120	0	0	0	0	0	0	0	16	43	36	18	6	1	0	0	0	0
3/23/2016 17:00	109	0	0	0	0	0	0	0	3	27	44	25	9	1	0	0	0	0
3/23/2016 17:15	96	0	0	0	0	0	0	1	7	18	37	29	3	1	0	0	0	0
3/23/2016 17:30	93	0	0	0	0	0	0	0	2	28	37	19	6	1	0	0	0	0
3/23/2016 17:45	76	0	0	0	0	0	0	0	3	4	29	27	12	1	0	0	0	0
3/23/2016 18:00	79	0	0	0	0	0	0	1	7	18	19	29	5	0	0	0	0	0
3/23/2016 18:15	58	0	0	0	0	0	0	0	2	3	37	14	2	0	0	0	0	0
3/23/2016 18:30	71	0	0	0	0	0	0	0	1	20	20	23	5	2	0	0	0	0
3/23/2016 18:45	66	0	0	0	0	0	0	0	6	14	22	20	3	1	0	0	0	0
3/23/2016 19:00	59	0	0	0	0	0	3	7	7	21	13	6	2	0	0	0	0	0
3/23/2016 19:15	53	0	0	0	0	0	0	4	5	26	11	6	1	0	0	0	0	0
3/23/2016 19:30	50	0	0	0	0	0	0	3	10	11	20	6	0	0	0	0	0	0
3/23/2016 19:45	74	0	0	0	0	0	0	4	20	24	17	9	0	0	0	0	0	0
3/23/2016 20:00	43	0	0	0	0	0	0	0	5	15	18	4	1	0	0	0	0	0
3/23/2016 20:15	36	0	0	0	0	0	0	0	13	13	8	2	0	0	0	0	0	0
3/23/2016 20:30	33	0	0	0	0	0	0	1	3	15	7	5	2	0	0	0	0	0
3/23/2016 20:45	23	0	0	0	0	0	0	0	1	6	9	6	1	0	0	0	0	0
3/23/2016 21:00	32	0	0	0	0	0	0	0	4	15	11	2	0	0	0	0	0	0

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client:	Burgess & Niple, Inc.	Site Ref:	1
File Number:	1602330	Direction:	SB
Route:	AZ-89 (set 300' n/o 3N)	Latitude:	34.77844
Location:	N of E RD 3 N	Longitude:	-112.45279

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	29	0	0	0	0	0	0	0	4	11	8	4	2	0	0	0	0	0
3/23/2016 21:30	14	0	0	0	0	0	0	2	6	3	3	0	0	0	0	0	0	0
3/23/2016 21:45	11	0	0	0	0	0	0	1	0	5	1	2	1	0	1	0	0	0
3/23/2016 22:00	9	0	0	0	0	0	0	1	3	1	3	0	1	0	0	0	0	0
3/23/2016 22:15	10	0	0	0	0	0	0	2	2	2	3	1	0	0	0	0	0	0
3/23/2016 22:30	10	0	0	0	0	0	0	0	0	2	5	2	1	0	0	0	0	0
3/23/2016 22:45	11	0	0	0	0	0	0	0	0	6	3	2	0	0	0	0	0	0
3/23/2016 23:00	10	0	0	0	0	0	0	1	0	3	1	2	3	0	0	0	0	0
3/23/2016 23:15	8	0	0	0	0	0	0	0	2	3	2	1	0	0	0	0	0	0
3/23/2016 23:30	5	0	0	0	0	0	0	0	0	3	1	1	0	0	0	0	0	0
3/23/2016 23:45	6	0	0	0	0	0	0	1	1	2	0	1	1	0	0	0	0	0
Day Totals	**6431**	**0**	**0**	**0**	**0**	**1**	**38**	**152**	**753**	**1967**	**2195**	**1077**	**220**	**24**	**3**	**1**	**0**	**0**

AM Peak Hr	**6:30 AM**	Average Speed	**45.6**	Pct > 25 mph	**100%**		
AM Peak Vol	**563**	Median Speed	**45.6**	Pct > 30 mph	**99%**		
AM PHF	**0.896**	85th Pct Speed	**51.5**	Pct > 35 mph	**97%**		
PM Peak Hr	**3:15 PM**	95th Pct Speed	**54.7**	Pct > 40 mph	**85%**		
PM Peak Vol	**489**	Pace Speed	**40**	Pct > 45 mph	**55%**		
PM PHF	**0.899**	Percent in Pace	**64.1%**	Pct > 50 mph	**21%**		
		Speed Limit	**35**				
		Percent Speedin	**97.0%**				

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602331
Route: AZ-89
Location: Btwn BALD EAGLE TRAIL & ROLLING HILLS RD

Site Ref: 2
Direction: NB
Latitude: 34.85875
Longitude: -112.46866

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	6	0	4	1	0	0	0	0	0	0	0	1	0	0	0.0%	16.7%
3/23/2016 0:15	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:30	9	0	4	1	0	0	0	0	0	4	0	0	0	0	0.0%	44.4%
3/23/2016 0:45	5	0	4	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:00	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:15	4	0	1	2	0	0	0	0	0	1	0	0	0	0	0.0%	25.0%
3/23/2016 1:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0%	100.0%
3/23/2016 1:45	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 2:00	5	0	0	3	0	0	0	0	0	1	0	0	0	1	0.0%	40.0%
3/23/2016 2:15	3	0	1	1	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 2:30	4	0	1	1	0	0	0	0	0	2	0	0	0	0	0.0%	50.0%
3/23/2016 2:45	8	0	2	2	0	0	0	0	0	3	0	1	0	0	0.0%	50.0%
3/23/2016 3:00	5	0	4	0	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
3/23/2016 3:15	3	0	1	0	0	0	0	0	0	2	0	0	0	0	0.0%	66.7%
3/23/2016 3:30	6	0	2	3	0	0	0	0	0	1	0	0	0	0	0.0%	16.7%
3/23/2016 3:45	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 4:00	7	0	4	1	0	0	0	0	0	1	0	1	0	0	0.0%	28.6%
3/23/2016 4:15	4	0	1	2	0	0	0	0	0	1	0	0	0	0	0.0%	25.0%
3/23/2016 4:30	8	0	4	2	0	1	0	0	0	1	0	0	0	0	12.5%	12.5%
3/23/2016 4:45	14	0	7	5	0	0	0	0	0	1	0	1	0	0	0.0%	14.3%
3/23/2016 5:00	15	0	8	4	0	0	0	0	1	1	0	1	0	0	0.0%	20.0%
3/23/2016 5:15	19	1	8	9	0	0	0	0	1	0	0	0	0	0	0.0%	5.3%
3/23/2016 5:30	24	0	7	15	0	0	0	1	0	1	0	0	0	0	4.2%	4.2%
3/23/2016 5:45	16	0	6	8	0	0	0	0	0	2	0	0	0	0	0.0%	12.5%
3/23/2016 6:00	32	0	17	12	0	0	0	0	0	3	0	0	0	0	0.0%	9.4%
3/23/2016 6:15	44	0	21	18	1	0	0	0	0	4	0	0	0	0	2.3%	9.1%
3/23/2016 6:30	41	1	16	19	1	0	2	0	0	2	0	0	0	0	7.3%	4.9%
3/23/2016 6:45	43	0	22	14	2	0	0	0	0	4	0	0	1	0	4.7%	11.6%
3/23/2016 7:00	39	0	21	10	0	2	0	0	1	5	0	0	0	0	5.1%	15.4%
3/23/2016 7:15	56	0	32	17	3	0	0	0	0	0	4	0	0	0	5.4%	7.1%
3/23/2016 7:30	66	0	43	17	1	1	0	0	0	1	3	0	0	0	3.0%	6.1%
3/23/2016 7:45	38	0	22	14	0	0	0	0	0	2	0	0	0	0	0.0%	5.3%
3/23/2016 8:00	50	0	29	15	0	0	1	0	3	2	0	0	0	0	2.0%	10.0%
3/23/2016 8:15	49	0	25	14	0	1	0	1	0	3	4	1	0	0	4.1%	16.3%
3/23/2016 8:30	30	0	14	12	0	0	0	0	0	3	1	0	0	0	0.0%	13.3%
3/23/2016 8:45	57	0	43	12	0	0	1	0	0	1	0	0	0	0	1.8%	1.8%
3/23/2016 9:00	66	0	42	20	0	4	0	0	0	0	0	0	0	0	6.1%	0.0%
3/23/2016 9:15	51	0	28	11	0	0	2	0	0	5	5	0	0	0	3.9%	19.6%
3/23/2016 9:30	52	0	24	20	0	1	1	0	2	3	1	0	0	0	3.8%	11.5%
3/23/2016 9:45	62	0	39	19	0	0	1	0	1	2	0	0	0	0	1.6%	4.8%
3/23/2016 10:00	58	0	31	19	1	1	0	0	1	5	0	0	0	0	3.4%	10.3%
3/23/2016 10:15	70	0	38	22	1	0	0	0	1	1	6	0	0	1	1.4%	12.9%
3/23/2016 10:30	63	0	34	27	1	0	0	0	1	0	0	0	0	0	1.6%	1.6%
3/23/2016 10:45	54	0	34	18	0	1	0	0	0	1	0	0	0	0	1.9%	1.9%
3/23/2016 11:00	71	1	37	23	2	2	0	0	0	4	1	1	0	0	5.6%	8.5%
3/23/2016 11:15	79	2	43	22	1	1	1	0	2	2	5	0	0	0	3.8%	11.4%
3/23/2016 11:30	70	0	37	29	0	0	0	0	0	3	1	0	0	0	0.0%	5.7%
3/23/2016 11:45	59	2	46	10	0	0	0	0	0	1	0	0	0	0	0.0%	1.7%

Traffic Research & Analysis, Inc.
3844 East Indian School Road
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(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602331
Route: AZ-89
Location: Btwn BALD EAGLE TRAIL & ROLLING HILLS RD

Site Ref: 2
Direction: NB
Latitude: 34.85875
Longitude: -112.46866

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	74	1	46	25	0	0	0	0	0	1	1	0	0	0	0.0%	2.7%
3/23/2016 12:15	68	0	44	14	0	0	0	1	0	4	4	0	1	0	1.5%	13.2%
3/23/2016 12:30	55	0	34	19	0	0	1	0	0	0	1	0	0	0	1.8%	1.8%
3/23/2016 12:45	72	1	49	19	1	0	1	0	0	0	0	0	0	1	2.8%	1.4%
3/23/2016 13:00	87	1	53	27	0	1	0	0	0	3	2	0	0	0	1.1%	5.7%
3/23/2016 13:15	89	0	48	28	4	1	1	0	0	3	3	0	1	0	6.7%	7.9%
3/23/2016 13:30	74	1	47	20	4	0	0	0	0	2	0	0	0	0	5.4%	2.7%
3/23/2016 13:45	76	1	46	24	0	1	2	0	0	1	1	0	0	0	3.9%	2.6%
3/23/2016 14:00	74	1	51	17	2	0	0	0	0	3	0	0	0	0	2.7%	4.1%
3/23/2016 14:15	84	0	56	19	0	0	1	0	0	3	4	0	0	1	1.2%	9.5%
3/23/2016 14:30	92	0	62	25	0	2	0	0	1	1	1	0	0	0	2.2%	3.3%
3/23/2016 14:45	100	0	61	35	1	0	0	0	1	2	0	0	0	0	1.0%	3.0%
3/23/2016 15:00	74	0	47	26	0	0	0	0	0	1	0	0	0	0	0.0%	1.4%
3/23/2016 15:15	94	0	59	23	5	0	0	1	1	4	1	0	0	0	6.4%	6.4%
3/23/2016 15:30	98	1	58	38	0	0	0	0	0	1	0	0	0	0	0.0%	1.0%
3/23/2016 15:45	88	0	63	22	1	0	0	0	0	2	0	0	0	0	1.1%	2.3%
3/23/2016 16:00	125	0	82	39	2	0	0	0	0	2	0	0	0	0	1.6%	1.6%
3/23/2016 16:15	98	0	61	35	0	0	0	0	0	2	0	0	0	0	0.0%	2.0%
3/23/2016 16:30	118	0	73	41	1	0	0	0	2	0	0	1	0	0	0.8%	2.5%
3/23/2016 16:45	105	0	71	31	0	0	0	0	0	2	0	1	0	0	0.0%	2.9%
3/23/2016 17:00	127	0	83	43	0	0	0	0	0	1	0	0	0	0	0.0%	0.8%
3/23/2016 17:15	116	0	65	46	1	1	0	0	0	3	0	0	0	0	1.7%	2.6%
3/23/2016 17:30	109	0	66	38	0	2	1	0	1	1	0	0	0	0	2.8%	1.8%
3/23/2016 17:45	112	0	74	37	0	0	0	0	0	1	0	0	0	0	0.0%	0.9%
3/23/2016 18:00	84	0	60	23	0	0	0	0	0	1	0	0	0	0	0.0%	1.2%
3/23/2016 18:15	83	0	53	29	0	0	0	0	0	1	0	0	0	0	0.0%	1.2%
3/23/2016 18:30	84	0	49	33	0	0	1	0	0	0	0	0	0	1	1.2%	1.2%
3/23/2016 18:45	72	0	45	26	1	0	0	0	0	0	0	0	0	0	1.4%	0.0%
3/23/2016 19:00	47	0	31	15	0	0	0	0	0	1	0	0	0	0	0.0%	2.1%
3/23/2016 19:15	53	0	37	16	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 19:30	47	0	33	12	0	1	0	0	0	1	0	0	0	0	2.1%	2.1%
3/23/2016 19:45	56	0	38	18	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:00	52	0	36	14	0	0	0	0	0	2	0	0	0	0	0.0%	3.8%
3/23/2016 20:15	44	0	31	13	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:30	34	0	19	13	0	0	0	0	0	2	0	0	0	0	0.0%	5.9%
3/23/2016 20:45	41	0	31	8	0	0	0	0	0	2	0	0	0	0	0.0%	4.9%
3/23/2016 21:00	37	0	29	8	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:15	40	0	32	7	0	0	0	0	0	1	0	0	0	0	0.0%	2.5%
3/23/2016 21:30	35	0	25	9	0	0	0	0	0	1	0	0	0	0	0.0%	2.9%
3/23/2016 21:45	26	0	20	5	0	0	0	0	0	1	0	0	0	0	0.0%	3.8%
3/23/2016 22:00	14	0	6	8	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:15	25	0	12	12	0	0	0	0	0	1	0	0	0	0	0.0%	4.0%
3/23/2016 22:30	18	0	16	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:45	13	0	9	3	0	0	0	0	0	1	0	0	0	0	0.0%	7.7%
3/23/2016 23:00	11	0	9	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:15	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:30	13	0	9	3	0	0	0	0	0	1	0	0	0	0	0.0%	7.7%
3/23/2016 23:45	10	0	6	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
Day Totals	**4631**	**14**	**2857**	**1451**	**37**	**24**	**17**	**4**	**20**	**141**	**49**	**9**	**3**	**5**	**1.8%**	**4.9%**

AM Peak Hr	**11:15 AM**
AM Peak Vol	**282**
AM PHF	**0.892**
PM Peak Hr	**4:30 PM**
PM Peak Vol	**466**
PM PHF	**0.917**

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Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	6	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0
3/23/2016 0:15	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
3/23/2016 0:30	9	0	0	0	0	0	0	0	0	0	0	0	1	4	4	0	0	0
3/23/2016 0:45	5	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0
3/23/2016 1:00	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
3/23/2016 1:15	4	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
3/23/2016 1:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
3/23/2016 1:45	3	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0
3/23/2016 2:00	5	0	0	0	0	0	0	0	0	0	0	0	1	1	2	1	0	0
3/23/2016 2:15	3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0
3/23/2016 2:30	4	0	0	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0
3/23/2016 2:45	8	0	0	0	0	0	0	0	0	0	1	0	0	4	3	0	0	0
3/23/2016 3:00	5	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0
3/23/2016 3:15	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
3/23/2016 3:30	6	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0
3/23/2016 3:45	3	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0
3/23/2016 4:00	7	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0
3/23/2016 4:15	4	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0
3/23/2016 4:30	8	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	0	0
3/23/2016 4:45	14	0	0	0	0	0	0	0	0	0	0	0	0	3	7	3	1	0
3/23/2016 5:00	15	0	0	0	0	0	0	0	0	0	0	0	1	9	3	1	1	0
3/23/2016 5:15	19	0	0	0	0	0	0	0	0	0	0	0	0	5	14	0	0	0
3/23/2016 5:30	24	0	0	0	0	0	0	0	0	0	0	0	5	8	9	2	0	0
3/23/2016 5:45	16	0	0	0	0	0	0	0	0	0	0	0	3	7	5	1	0	0
3/23/2016 6:00	32	0	0	0	0	0	0	0	0	0	0	2	3	15	11	1	0	0
3/23/2016 6:15	44	0	0	0	0	0	0	0	4	4	1	0	3	18	13	1	0	0
3/23/2016 6:30	41	0	0	0	0	0	0	0	0	0	0	1	6	20	12	1	0	1
3/23/2016 6:45	43	0	0	0	0	0	0	0	0	0	0	3	9	19	11	1	0	0
3/23/2016 7:00	39	0	0	0	0	0	0	0	0	0	1	1	11	8	16	2	0	0
3/23/2016 7:15	56	0	0	0	0	0	0	0	0	0	0	4	8	28	11	5	0	0
3/23/2016 7:30	66	0	0	0	0	0	0	0	0	0	1	1	7	34	14	9	0	0
3/23/2016 7:45	38	0	0	0	0	0	0	0	0	0	0	0	2	17	16	2	1	0
3/23/2016 8:00	50	0	0	0	0	0	0	0	0	0	0	0	7	15	23	5	0	0
3/23/2016 8:15	49	0	0	0	0	0	0	0	0	0	0	2	7	28	10	2	0	0
3/23/2016 8:30	30	0	0	0	0	0	0	0	0	0	3	4	10	7	5	1	0	0
3/23/2016 8:45	57	0	0	0	0	0	0	0	0	0	2	1	7	32	13	2	0	0
3/23/2016 9:00	66	0	0	0	0	0	0	0	0	0	2	12	17	21	11	3	0	0
3/23/2016 9:15	51	0	0	0	0	0	0	0	0	0	1	2	12	19	16	1	0	0
3/23/2016 9:30	52	0	0	0	0	0	0	0	0	0	2	5	8	22	11	4	0	0
3/23/2016 9:45	62	0	0	0	0	0	0	0	0	0	0	7	20	25	9	1	0	0
3/23/2016 10:00	58	0	0	0	0	0	0	0	1	4	1	9	13	20	9	1	0	0
3/23/2016 10:15	70	0	0	0	0	0	0	0	0	0	2	8	12	34	13	1	0	0
3/23/2016 10:30	63	0	0	0	0	0	0	0	0	0	2	6	15	25	13	2	0	0
3/23/2016 10:45	54	0	0	0	0	0	0	0	0	0	1	1	8	33	10	0	1	0
3/23/2016 11:00	71	0	0	0	0	0	0	0	0	1	3	20	16	17	9	4	1	0
3/23/2016 11:15	79	0	0	0	0	0	0	0	0	3	7	4	20	38	5	2	0	0
3/23/2016 11:30	70	0	0	0	0	0	0	0	0	0	0	6	25	29	10	0	0	0
3/23/2016 11:45	59	0	0	0	0	0	0	0	0	0	0	1	4	36	17	1	0	0
3/23/2016 12:00	74	0	0	0	0	0	0	0	0	0	0	6	12	29	22	5	0	0
3/23/2016 12:15	68	0	0	0	0	0	0	0	0	0	1	12	22	16	15	2	0	0
3/23/2016 12:30	55	0	0	0	0	0	0	0	0	0	0	1	15	26	10	2	0	1
3/23/2016 12:45	72	0	0	0	0	0	0	0	0	0	1	3	15	30	20	2	1	0
3/23/2016 13:00	87	0	0	0	0	0	0	0	0	0	2	11	8	33	30	2	1	0
3/23/2016 13:15	89	0	0	0	0	0	0	0	0	0	2	5	20	46	14	2	0	0
3/23/2016 13:30	74	0	0	0	0	0	0	0	0	3	6	9	19	24	9	4	0	0
3/23/2016 13:45	76	0	0	0	0	0	0	0	0	0	1	1	14	39	18	3	0	0
3/23/2016 14:00	74	0	0	0	0	0	0	0	0	0	0	1	19	41	12	1	0	0
3/23/2016 14:15	84	0	0	0	0	0	0	0	0	0	0	1	21	46	10	6	0	0
3/23/2016 14:30	92	0	0	0	0	0	0	0	0	1	0	8	18	43	19	3	0	0
3/23/2016 14:45	100	0	0	0	0	0	0	0	0	0	4	2	18	51	23	2	0	0
3/23/2016 15:00	74	0	0	0	0	0	0	0	0	0	0	6	9	35	22	1	1	0
3/23/2016 15:15	94	0	0	0	0	0	0	0	0	0	3	8	19	38	22	4	0	0
3/23/2016 15:30	98	0	0	0	0	0	0	0	0	0	2	7	16	52	21	0	0	0
3/23/2016 15:45	88	0	0	0	0	0	0	0	0	0	0	2	13	36	33	4	0	0
3/23/2016 16:00	125	0	0	0	0	0	0	0	0	0	0	3	42	58	17	5	0	0
3/23/2016 16:15	98	0	0	0	0	0	0	0	0	0	0	5	17	48	20	8	0	0
3/23/2016 16:30	118	0	0	0	0	0	0	0	0	0	0	0	15	74	26	3	0	0
3/23/2016 16:45	105	0	0	0	0	0	0	0	0	0	1	0	16	46	39	3	0	0
3/23/2016 17:00	127	0	0	0	0	0	0	0	0	0	1	15	28	49	33	1	0	0
3/23/2016 17:15	116	0	0	0	0	0	0	0	0	0	4	14	12	42	39	5	0	0
3/23/2016 17:30	109	0	0	0	0	0	0	0	0	0	0	1	17	43	42	6	0	0
3/23/2016 17:45	112	0	0	0	0	0	0	0	0	0	1	4	19	50	32	6	0	0
3/23/2016 18:00	84	0	0	0	0	0	0	0	0	0	0	1	10	28	42	2	1	0
3/23/2016 18:15	83	0	0	0	0	0	0	0	0	0	0	2	8	32	36	3	0	2
3/23/2016 18:30	84	0	0	0	0	0	0	0	0	0	0	0	12	33	33	5	1	0
3/23/2016 18:45	72	0	0	0	0	0	0	0	0	0	0	5	16	34	16	0	1	0
3/23/2016 19:00	47	0	0	0	0	0	0	0	0	0	0	3	14	21	9	0	0	0
3/23/2016 19:15	53	0	0	0	0	0	0	0	0	1	1	4	12	25	10	0	0	0
3/23/2016 19:30	47	0	0	0	0	0	0	0	1	3	3	6	5	19	7	3	0	0
3/23/2016 19:45	56	0	0	0	0	0	0	0	0	0	1	3	10	23	12	5	2	0
3/23/2016 20:00	52	0	0	0	0	0	0	0	0	0	0	4	6	24	15	3	0	0
3/23/2016 20:15	44	0	0	0	0	0	0	0	0	1	0	4	9	22	6	2	0	0
3/23/2016 20:30	34	0	0	0	0	0	0	0	0	1	6	2	3	13	8	1	0	0
3/23/2016 20:45	41	0	0	0	0	0	0	0	0	0	4	4	6	18	8	1	0	0
3/23/2016 21:00	37	0	0	0	0	0	0	0	0	0	0	0	5	14	13	5	0	0

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Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	40	0	0	0	0	0	0	0	0	0	0	4	9	17	9	1	0	0
3/23/2016 21:30	35	0	0	0	0	0	0	0	0	0	1	0	8	16	7	3	0	0
3/23/2016 21:45	26	0	0	0	0	0	0	0	0	0	0	3	3	15	5	0	0	0
3/23/2016 22:00	14	0	0	0	0	0	0	0	0	0	1	1	3	5	3	1	0	0
3/23/2016 22:15	25	0	0	0	0	0	0	0	0	0	0	5	6	6	8	0	0	0
3/23/2016 22:30	18	0	0	0	0	0	0	0	0	0	0	4	2	4	7	1	0	0
3/23/2016 22:45	13	0	0	0	0	0	0	0	0	0	1	0	4	1	6	1	0	0
3/23/2016 23:00	11	0	0	0	0	0	0	0	0	0	0	0	0	4	5	0	1	1
3/23/2016 23:15	6	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	1	0
3/23/2016 23:30	13	0	0	0	0	0	0	0	0	0	0	0	1	5	6	1	0	0
3/23/2016 23:45	10	0	0	0	0	0	0	0	0	0	0	0	1	2	6	1	0	0
Day Totals	**4631**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**22**	**78**	**281**	**845**	**2002**	**1192**	**185**	**15**	**5**

AM Peak Hr	**11:15 AM**	Average Speed	**62.4**	Pct > 25 mph	**100%**		
AM Peak Vol	**282**	Median Speed	**62.7**	Pct > 30 mph	**100%**		
AM PHF	**0.892**	85th Pct Speed	**67.9**	Pct > 35 mph	**100%**		
PM Peak Hr	**4:30 PM**	95th Pct Speed	**69.8**	Pct > 40 mph	**100%**		
PM Peak Vol	**466**	Pace Speed	**60**	Pct > 45 mph	**99%**		
PM PHF	**0.917**	Percent in Pace	**68.7%**	Pct > 50 mph	**98%**		
		Speed Limit	**65**				
		Percent Speedin	**30.2%**				

Traffic Research & Analysis, Inc.
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Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602332
Route: AZ-89
Location: Btwn BALD EAGLE TRAIL & ROLLING HILLS RD

Site Ref: 2
Direction: SB
Latitude: 34.85875
Longitude: -112.46866

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:15	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:30	5	0	3	1	1	0	0	0	0	0	0	0	0	0	20.0%	0.0%
3/23/2016 0:45	4	0	2	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:00	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0.0%	50.0%
3/23/2016 1:15	5	0	3	0	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 1:30	3	0	1	1	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 1:45	4	0	1	1	0	0	0	0	0	2	0	0	0	0	0.0%	50.0%
3/23/2016 2:00	7	0	5	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 2:15	8	0	5	2	0	0	0	0	0	1	0	0	0	0	0.0%	12.5%
3/23/2016 2:30	7	0	2	3	0	0	0	0	0	2	0	0	0	0	0.0%	28.6%
3/23/2016 2:45	6	0	1	2	0	0	1	0	0	2	0	0	0	0	16.7%	33.3%
3/23/2016 3:00	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 3:15	12	0	9	1	0	0	0	0	0	2	0	0	0	0	0.0%	16.7%
3/23/2016 3:30	5	0	3	0	0	0	0	0	0	2	0	0	0	0	0.0%	40.0%
3/23/2016 3:45	9	0	5	3	0	0	0	0	0	1	0	0	0	0	0.0%	11.1%
3/23/2016 4:00	16	0	8	5	0	0	0	0	0	2	0	1	0	0	0.0%	18.8%
3/23/2016 4:15	15	0	10	2	0	0	0	0	0	2	0	1	0	0	0.0%	20.0%
3/23/2016 4:30	13	0	5	5	0	0	0	0	0	3	0	0	0	0	0.0%	23.1%
3/23/2016 4:45	11	0	5	5	0	0	0	0	0	1	0	0	0	0	0.0%	9.1%
3/23/2016 5:00	25	0	14	10	0	0	0	0	0	0	0	1	0	0	0.0%	4.0%
3/23/2016 5:15	33	0	16	12	1	0	0	0	0	4	0	0	0	0	3.0%	12.1%
3/23/2016 5:30	57	0	29	27	0	0	0	0	0	1	0	0	0	0	0.0%	1.8%
3/23/2016 5:45	51	0	25	22	0	1	0	0	1	1	0	1	0	0	2.0%	5.9%
3/23/2016 6:00	62	0	32	27	0	1	1	0	0	1	0	0	0	0	3.2%	1.6%
3/23/2016 6:15	91	0	61	30	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 6:30	100	0	44	53	0	0	0	0	0	2	0	1	0	0	0.0%	3.0%
3/23/2016 6:45	117	0	73	42	1	0	0	0	0	1	0	0	0	0	0.9%	0.9%
3/23/2016 7:00	127	0	64	54	5	1	0	0	0	2	0	1	0	0	4.7%	2.4%
3/23/2016 7:15	115	1	65	47	0	1	0	0	0	1	0	0	0	0	0.9%	0.9%
3/23/2016 7:30	86	0	52	31	2	0	0	0	0	1	0	0	0	0	2.3%	1.2%
3/23/2016 7:45	102	0	49	44	2	1	0	0	0	5	1	0	0	0	2.9%	5.9%
3/23/2016 8:00	91	0	51	33	5	1	0	0	0	1	0	0	0	0	6.6%	1.1%
3/23/2016 8:15	77	0	40	32	1	1	1	0	0	2	0	0	0	0	3.9%	2.6%
3/23/2016 8:30	80	1	46	28	1	0	0	0	0	4	0	0	0	0	1.3%	5.0%
3/23/2016 8:45	67	0	35	27	1	0	1	0	0	2	1	0	0	0	3.0%	4.5%
3/23/2016 9:00	84	1	55	21	1	0	1	0	1	3	1	0	0	0	2.4%	6.0%
3/23/2016 9:15	80	0	49	29	0	0	0	0	0	2	0	0	0	0	0.0%	2.5%
3/23/2016 9:30	65	0	30	33	0	0	0	0	1	1	0	0	0	0	0.0%	3.1%
3/23/2016 9:45	75	0	40	27	5	0	1	0	0	2	0	0	0	0	8.0%	2.7%
3/23/2016 10:00	81	0	44	28	1	0	3	0	2	3	0	0	0	0	4.9%	6.2%
3/23/2016 10:15	87	0	50	32	0	1	1	0	0	2	1	0	0	0	2.3%	3.4%
3/23/2016 10:30	80	0	46	29	1	0	2	0	0	2	0	0	0	0	3.8%	2.5%
3/23/2016 10:45	75	0	39	27	2	0	2	1	2	2	0	0	0	0	6.7%	5.3%
3/23/2016 11:00	75	0	36	31	2	2	3	0	0	1	0	0	0	0	9.3%	1.3%
3/23/2016 11:15	70	0	38	27	1	1	0	0	0	2	1	0	0	0	2.9%	4.3%
3/23/2016 11:30	73	0	31	34	3	1	2	0	0	2	0	0	0	0	8.2%	2.7%
3/23/2016 11:45	77	0	38	30	4	1	1	1	0	1	1	0	0	0	9.1%	2.6%

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Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	80	0	49	25	1	2	1	0	0	0	1	1	0	0	5.0%	2.5%
3/23/2016 12:15	67	2	39	19	1	0	2	0	0	4	0	0	0	0	4.5%	6.0%
3/23/2016 12:30	70	0	39	28	1	1	0	0	0	1	0	0	0	0	2.9%	1.4%
3/23/2016 12:45	82	0	41	35	1	0	2	1	0	1	1	0	0	0	4.9%	2.4%
3/23/2016 13:00	80	0	45	27	4	0	4	0	0	0	0	0	0	0	10.0%	0.0%
3/23/2016 13:15	61	0	38	20	2	0	0	0	0	1	0	0	0	0	3.3%	1.6%
3/23/2016 13:30	51	0	24	18	4	1	2	0	1	1	0	0	0	0	13.7%	3.9%
3/23/2016 13:45	66	0	36	18	8	1	1	0	1	1	0	0	0	0	15.2%	3.0%
3/23/2016 14:00	64	0	39	20	2	0	0	0	0	3	0	0	0	0	3.1%	4.7%
3/23/2016 14:15	77	2	39	27	4	1	1	0	0	3	0	0	0	0	7.8%	3.9%
3/23/2016 14:30	62	0	38	20	0	0	2	0	0	2	0	0	0	0	3.2%	3.2%
3/23/2016 14:45	55	1	30	22	0	0	1	0	1	0	0	0	0	0	1.8%	1.8%
3/23/2016 15:00	75	0	37	26	4	0	4	0	1	3	0	0	0	0	10.7%	5.3%
3/23/2016 15:15	90	0	47	35	1	0	3	1	1	2	0	0	0	0	5.6%	3.3%
3/23/2016 15:30	83	0	51	25	5	0	1	0	1	0	0	0	0	0	7.2%	1.2%
3/23/2016 15:45	80	2	45	30	0	1	1	0	1	0	0	0	0	0	2.5%	1.3%
3/23/2016 16:00	73	0	44	24	1	0	1	0	0	2	0	0	0	1	2.7%	4.1%
3/23/2016 16:15	77	0	44	28	0	2	0	0	0	3	0	0	0	0	2.6%	3.9%
3/23/2016 16:30	81	1	44	30	2	1	0	0	0	3	0	0	0	0	3.7%	3.7%
3/23/2016 16:45	83	0	45	35	1	0	1	0	0	1	0	0	0	0	2.4%	1.2%
3/23/2016 17:00	66	0	39	24	1	0	0	0	0	1	0	1	0	0	1.5%	3.0%
3/23/2016 17:15	56	0	36	16	1	0	1	0	0	2	0	0	0	0	3.6%	3.6%
3/23/2016 17:30	75	0	43	27	1	1	1	0	0	1	1	0	0	0	4.0%	2.7%
3/23/2016 17:45	42	0	20	21	0	0	0	0	0	0	1	0	0	0	0.0%	2.4%
3/23/2016 18:00	52	1	29	19	0	1	0	0	0	0	0	2	0	0	1.9%	3.8%
3/23/2016 18:15	42	0	25	16	0	0	0	0	0	1	0	0	0	0	0.0%	2.4%
3/23/2016 18:30	44	0	29	13	0	0	0	0	0	2	0	0	0	0	0.0%	4.5%
3/23/2016 18:45	48	0	26	19	0	2	0	0	0	1	0	0	0	0	4.2%	2.1%
3/23/2016 19:00	27	0	13	13	1	0	0	0	0	0	0	0	0	0	3.7%	0.0%
3/23/2016 19:15	43	0	27	12	0	0	1	0	0	2	1	0	0	0	2.3%	7.0%
3/23/2016 19:30	38	0	17	20	0	0	0	0	0	1	0	0	0	0	0.0%	2.6%
3/23/2016 19:45	28	0	14	11	0	1	0	0	0	2	0	0	0	0	3.6%	7.1%
3/23/2016 20:00	17	0	10	6	0	0	0	0	0	0	0	1	0	0	0.0%	5.9%
3/23/2016 20:15	16	0	7	7	0	0	0	0	0	2	0	0	0	0	0.0%	12.5%
3/23/2016 20:30	16	0	10	6	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:45	24	0	15	9	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:00	15	0	9	6	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:15	14	0	7	3	0	0	0	0	0	4	0	0	0	0	0.0%	28.6%
3/23/2016 21:30	16	0	10	3	0	0	0	0	0	2	0	1	0	0	0.0%	18.8%
3/23/2016 21:45	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:00	6	0	5	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:15	6	0	5	0	0	0	0	0	0	1	0	0	0	0	0.0%	16.7%
3/23/2016 22:30	11	0	7	3	0	1	0	0	0	0	0	0	0	0	9.1%	0.0%
3/23/2016 22:45	12	0	7	5	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:00	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:15	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0%	100.0%
3/23/2016 23:45	5	0	1	3	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
Day Totals	**4531**	**12**	**2499**	**1683**	**86**	**29**	**50**	**4**	**14**	**129**	**12**	**12**	**0**	**1**	**3.7%**	**3.7%**

AM Peak Hr	**6:30 AM**
AM Peak Vol	**459**
AM PHF	**0.904**
PM Peak Hr	**3:00 PM**
PM Peak Vol	**328**
PM PHF	**0.911**

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Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
3/23/2016 0:15	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0
3/23/2016 0:30	5	0	0	0	0	0	0	0	0	0	0	0	1	2	1	1	0	0
3/23/2016 0:45	4	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0
3/23/2016 1:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3/23/2016 1:15	5	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0
3/23/2016 1:30	3	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0
3/23/2016 1:45	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
3/23/2016 2:00	7	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	1	0
3/23/2016 2:15	8	0	0	0	0	0	0	0	1	0	1	0	0	2	1	3	0	0
3/23/2016 2:30	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	0
3/23/2016 2:45	6	0	0	0	0	0	0	0	0	0	1	0	0	1	2	1	0	1
3/23/2016 3:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
3/23/2016 3:15	12	0	0	0	0	0	0	0	0	0	1	0	0	3	4	4	0	0
3/23/2016 3:30	5	0	0	0	0	0	0	0	0	1	0	0	0	0	2	1	1	0
3/23/2016 3:45	9	0	0	0	0	0	0	0	0	0	0	0	0	2	4	2	1	0
3/23/2016 4:00	16	0	0	0	0	0	0	0	0	0	0	1	2	1	9	3	0	0
3/23/2016 4:15	15	0	0	0	0	0	0	0	0	0	0	0	0	1	3	8	0	3
3/23/2016 4:30	13	0	0	0	0	0	0	0	0	0	1	1	2	3	2	2	1	1
3/23/2016 4:45	11	0	0	0	0	0	0	0	0	0	1	0	2	2	2	2	1	1
3/23/2016 5:00	25	0	0	0	0	0	0	0	0	0	0	0	1	4	13	3	3	1
3/23/2016 5:15	33	0	0	0	0	0	0	0	0	0	0	2	3	5	10	8	5	0
3/23/2016 5:30	57	0	0	0	0	0	0	0	0	2	1	1	3	16	19	11	2	2
3/23/2016 5:45	51	0	0	0	0	0	0	0	0	0	1	4	1	7	25	8	5	0
3/23/2016 6:00	62	0	0	0	0	0	0	0	0	0	0	0	5	15	21	15	5	1
3/23/2016 6:15	91	0	0	0	0	0	0	0	0	0	2	1	1	14	40	28	5	0
3/23/2016 6:30	100	0	0	0	0	0	0	0	0	0	3	6	3	26	33	18	7	4
3/23/2016 6:45	117	0	0	0	0	0	0	0	1	1	4	8	15	27	40	17	4	0
3/23/2016 7:00	127	0	0	0	0	0	0	0	0	1	2	3	6	42	44	23	5	1
3/23/2016 7:15	115	0	0	0	0	0	0	0	0	0	6	2	14	30	37	22	4	0
3/23/2016 7:30	86	0	0	0	0	0	0	0	0	0	1	4	5	16	35	15	7	3
3/23/2016 7:45	102	0	0	0	0	0	0	0	0	1	4	8	4	20	35	23	6	1
3/23/2016 8:00	91	0	0	0	0	0	0	0	1	0	2	12	6	18	28	20	4	0
3/23/2016 8:15	77	0	0	0	0	0	0	0	0	1	1	3	3	16	27	21	3	2
3/23/2016 8:30	80	0	0	0	0	0	0	0	0	1	4	6	1	16	35	15	2	0
3/23/2016 8:45	67	0	0	0	0	0	0	1	0	3	1	2	4	14	29	10	3	0
3/23/2016 9:00	84	0	0	0	0	0	0	0	0	1	2	4	5	22	36	10	4	0
3/23/2016 9:15	80	0	0	0	0	0	0	0	0	0	3	4	5	30	26	11	1	0
3/23/2016 9:30	65	0	0	0	0	0	0	0	0	2	1	0	9	20	29	4	0	0
3/23/2016 9:45	75	0	0	0	0	0	0	0	0	2	3	4	11	24	20	9	1	1
3/23/2016 10:00	81	0	0	0	0	0	0	0	0	0	2	3	6	28	29	12	1	0
3/23/2016 10:15	87	0	0	0	0	0	0	0	0	1	5	2	9	17	40	12	1	0
3/23/2016 10:30	80	0	0	0	0	0	0	0	0	0	6	4	6	25	27	5	5	2
3/23/2016 10:45	75	0	0	0	0	0	0	0	0	2	1	4	10	14	25	18	0	1
3/23/2016 11:00	75	0	0	0	0	0	0	0	0	0	2	3	6	13	32	18	1	0
3/23/2016 11:15	70	0	0	0	0	0	0	0	0	0	0	3	10	27	20	9	0	1
3/23/2016 11:30	73	0	0	0	0	0	0	0	0	2	5	3	13	18	22	8	2	0
3/23/2016 11:45	77	0	0	0	0	0	0	0	0	1	2	3	12	21	30	6	1	1
3/23/2016 12:00	80	0	0	0	0	0	0	0	0	1	4	2	9	31	24	7	1	1
3/23/2016 12:15	67	0	0	0	0	0	0	0	0	0	1	3	8	22	21	10	2	0
3/23/2016 12:30	70	0	0	0	0	0	0	0	0	0	2	1	2	28	26	9	1	1
3/23/2016 12:45	82	0	0	0	0	0	0	1	0	0	3	4	5	23	33	12	1	0
3/23/2016 13:00	80	0	0	0	0	0	0	0	0	0	3	1	11	24	28	9	4	0
3/23/2016 13:15	61	0	0	0	0	0	0	0	0	1	3	1	8	18	20	8	2	0
3/23/2016 13:30	51	0	0	0	0	0	0	0	0	3	0	2	3	13	25	3	2	0
3/23/2016 13:45	66	0	0	0	0	0	0	0	0	2	0	4	4	14	34	6	2	0
3/23/2016 14:00	64	0	0	0	0	0	0	0	0	1	3	0	7	25	21	6	0	1
3/23/2016 14:15	77	0	0	0	0	0	0	0	0	0	1	2	6	25	23	16	3	1
3/23/2016 14:30	62	0	0	0	0	0	0	0	0	1	2	0	7	15	23	11	3	0
3/23/2016 14:45	55	0	0	0	0	0	0	0	0	1	2	1	5	18	21	5	0	2
3/23/2016 15:00	75	0	0	0	0	0	0	0	0	1	5	3	1	12	29	20	3	1
3/23/2016 15:15	90	0	0	0	0	0	0	0	0	1	4	4	13	21	28	15	3	1
3/23/2016 15:30	83	0	0	0	0	0	0	0	0	2	2	0	7	14	41	17	0	0
3/23/2016 15:45	80	0	0	0	0	0	0	0	0	0	0	1	6	19	28	21	5	0
3/23/2016 16:00	73	0	0	0	0	0	0	0	0	0	3	1	2	30	27	10	0	0
3/23/2016 16:15	77	0	0	0	0	0	0	0	0	0	4	1	13	18	27	11	3	0
3/23/2016 16:30	81	0	0	0	0	0	0	0	0	1	7	5	13	25	24	4	1	1
3/23/2016 16:45	83	0	0	0	0	0	0	0	0	1	1	3	13	25	26	12	2	0
3/23/2016 17:00	66	0	0	0	0	0	0	0	0	1	1	4	12	13	25	8	2	0
3/23/2016 17:15	56	0	0	0	0	0	0	0	0	0	1	0	2	15	28	10	0	0
3/23/2016 17:30	75	0	0	0	0	0	0	1	0	2	1	3	7	16	33	11	1	0
3/23/2016 17:45	42	0	0	0	0	0	0	0	0	0	3	2	5	10	19	3	0	0
3/23/2016 18:00	52	0	0	0	0	0	0	0	0	0	1	1	7	14	24	5	0	0
3/23/2016 18:15	42	0	0	0	0	0	0	0	1	1	0	3	2	9	14	10	2	0
3/23/2016 18:30	44	0	0	0	0	0	0	0	0	0	1	0	6	15	17	4	0	1
3/23/2016 18:45	48	0	0	0	0	0	0	0	0	0	1	0	3	15	23	3	1	2
3/23/2016 19:00	27	0	0	0	0	0	0	0	0	2	1	0	2	8	11	1	2	0
3/23/2016 19:15	43	0	0	0	0	0	0	0	0	0	1	3	4	16	14	5	0	0
3/23/2016 19:30	38	0	0	0	0	0	0	0	0	0	0	1	7	11	13	5	0	1
3/23/2016 19:45	28	0	0	0	0	0	0	0	0	1	0	2	8	6	5	6	0	0
3/23/2016 20:00	17	0	0	0	0	0	0	0	1	0	1	2	3	4	4	2	0	0
3/23/2016 20:15	16	0	0	0	0	0	0	0	0	0	1	2	5	4	4	0	0	0
3/23/2016 20:30	16	0	0	0	0	0	0	0	0	0	0	2	4	3	5	1	0	1
3/23/2016 20:45	24	0	0	0	0	0	0	0	0	0	1	3	1	15	3	1	0	0
3/23/2016 21:00	15	0	0	0	0	0	0	0	0	0	0	5	3	2	4	1	0	0

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602332
Route: AZ-89
Location: Btwn BALD EAGLE TRAIL & ROLLING HILLS RD

Site Ref: 2
Direction: SB
Latitude: 34.85875
Longitude: -112.46866

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	14	0	0	0	0	0	0	0	0	0	2	2	0	5	3	2	0	0
3/23/2016 21:30	16	0	0	0	0	0	0	0	0	0	0	0	1	7	5	3	0	0
3/23/2016 21:45	4	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0
3/23/2016 22:00	6	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	1	0
3/23/2016 22:15	6	0	0	0	0	0	0	0	0	0	0	0	2	2	2	0	0	0
3/23/2016 22:30	11	0	0	0	0	0	0	0	0	0	0	1	1	5	1	3	0	0
3/23/2016 22:45	12	0	0	0	0	0	0	0	0	0	0	0	3	2	5	2	0	0
3/23/2016 23:00	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0
3/23/2016 23:15	3	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
3/23/2016 23:30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3/23/2016 23:45	5	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2	0
Day Totals	**4531**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**6**	**46**	**135**	**177**	**417**	**1193**	**1655**	**709**	**149**	**41**

AM Peak Hr	**6:30 AM**	Average Speed	**65.0**	Pct > 25 mph	**100%**		
AM Peak Vol	**459**	Median Speed	**66.0**	Pct > 30 mph	**100%**		
AM PHF	**0.904**	85th Pct Speed	**71.6**	Pct > 35 mph	**100%**		
PM Peak Hr	**3:00 PM**	95th Pct Speed	**74.6**	Pct > 40 mph	**100%**		
PM Peak Vol	**328**	Pace Speed	**60**	Pct > 45 mph	**99%**		
PM PHF	**0.911**	Percent in Pace	**62.3%**	Pct > 50 mph	**96%**		
		Speed Limit	**65**				
		Percent Speedin	**56.4%**				

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602333
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: NB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	2	0	0	1	0	1	0	0	0	0	0	0	0	0	50.0%	0.0%
3/23/2016 0:15	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0.0%	100.0%
3/23/2016 0:30	3	0	0	0	0	0	0	0	0	3	0	0	0	0	0.0%	100.0%
3/23/2016 0:45	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--
3/23/2016 1:15	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:30	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 1:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0%	100.0%
3/23/2016 2:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 2:15	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0.0%	100.0%
3/23/2016 2:30	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0.0%	100.0%
3/23/2016 2:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0%	100.0%
3/23/2016 3:00	9	0	2	2	0	0	0	0	0	4	0	1	0	0	0.0%	55.6%
3/23/2016 3:15	3	0	1	1	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 3:30	7	0	4	1	0	0	0	0	0	2	0	0	0	0	0.0%	28.6%
3/23/2016 3:45	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 4:00	6	0	4	1	0	0	0	0	0	0	0	1	0	0	0.0%	16.7%
3/23/2016 4:15	3	0	1	1	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 4:30	9	0	3	4	0	0	0	0	0	2	0	0	0	0	0.0%	22.2%
3/23/2016 4:45	11	0	5	3	0	1	0	0	0	1	0	1	0	0	9.1%	18.2%
3/23/2016 5:00	14	0	4	7	0	0	0	0	1	1	0	1	0	0	0.0%	21.4%
3/23/2016 5:15	17	0	7	9	0	0	0	0	1	0	0	0	0	0	0.0%	5.9%
3/23/2016 5:30	34	1	14	19	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 5:45	24	0	7	13	0	0	0	0	1	3	0	0	0	0	0.0%	16.7%
3/23/2016 6:00	26	0	9	14	0	1	0	0	0	2	0	0	0	0	3.8%	7.7%
3/23/2016 6:15	42	0	19	19	0	1	0	0	0	3	0	0	0	0	2.4%	7.1%
3/23/2016 6:30	54	0	23	26	0	0	2	0	0	3	0	0	0	0	3.7%	5.6%
3/23/2016 6:45	42	1	16	22	0	0	0	0	0	3	0	0	0	0	0.0%	7.1%
3/23/2016 7:00	34	0	15	9	0	2	0	0	0	7	1	0	0	0	5.9%	23.5%
3/23/2016 7:15	30	0	13	12	1	0	1	0	2	0	1	0	0	0	6.7%	10.0%
3/23/2016 7:30	41	0	21	11	0	0	1	0	0	3	5	0	0	0	2.4%	19.5%
3/23/2016 7:45	25	0	11	13	0	0	0	0	0	1	0	0	0	0	0.0%	4.0%
3/23/2016 8:00	30	0	14	13	0	0	1	0	0	2	0	0	0	0	3.3%	6.7%
3/23/2016 8:15	21	0	10	4	0	0	0	0	2	3	1	1	0	0	0.0%	33.3%
3/23/2016 8:30	31	0	13	9	0	0	0	0	0	5	4	0	0	0	0.0%	29.0%
3/23/2016 8:45	30	0	20	8	0	0	0	0	0	2	0	0	0	0	0.0%	6.7%
3/23/2016 9:00	26	0	17	7	1	0	0	0	0	1	0	0	0	0	3.8%	3.8%
3/23/2016 9:15	39	0	20	10	0	1	0	1	2	2	2	0	0	1	5.1%	17.9%
3/23/2016 9:30	32	0	13	11	1	0	0	0	1	3	3	0	0	0	3.1%	21.9%
3/23/2016 9:45	40	0	17	12	1	0	0	0	4	5	1	0	0	0	2.5%	25.0%
3/23/2016 10:00	27	0	15	8	0	0	1	0	1	2	0	0	0	0	3.7%	11.1%
3/23/2016 10:15	47	0	20	14	0	2	0	0	1	5	5	0	0	0	4.3%	23.4%
3/23/2016 10:30	44	0	25	14	1	1	0	0	0	2	1	0	0	0	4.5%	6.8%
3/23/2016 10:45	31	0	17	12	0	0	0	0	1	1	0	0	0	0	0.0%	6.5%
3/23/2016 11:00	37	1	18	16	0	0	0	0	0	1	0	1	0	0	0.0%	5.4%
3/23/2016 11:15	35	3	12	9	1	0	0	0	1	4	5	0	0	0	2.9%	28.6%
3/23/2016 11:30	38	1	21	9	0	1	1	1	0	2	2	0	0	0	7.9%	10.5%
3/23/2016 11:45	35	0	18	14	0	0	1	0	0	1	0	0	0	1	2.9%	5.7%

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602333
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: NB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	29	2	13	13	0	0	0	0	0	1	0	0	0	0	0.0%	3.4%
3/23/2016 12:15	38	1	17	13	0	0	0	1	0	4	1	0	0	1	2.6%	15.8%
3/23/2016 12:30	37	0	20	12	0	0	0	0	0	2	3	0	0	0	0.0%	13.5%
3/23/2016 12:45	25	1	12	9	1	0	0	0	0	0	0	0	0	2	4.0%	8.0%
3/23/2016 13:00	34	1	20	11	0	0	0	0	0	2	0	0	0	0	0.0%	5.9%
3/23/2016 13:15	42	0	21	14	0	1	0	0	0	4	2	0	0	0	2.4%	14.3%
3/23/2016 13:30	30	0	17	7	1	0	1	0	0	1	3	0	0	0	6.7%	13.3%
3/23/2016 13:45	37	1	11	20	1	0	1	0	0	3	0	0	0	0	5.4%	8.1%
3/23/2016 14:00	21	0	13	7	0	0	0	0	0	1	0	0	0	0	0.0%	4.8%
3/23/2016 14:15	38	0	18	11	0	0	0	0	0	5	3	0	0	1	0.0%	23.7%
3/23/2016 14:30	29	0	21	5	0	0	0	0	0	0	3	0	0	0	0.0%	10.3%
3/23/2016 14:45	34	0	19	11	1	1	0	0	1	1	0	0	0	0	5.9%	5.9%
3/23/2016 15:00	26	0	11	11	0	0	0	0	1	3	0	0	0	0	0.0%	15.4%
3/23/2016 15:15	22	0	11	7	1	0	1	1	0	1	0	0	0	0	13.6%	4.5%
3/23/2016 15:30	28	0	17	9	0	0	0	0	0	2	0	0	0	0	0.0%	7.1%
3/23/2016 15:45	25	0	9	12	0	0	0	0	1	3	0	0	0	0	0.0%	16.0%
3/23/2016 16:00	22	0	7	13	0	0	0	0	0	2	0	0	0	0	0.0%	9.1%
3/23/2016 16:15	34	0	20	11	1	0	1	0	0	1	0	0	0	0	5.9%	2.9%
3/23/2016 16:30	22	0	12	7	0	0	0	0	1	1	0	1	0	0	0.0%	13.6%
3/23/2016 16:45	27	0	14	11	0	0	0	0	0	1	1	0	0	0	0.0%	7.4%
3/23/2016 17:00	28	0	15	10	0	0	0	0	0	1	0	2	0	0	0.0%	10.7%
3/23/2016 17:15	35	0	16	14	1	0	0	0	0	4	0	0	0	0	2.9%	11.4%
3/23/2016 17:30	19	0	8	9	0	1	0	0	0	1	0	0	0	0	5.3%	5.3%
3/23/2016 17:45	19	0	10	8	0	0	0	0	0	1	0	0	0	0	0.0%	5.3%
3/23/2016 18:00	23	0	10	12	0	0	0	0	0	1	0	0	0	0	0.0%	4.3%
3/23/2016 18:15	20	0	11	9	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 18:30	17	0	8	7	0	0	0	0	0	2	0	0	0	0	0.0%	11.8%
3/23/2016 18:45	27	0	12	13	0	1	0	0	0	0	0	1	0	0	3.7%	3.7%
3/23/2016 19:00	16	0	9	5	1	0	0	0	0	1	0	0	0	0	6.3%	6.3%
3/23/2016 19:15	13	0	9	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 19:30	10	0	7	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 19:45	12	0	5	6	0	0	0	0	0	1	0	0	0	0	0.0%	8.3%
3/23/2016 20:00	10	0	6	2	0	0	0	0	0	2	0	0	0	0	0.0%	20.0%
3/23/2016 20:15	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:30	9	0	5	2	0	0	0	0	0	2	0	0	0	0	0.0%	22.2%
3/23/2016 20:45	9	0	5	3	0	0	0	0	0	1	0	0	0	0	0.0%	11.1%
3/23/2016 21:00	8	0	4	3	0	0	0	0	0	1	0	0	0	0	0.0%	12.5%
3/23/2016 21:15	7	0	6	0	0	0	0	0	0	1	0	0	0	0	0.0%	14.3%
3/23/2016 21:30	7	0	2	4	0	0	0	0	0	1	0	0	0	0	0.0%	14.3%
3/23/2016 21:45	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:00	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 22:15	5	0	2	2	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
3/23/2016 22:30	5	0	2	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:45	3	0	1	1	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 23:00	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--
3/23/2016 23:30	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:45	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
Day Totals	**1914**	**13**	**912**	**707**	**14**	**15**	**12**	**4**	**22**	**151**	**47**	**11**	**0**	**6**	**2.4%**	**12.4%**

AM Peak Hr	**6:15 AM**
AM Peak Vol	**172**
AM PHF	**0.796**
PM Peak Hr	**1:00 PM**
PM Peak Vol	**143**
PM PHF	**0.851**

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client:	Burgess & Niple, Inc.	Site Ref:	3
File Number:	1602333	Direction:	NB
Route:	AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)	Latitude:	34.93629
Location:	N of MP 341	Longitude:	-112.43351

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
3/23/2016 0:15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
3/23/2016 0:30	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
3/23/2016 0:45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
3/23/2016 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2016 1:15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3/23/2016 1:30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3/23/2016 1:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
3/23/2016 2:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3/23/2016 2:15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3/23/2016 2:30	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
3/23/2016 2:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
3/23/2016 3:00	9	0	0	0	0	0	0	0	0	0	0	0	3	1	2	2	1	0
3/23/2016 3:15	3	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0
3/23/2016 3:30	7	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	0
3/23/2016 3:45	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0
3/23/2016 4:00	6	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	0
3/23/2016 4:15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0
3/23/2016 4:30	9	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	0	2
3/23/2016 4:45	11	0	0	0	0	0	0	0	0	0	0	0	1	2	5	1	1	1
3/23/2016 5:00	14	0	0	0	0	0	0	0	0	0	0	0	0	2	3	6	1	2
3/23/2016 5:15	17	0	0	0	0	0	0	0	0	0	0	0	0	1	10	5	1	0
3/23/2016 5:30	34	0	0	0	0	0	0	0	0	0	0	0	1	3	17	11	2	0
3/23/2016 5:45	24	0	0	0	0	0	0	0	0	0	0	2	4	1	10	3	3	1
3/23/2016 6:00	26	0	0	0	0	0	0	0	0	0	2	2	0	4	12	5	1	0
3/23/2016 6:15	42	0	0	0	0	0	0	0	0	0	0	0	3	5	18	12	4	0
3/23/2016 6:30	54	0	0	0	0	0	0	0	0	4	1	0	1	12	22	11	2	1
3/23/2016 6:45	42	0	0	0	0	0	1	0	0	0	1	2	2	8	22	6	0	0
3/23/2016 7:00	34	0	0	0	0	0	0	0	0	0	0	0	3	6	18	5	1	1
3/23/2016 7:15	30	0	0	0	0	0	0	0	0	0	0	0	3	6	10	10	1	0
3/23/2016 7:30	41	0	0	0	0	1	0	0	0	0	5	4	1	6	14	9	1	0
3/23/2016 7:45	25	0	0	0	0	0	0	0	0	0	2	0	0	1	12	8	2	0
3/23/2016 8:00	30	0	0	0	0	0	0	0	0	0	0	1	2	5	17	5	0	0
3/23/2016 8:15	21	0	0	0	0	0	0	0	0	0	0	4	4	1	10	2	0	0
3/23/2016 8:30	31	0	0	0	0	0	0	0	0	0	5	2	2	10	9	2	1	0
3/23/2016 8:45	30	0	0	0	0	0	0	0	0	0	0	0	1	7	16	5	1	0
3/23/2016 9:00	26	0	0	0	0	0	0	0	0	0	0	0	2	6	12	5	0	1
3/23/2016 9:15	39	0	0	0	0	0	0	0	0	1	5	7	10	5	8	3	0	0
3/23/2016 9:30	32	0	0	0	0	0	0	0	0	0	4	6	6	5	10	1	0	0
3/23/2016 9:45	40	0	0	0	0	0	0	0	0	0	0	0	5	9	17	7	1	1
3/23/2016 10:00	27	0	0	0	0	0	0	0	0	0	1	0	3	10	11	1	0	1
3/23/2016 10:15	47	0	0	0	0	0	0	0	2	2	1	7	7	14	12	2	0	0
3/23/2016 10:30	44	0	0	0	0	0	0	0	1	1	3	2	7	9	13	7	0	1
3/23/2016 10:45	31	0	0	0	0	0	0	0	0	0	0	0	6	4	15	4	2	0
3/23/2016 11:00	37	0	0	0	0	0	0	0	0	0	0	2	9	2	19	4	1	0
3/23/2016 11:15	35	0	0	0	0	0	0	0	0	3	5	6	8	2	4	5	2	0
3/23/2016 11:30	38	0	0	0	0	0	0	0	0	0	4	2	1	12	13	6	0	0
3/23/2016 11:45	35	0	0	0	0	0	0	0	0	1	6	0	0	5	12	8	3	0
3/23/2016 12:00	29	0	0	0	0	0	0	2	1	0	0	0	1	2	14	6	3	0
3/23/2016 12:15	38	0	0	0	0	0	0	0	3	8	0	1	3	4	13	5	1	0
3/23/2016 12:30	37	0	0	0	0	0	0	0	0	0	5	0	8	5	13	5	0	1
3/23/2016 12:45	25	0	0	0	0	0	0	5	0	0	0	4	1	4	7	4	0	0
3/23/2016 13:00	34	0	0	0	0	0	0	0	0	0	0	0	2	9	15	7	1	0
3/23/2016 13:15	42	0	0	0	0	0	0	0	0	0	1	6	7	8	12	4	3	1
3/23/2016 13:30	30	0	0	0	0	0	0	0	0	1	4	5	7	3	5	4	0	1
3/23/2016 13:45	37	0	0	0	0	0	0	0	0	0	0	0	6	6	21	3	1	0
3/23/2016 14:00	21	0	0	0	0	0	0	0	0	0	0	0	1	3	10	6	1	0
3/23/2016 14:15	38	0	0	0	0	0	0	0	0	3	1	4	4	4	16	6	0	0
3/23/2016 14:30	29	0	0	0	0	0	0	0	0	0	0	1	3	11	8	3	3	0
3/23/2016 14:45	34	0	0	0	0	0	0	0	0	0	0	6	1	7	13	5	2	0
3/23/2016 15:00	26	0	0	0	0	0	0	0	0	1	1	0	3	12	8	1	0	0
3/23/2016 15:15	22	0	0	0	0	0	0	0	0	0	2	2	3	3	4	5	3	0
3/23/2016 15:30	28	0	0	0	0	0	0	0	0	0	0	0	2	5	13	8	0	0
3/23/2016 15:45	25	0	0	0	0	0	0	0	0	0	0	0	3	5	12	5	0	0
3/23/2016 16:00	22	0	0	0	0	0	0	0	0	0	0	0	0	7	10	5	0	0
3/23/2016 16:15	34	0	0	0	0	0	0	0	0	0	3	1	0	7	9	12	2	0
3/23/2016 16:30	22	0	0	0	0	0	0	0	0	0	0	0	1	5	8	8	0	0
3/23/2016 16:45	27	0	0	0	0	0	0	0	0	0	0	0	4	4	11	6	2	0
3/23/2016 17:00	28	0	0	0	0	0	0	0	0	0	0	0	4	2	15	5	2	0
3/23/2016 17:15	35	0	0	0	0	0	0	0	0	0	0	0	0	7	16	9	3	0
3/23/2016 17:30	19	0	0	0	0	0	0	0	0	0	0	0	0	5	4	4	4	2
3/23/2016 17:45	19	0	0	0	0	0	0	0	0	0	0	0	1	4	11	3	0	0
3/23/2016 18:00	23	0	0	0	0	0	0	0	0	0	0	0	0	2	16	4	0	1
3/23/2016 18:15	20	0	0	0	0	0	0	0	0	0	0	0	1	4	10	4	1	0
3/23/2016 18:30	17	0	0	0	0	0	0	0	0	0	0	2	0	4	7	4	0	0
3/23/2016 18:45	27	0	0	0	0	0	0	0	0	0	0	0	1	4	13	5	4	0
3/23/2016 19:00	16	0	0	0	0	0	0	0	0	0	2	0	2	3	3	5	1	0
3/23/2016 19:15	13	0	0	0	0	0	0	0	0	0	0	0	0	4	7	1	1	0
3/23/2016 19:30	10	0	0	0	0	0	0	0	0	0	0	3	0	3	3	1	0	0
3/23/2016 19:45	12	0	0	0	0	0	0	0	0	0	0	0	1	4	4	3	0	0
3/23/2016 20:00	10	0	0	0	0	0	0	0	0	0	0	2	0	1	3	4	0	0
3/23/2016 20:15	5	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0
3/23/2016 20:30	9	0	0	0	0	0	0	0	2	0	0	0	0	2	4	1	0	0
3/23/2016 20:45	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0
3/23/2016 21:00	8	0	0	0	0	0	0	0	0	0	0	0	0	2	0	6	0	0

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602333
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: NB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	7	0	0	0	0	0	0	0	0	0	0	1	0	1	2	3	0	0
3/23/2016 21:30	7	0	0	0	0	0	0	0	0	0	0	0	1	2	3	1	0	0
3/23/2016 21:45	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0
3/23/2016 22:00	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
3/23/2016 22:15	5	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0	0
3/23/2016 22:30	5	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1
3/23/2016 22:45	3	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0
3/23/2016 23:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3/23/2016 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2016 23:30	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
3/23/2016 23:45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Day Totals	**1914**	**0**	**0**	**0**	**0**	**1**	**1**	**7**	**9**	**25**	**64**	**88**	**170**	**341**	**762**	**351**	**76**	**19**

AM Peak Hr	**6:15 AM**	Average Speed	**65.2**	Pct > 25 mph	**100%**		
AM Peak Vol	**172**	Median Speed	**66.5**	Pct > 30 mph	**100%**		
AM PHF	**0.796**	85th Pct Speed	**72.1**	Pct > 35 mph	**100%**		
PM Peak Hr	**1:00 PM**	95th Pct Speed	**75.0**	Pct > 40 mph	**99%**		
PM Peak Vol	**143**	Pace Speed	**62**	Pct > 45 mph	**98%**		
PM PHF	**0.851**	Percent in Pace	**58.5%**	Pct > 50 mph	**94%**		
		Speed Limit	**65**				
		Percent Speedin	**63.1%**				

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602334
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: SB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 0:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:15	4	0	2	1	1	0	0	0	0	0	0	0	0	0	25.0%	0.0%
3/23/2016 0:30	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 0:45	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 1:00	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0.0%	50.0%
3/23/2016 1:15	3	0	0	1	0	0	0	0	0	1	1	0	0	0	0.0%	66.7%
3/23/2016 1:30	3	0	1	0	0	0	0	0	0	2	0	0	0	0	0.0%	66.7%
3/23/2016 1:45	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 2:00	3	0	0	2	0	0	0	0	0	1	0	0	0	0	0.0%	33.3%
3/23/2016 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--
3/23/2016 2:30	2	0	0	0	0	1	0	0	0	0	0	0	0	1	50.0%	50.0%
3/23/2016 2:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0.0%	100.0%
3/23/2016 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--
3/23/2016 3:15	5	0	3	1	0	0	0	0	0	1	0	0	0	0	0.0%	20.0%
3/23/2016 3:30	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--
3/23/2016 4:00	5	0	1	0	0	0	0	0	0	2	1	0	0	1	0.0%	80.0%
3/23/2016 4:15	5	0	1	1	0	0	0	0	1	0	1	1	0	0	0.0%	60.0%
3/23/2016 4:30	2	0	0	0	0	0	0	0	0	2	0	0	0	0	0.0%	100.0%
3/23/2016 4:45	4	0	2	1	0	0	0	0	0	1	0	0	0	0	0.0%	25.0%
3/23/2016 5:00	6	0	1	2	0	0	0	0	0	1	1	0	0	1	0.0%	50.0%
3/23/2016 5:15	6	0	2	1	1	0	0	0	0	2	0	0	0	0	16.7%	33.3%
3/23/2016 5:30	9	0	5	2	0	0	0	0	0	2	0	0	0	0	0.0%	22.2%
3/23/2016 5:45	8	0	1	4	0	1	0	0	1	1	0	0	0	0	12.5%	25.0%
3/23/2016 6:00	8	0	4	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 6:15	9	0	4	5	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 6:30	17	0	8	6	0	0	0	0	1	1	0	0	0	1	0.0%	17.6%
3/23/2016 6:45	13	0	3	8	0	0	0	0	0	0	1	1	0	0	0.0%	15.4%
3/23/2016 7:00	17	0	8	6	0	1	1	0	0	0	1	0	0	0	11.8%	5.9%
3/23/2016 7:15	10	0	4	6	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 7:30	9	0	5	3	0	0	0	0	0	1	0	0	0	0	0.0%	11.1%
3/23/2016 7:45	23	0	7	8	4	1	0	0	0	1	2	0	0	0	21.7%	13.0%
3/23/2016 8:00	18	0	10	6	0	0	0	0	0	2	0	0	0	0	0.0%	11.1%
3/23/2016 8:15	18	0	8	6	1	1	0	0	1	0	1	0	0	0	11.1%	11.1%
3/23/2016 8:30	33	0	13	17	0	1	0	0	1	1	0	0	0	0	3.0%	6.1%
3/23/2016 8:45	24	0	9	7	4	0	0	1	0	1	2	0	0	0	20.8%	12.5%
3/23/2016 9:00	26	0	10	9	2	0	0	0	0	2	3	0	0	0	7.7%	19.2%
3/23/2016 9:15	28	0	9	15	0	0	1	0	1	2	0	0	0	0	3.6%	10.7%
3/23/2016 9:30	35	0	16	17	0	0	0	0	1	1	0	0	0	0	0.0%	5.7%
3/23/2016 9:45	26	0	8	8	5	1	0	0	0	3	1	0	0	0	23.1%	15.4%
3/23/2016 10:00	33	0	12	15	0	1	1	0	2	2	0	0	0	0	6.1%	12.1%
3/23/2016 10:15	30	0	17	11	1	0	0	0	0	0	1	0	0	0	3.3%	3.3%
3/23/2016 10:30	34	0	16	12	1	1	0	1	1	1	0	1	0	0	8.8%	8.8%
3/23/2016 10:45	37	0	16	14	3	3	1	0	0	0	0	0	0	0	18.9%	0.0%
3/23/2016 11:00	37	0	18	17	0	0	0	0	0	1	1	0	0	0	0.0%	5.4%
3/23/2016 11:15	31	0	14	12	1	1	0	0	0	3	0	0	0	0	6.5%	9.7%
3/23/2016 11:30	37	1	13	17	2	0	1	1	0	2	0	0	0	0	10.8%	5.4%
3/23/2016 11:45	38	0	19	13	3	1	0	0	1	0	1	0	0	0	10.5%	5.3%

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Client: Burgess & Niple, Inc.
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Location: N of MP 341

Site Ref: 3
Direction: SB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	cls01	cls02	cls03	cls04	cls05	cls06	cls07	cls08	cls09	cls10	cls11	cls12	cls13	pct SU	pct CB
3/23/2016 12:00	29	0	18	8	1	1	0	0	0	0	0	0	0	1	6.9%	3.4%
3/23/2016 12:15	35	2	13	16	1	0	0	0	0	2	1	0	0	0	2.9%	8.6%
3/23/2016 12:30	40	0	14	19	3	0	0	0	0	2	2	0	0	0	7.5%	10.0%
3/23/2016 12:45	42	0	20	18	4	0	0	0	0	0	0	0	0	0	9.5%	0.0%
3/23/2016 13:00	26	0	12	11	2	0	0	0	0	1	0	0	0	0	7.7%	3.8%
3/23/2016 13:15	23	0	8	8	2	1	1	0	1	1	0	0	0	1	17.4%	13.0%
3/23/2016 13:30	32	0	14	14	2	0	0	0	2	0	0	0	0	0	6.3%	6.3%
3/23/2016 13:45	27	0	17	4	0	1	1	1	0	2	0	0	0	1	11.1%	11.1%
3/23/2016 14:00	33	0	20	11	0	1	0	0	0	0	1	0	0	0	3.0%	3.0%
3/23/2016 14:15	36	2	13	19	0	0	0	0	0	1	1	0	0	0	0.0%	5.6%
3/23/2016 14:30	36	0	18	14	0	0	0	1	1	1	0	0	0	1	2.8%	8.3%
3/23/2016 14:45	26	1	9	13	0	0	1	1	0	1	0	0	0	0	7.7%	3.8%
3/23/2016 15:00	54	0	19	26	4	1	2	0	0	1	1	0	0	0	13.0%	3.7%
3/23/2016 15:15	37	0	19	14	0	1	0	1	1	0	0	0	0	1	5.4%	5.4%
3/23/2016 15:30	49	2	29	16	0	0	1	0	1	0	0	0	0	0	2.0%	2.0%
3/23/2016 15:45	54	1	28	19	2	0	0	1	0	1	2	0	0	0	5.6%	5.6%
3/23/2016 16:00	56	0	22	30	0	1	1	0	0	1	1	0	0	0	3.6%	3.6%
3/23/2016 16:15	56	0	23	28	0	3	0	0	0	2	0	0	0	0	5.4%	3.6%
3/23/2016 16:30	54	0	23	27	0	1	1	0	1	1	0	0	0	0	3.7%	3.7%
3/23/2016 16:45	49	0	25	22	0	0	0	0	1	1	0	0	0	0	0.0%	4.1%
3/23/2016 17:00	41	0	25	14	0	1	0	0	0	0	1	0	0	0	2.4%	2.4%
3/23/2016 17:15	36	0	12	21	0	0	0	0	1	1	1	0	0	0	0.0%	8.3%
3/23/2016 17:30	34	1	18	14	0	0	1	0	0	0	0	0	0	0	2.9%	0.0%
3/23/2016 17:45	31	1	12	17	0	0	0	0	0	0	0	0	0	1	0.0%	3.2%
3/23/2016 18:00	20	0	13	5	1	0	0	0	0	0	0	0	0	1	5.0%	5.0%
3/23/2016 18:15	25	0	13	9	0	0	0	0	0	3	0	0	0	0	0.0%	12.0%
3/23/2016 18:30	24	0	12	12	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 18:45	28	0	19	7	1	0	0	0	0	0	0	0	1	0	3.6%	3.6%
3/23/2016 19:00	13	0	4	6	0	0	1	0	0	1	1	0	0	0	7.7%	15.4%
3/23/2016 19:15	14	0	8	5	0	1	0	0	0	0	0	0	0	0	7.1%	0.0%
3/23/2016 19:30	16	0	8	7	0	0	0	0	0	0	0	0	0	1	0.0%	6.3%
3/23/2016 19:45	15	0	7	6	0	0	0	0	0	1	0	1	0	0	0.0%	13.3%
3/23/2016 20:00	8	0	3	4	0	0	0	0	0	1	0	0	0	0	0.0%	12.5%
3/23/2016 20:15	12	0	5	6	0	0	0	0	0	1	0	0	0	0	0.0%	8.3%
3/23/2016 20:30	9	0	6	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 20:45	8	0	4	4	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:00	9	0	7	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 21:15	12	0	8	0	0	0	0	0	0	0	3	0	0	1	0.0%	33.3%
3/23/2016 21:30	11	0	6	4	0	0	0	0	0	0	1	0	0	0	0.0%	9.1%
3/23/2016 21:45	3	0	2	1	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:00	4	0	2	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 22:15	7	0	6	0	0	0	0	0	0	0	1	0	0	0	0.0%	14.3%
3/23/2016 22:30	9	0	3	5	0	1	0	0	0	0	0	0	0	0	11.1%	0.0%
3/23/2016 22:45	5	0	2	3	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
3/23/2016 23:00	3	0	1	1	0	0	0	0	0	0	1	0	0	0	0.0%	33.3%
3/23/2016 23:15	2	0	1	0	0	1	0	0	0	0	0	0	0	0	50.0%	0.0%
3/23/2016 23:30	2	0	0	1	0	0	0	0	0	1	0	0	0	0	0.0%	50.0%
3/23/2016 23:45	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%
Day Totals	**1865**	**11**	**847**	**759**	**52**	**29**	**15**	**8**	**20**	**69**	**36**	**4**	**1**	**14**	**5.6%**	**7.7%**

AM Peak Hr	**11:00 AM**
AM Peak Vol	**143**
AM PHF	**0.941**
PM Peak Hr	**3:45 PM**
PM Peak Vol	**220**
PM PHF	**0.982**

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602334
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: SB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 0:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
3/23/2016 0:15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1
3/23/2016 0:30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3/23/2016 0:45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
3/23/2016 1:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
3/23/2016 1:15	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
3/23/2016 1:30	3	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0
3/23/2016 1:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3/23/2016 2:00	3	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0
3/23/2016 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2016 2:30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
3/23/2016 2:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3/23/2016 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2016 3:15	5	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0
3/23/2016 3:30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
3/23/2016 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2016 4:00	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	0
3/23/2016 4:15	5	0	0	0	0	0	0	0	0	0	0	1	0	2	1	1	0	0
3/23/2016 4:30	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
3/23/2016 4:45	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
3/23/2016 5:00	6	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	1	1
3/23/2016 5:15	6	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	0	0
3/23/2016 5:30	9	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0
3/23/2016 5:45	8	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	2	1
3/23/2016 6:00	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	1
3/23/2016 6:15	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	6	0
3/23/2016 6:30	17	0	0	0	0	0	0	0	0	0	0	0	1	1	5	4	6	0
3/23/2016 6:45	13	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7	1	1
3/23/2016 7:00	17	0	0	0	0	0	0	0	0	0	0	0	1	0	3	6	6	1
3/23/2016 7:15	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	2	4
3/23/2016 7:30	9	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	0
3/23/2016 7:45	23	0	0	0	0	0	0	0	0	0	0	0	1	1	7	7	5	2
3/23/2016 8:00	18	0	0	0	0	0	0	0	0	0	0	0	0	1	2	10	5	0
3/23/2016 8:15	18	0	0	0	0	0	0	0	0	0	0	0	0	2	3	10	1	2
3/23/2016 8:30	33	0	0	0	0	0	0	0	0	0	0	0	0	7	12	8	6	0
3/23/2016 8:45	24	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	5	1
3/23/2016 9:00	26	0	0	0	0	0	0	0	0	0	0	0	0	3	6	12	3	2
3/23/2016 9:15	28	0	0	0	0	0	0	0	0	0	0	2	0	3	10	10	3	0
3/23/2016 9:30	35	0	0	0	0	0	0	0	0	0	0	0	1	2	10	19	2	1
3/23/2016 9:45	26	0	0	0	0	0	0	0	0	0	0	0	0	1	13	9	3	0
3/23/2016 10:00	33	0	0	0	0	0	0	0	0	0	0	0	0	3	9	15	3	3
3/23/2016 10:15	30	0	0	0	0	0	0	0	0	0	0	0	0	3	6	16	5	0
3/23/2016 10:30	34	0	0	0	0	0	0	0	0	0	0	0	0	4	16	7	5	2
3/23/2016 10:45	37	0	0	0	0	0	0	0	0	0	0	1	1	3	17	10	5	0
3/23/2016 11:00	37	0	0	0	0	0	0	0	0	0	0	0	0	3	14	17	2	1
3/23/2016 11:15	31	0	0	0	0	0	0	0	0	0	0	0	1	4	12	13	1	0
3/23/2016 11:30	37	0	0	0	0	0	0	0	0	0	0	0	1	0	17	10	8	1
3/23/2016 11:45	38	0	0	0	0	0	0	0	0	0	0	0	0	3	10	19	6	0
3/23/2016 12:00	29	0	0	0	0	0	0	0	0	0	0	0	0	8	12	8	1	0
3/23/2016 12:15	35	0	0	0	0	0	0	0	0	0	0	0	0	3	13	16	2	1
3/23/2016 12:30	40	0	0	0	0	0	0	0	0	0	0	0	0	3	19	15	3	0
3/23/2016 12:45	42	0	0	0	0	0	0	0	0	0	0	0	2	6	19	10	5	0
3/23/2016 13:00	26	0	0	0	0	0	0	0	0	0	0	0	1	4	7	10	2	2
3/23/2016 13:15	23	0	0	0	0	0	0	0	0	0	0	0	1	3	9	7	3	0
3/23/2016 13:30	32	0	0	0	0	0	0	0	0	0	2	0	0	6	10	11	3	0
3/23/2016 13:45	27	0	0	0	0	0	0	0	0	0	0	0	1	4	11	8	2	1
3/23/2016 14:00	33	0	0	0	0	0	0	0	0	0	0	0	0	0	18	14	1	0
3/23/2016 14:15	36	0	0	0	0	0	0	0	0	0	0	0	2	4	14	10	5	1
3/23/2016 14:30	36	0	0	0	0	0	0	0	0	0	0	0	1	3	18	10	4	0
3/23/2016 14:45	26	0	0	0	0	0	0	0	0	0	0	0	1	3	9	9	4	0
3/23/2016 15:00	54	0	0	0	0	0	0	0	0	0	0	0	0	5	22	19	5	3
3/23/2016 15:15	37	0	0	0	0	0	0	0	0	0	0	0	1	4	16	13	3	0
3/23/2016 15:30	49	0	0	0	0	0	0	0	0	0	0	0	0	5	16	25	2	1
3/23/2016 15:45	54	0	0	0	0	0	0	0	0	0	0	1	0	3	23	21	4	2
3/23/2016 16:00	56	0	0	0	0	0	0	0	0	0	0	0	0	3	22	20	10	1
3/23/2016 16:15	56	0	0	0	0	0	0	0	0	0	0	0	2	13	24	12	5	0
3/23/2016 16:30	54	0	0	0	0	0	0	0	0	0	0	0	1	12	24	14	1	2
3/23/2016 16:45	49	0	0	0	0	0	0	0	0	0	0	0	2	0	15	23	7	2
3/23/2016 17:00	41	0	0	0	0	0	0	0	0	0	0	1	0	2	19	13	4	2
3/23/2016 17:15	36	0	0	0	0	0	0	0	0	0	0	0	0	0	12	19	4	1
3/23/2016 17:30	34	0	0	0	0	0	0	0	0	0	0	0	0	2	8	19	5	0
3/23/2016 17:45	31	0	0	0	0	0	0	0	0	0	0	0	1	0	10	17	3	0
3/23/2016 18:00	20	0	0	0	0	0	0	0	0	0	0	0	1	0	9	8	2	0
3/23/2016 18:15	25	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	2	1
3/23/2016 18:30	24	0	0	0	0	0	0	0	0	0	0	0	0	1	8	7	7	1
3/23/2016 18:45	28	0	0	0	0	0	0	0	0	0	0	0	0	1	9	12	3	3
3/23/2016 19:00	13	0	0	0	0	0	0	0	0	0	0	0	0	1	5	4	2	1
3/23/2016 19:15	14	0	0	0	0	0	0	0	0	0	0	1	0	1	4	4	4	0
3/23/2016 19:30	16	0	0	0	0	0	0	0	0	0	0	0	1	0	3	7	2	3
3/23/2016 19:45	15	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7	2	0
3/23/2016 20:00	8	0	0	0	0	0	0	0	0	0	0	0	0	3	2	3	0	0
3/23/2016 20:15	12	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	4	0
3/23/2016 20:30	9	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0
3/23/2016 20:45	8	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	1	0
3/23/2016 21:00	9	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	2

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Client: Burgess & Niple, Inc.
File Number: 1602334
Route: AZ-89 (NEAR TOP OF HILL @ 1000' N/O MP341)
Location: N of MP 341

Site Ref: 3
Direction: SB
Latitude: 34.93629
Longitude: -112.43351

Date/Time	Total	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80+
3/23/2016 21:15	12	0	0	0	0	0	0	0	0	0	1	0	0	0	5	4	2	0
3/23/2016 21:30	11	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	5	1
3/23/2016 21:45	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
3/23/2016 22:00	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	1
3/23/2016 22:15	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1	0
3/23/2016 22:30	9	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3	2	0
3/23/2016 22:45	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0
3/23/2016 23:00	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
3/23/2016 23:15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3/23/2016 23:30	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
3/23/2016 23:45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
Day Totals	**1865**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**8**	**29**	**156**	**677**	**688**	**242**	**62**

AM Peak Hr	**11:00 AM**	Average Speed	**70.5**	Pct > 25 mph	**100%**		
AM Peak Vol	**143**	Median Speed	**70.6**	Pct > 30 mph	**100%**		
AM PHF	**0.941**	85th Pct Speed	**75.7**	Pct > 35 mph	**100%**		
PM Peak Hr	**3:45 PM**	95th Pct Speed	**79.2**	Pct > 40 mph	**100%**		
PM Peak Vol	**220**	Pace Speed	**65**	Pct > 45 mph	**100%**		
PM PHF	**0.982**	Percent in Pace	**72.5%**	Pct > 50 mph	**100%**		
		Speed Limit	**65**				
		Percent Speedin	**89.5%**				

Traffic Research and Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Site ID	File Name	Route	Location	Direction	Count Type	Count Dur	Start Date	Start Time	Avg Vol	AM PkHr	AM PkVol	AM PHF	PM PkHr	PM PkVol	PM PHF	Day Corr	Dir Split	pctSU	pctCB	Avg Spd	Spd 50pct	Spd 85pct
1	1602329	AZ-89	N of E RD 3 N	NB	SPD	24	3/23/2016	0:00	6470	11:15	391	0.9399	16:00	615	0.9433	1.0000	50.2%	2.5%	2.8%	52.202	52.3	57.8
1	1602330	AZ-89	N of E RD 3 N	SB	SPD	24	3/23/2016	0:00	6431	6:30	563	0.8965	15:15	489	0.8989	1.0000	49.8%	2.2%	2.9%	45.554	45.8	51.7
2	1602331	AZ-89	Btwn BALD EAGLE TRAIL & ROLLING HILLS R	NB	SPD	24	3/23/2016	0:00	4631	11:15	282	0.8924	16:30	466	0.9173	1.0000	50.5%	1.8%	4.9%	62.349	62.8	67.9
2	1602332	AZ-89	Btwn BALD EAGLE TRAIL & ROLLING HILLS R	SB	SPD	24	3/23/2016	0:00	4531	6:30	459	0.9035	15:00	328	0.9111	1.0000	49.5%	3.7%	3.7%	64.995	66.0	71.6
3	1602333	AZ-89	N of MP 341	NB	SPD	24	3/23/2016	0:00	1914	6:15	172	0.7963	13:00	143	0.8512	1.0000	50.6%	2.4%	12.4%	65.189	66.5	72.0
3	1602334	AZ-89	N of MP 341	SB	SPD	24	3/23/2016	0:00	1865	11:00	143	0.9408	15:45	220	0.9821	1.0000	49.4%	5.6%	7.7%	70.490	70.4	75.5

Traffic Research and Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

Site ID	File Name	Route	Location	Direction	Latitude	Longitude	Comments
1	1602329	AZ-89	N of E RD 3 N	NB	34.7784	-112.4528	
1	1602330	AZ-89	N of E RD 3 N	SB	34.7784	-112.4528	
2	1602331	AZ-89	Btwn BALD EAGLE TRAIL & ROLLING HILLS R	NB	34.8588	-112.4687	
2	1602332	AZ-89	Btwn BALD EAGLE TRAIL & ROLLING HILLS R	SB	34.8588	-112.4687	SPC ADJ 939mm
3	1602333	AZ-89	N of MP 341	NB	34.9363	-112.4335	NEAR TOP OF HILL @ 1000' N/O MP341
3	1602334	AZ-89	N of MP 341	SB	34.9363	-112.4335	NEAR TOP OF HILL @ 1000' N/O MP341

Traffic Research & Analysis, Inc.
3844 E. Indian School Rd.
Phoenix, AZ 85018
(602) 840-1500 FAX (602) 840-1577

Job Number	File ID	North / South Streets	East / West Streets	Start Date / Time	End Date /Time	Count Intvl	Count Total	Peak Hour	Peak Hr Total	Peak Hr Factor
15146	1602336	AZ 89	E RD 3 N	3/23/16 7:00	3/23/16 8:45	15	2371	7:00 AM	1254	0.8831
15146	1602336	AZ 89	E RD 3 N	3/23/16 16:00	3/23/16 17:45	15	2893	4:15 PM	1518	0.9806
15146	1602337	AZ89	W RD 4 N	3/23/16 7:00	3/23/16 8:45	15	1672	7:00 AM	920	0.8915
15146	1602337	AZ89	W RD 4 N	3/23/16 16:00	3/23/16 17:45	15	2135	4:00 PM	1110	0.9158
15146	1602338	AZ 89	ROLLING HILLS RD	3/23/16 7:00	3/23/16 8:45	15	1149	7:00 AM	642	0.9331
15146	1602338	AZ 89	ROLLING HILLS RD	3/23/16 16:00	3/23/16 17:45	15	1494	4:00 PM	784	0.9159
15146	1602339	AZ 89	BIG CHINO RD	3/23/16 7:00	3/23/16 8:45	15	1046	7:00 AM	592	0.9024
15146	1602339	AZ 89	BIG CHINO RD	3/23/16 16:00	3/23/16 17:45	15	1496	4:00 PM	787	0.9789
15146	1602340	AZ 89	BRAMBLE DR	3/23/16 7:00	3/23/16 8:45	15	554	7:00 AM	295	0.8676
15146	1602340	AZ 89	BRAMBLE DR	3/23/14 16:00	3/23/14 17:45	15	857	4:00 PM	476	0.9597

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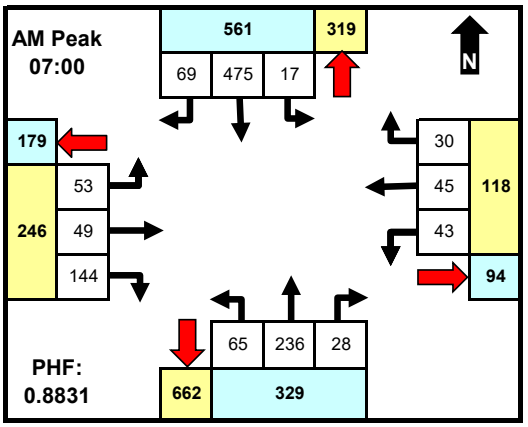
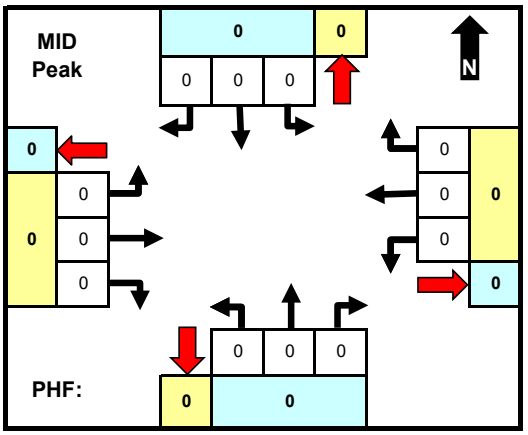
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

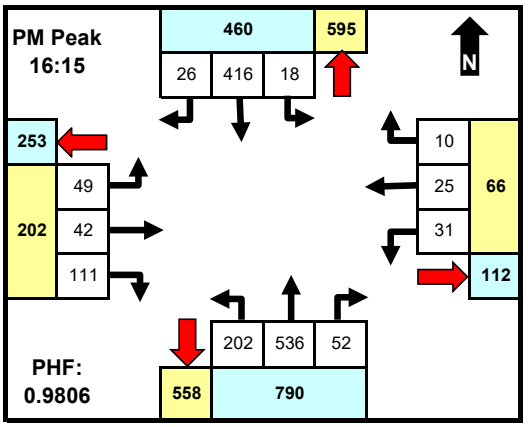
Intersection TMC: 1602336
Count Date: 3/23/2016



	From North				From East				From South				From West				INTSEC
	AZ 89				E RD 3 N				AZ 89				E RD 3 N				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	5	139	21	0	11	13	5	0	9	46	5	0	10	9	35	0	308
7:15	2	130	24	0	13	18	13	0	21	66	9	0	17	14	28	0	355
7:30	7	93	13	0	7	7	3	0	18	52	8	0	15	15	38	0	276
7:45	3	113	11	0	12	7	9	0	17	72	6	0	11	11	43	0	315
8:00	1	119	7	0	12	3	2	0	16	62	4	0	13	8	28	0	275
8:15	5	116	10	0	11	6	3	0	22	72	5	0	9	5	41	0	305
8:30	0	104	5	0	8	5	5	0	31	51	7	0	12	4	24	0	256
8:45	1	102	10	0	13	6	0	0	30	76	6	0	7	5	25	0	281
Total	24	916	101	0	87	65	40	0	164	497	50	0	94	71	262	0	2371
Pk Hr																	7:00 AM
Pk Vol	17	475	69	0	43	45	30	0	65	236	28	0	53	49	144	0	1254
PHF	0.607	0.854	0.719	0.000	0.827	0.625	0.577	0.000	0.774	0.819	0.778	0.000	0.779	0.817	0.837	0.000	0.883



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	2	113	6	0	11	7	4	0	41	131	6	0	30	12	18	0	381
16:15	3	106	7	0	6	3	0	0	48	132	19	0	8	10	26	0	368
16:30	7	99	3	0	8	6	3	0	55	142	10	0	14	11	20	0	378
16:45	5	112	8	0	6	10	4	0	47	127	9	0	17	12	30	0	387
17:00	3	99	8	0	11	6	3	0	52	135	14	0	10	9	35	0	385
17:15	2	80	4	0	12	7	4	0	39	122	6	0	14	8	28	0	326
17:30	2	95	8	0	8	8	7	0	49	135	17	0	12	7	15	0	363
17:45	1	65	4	0	10	4	6	0	44	129	8	0	12	5	17	0	305
Total	25	769	48	0	72	51	31	0	375	1053	89	0	117	74	189	0	2893
Pk Hr																	4:15 PM
Pk Vol	18	416	26	0	31	25	10	0	202	536	52	0	49	42	111	0	1518
PHF	0.643	0.929	0.813	0.000	0.705	0.625	0.625	0.000	0.918	0.944	0.684	0.000	0.721	0.875	0.793	0.000	0.981

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:00 AM	1254	7:15 AM	355	0.883
MID					
PM	4:15 PM	1518	4:45 PM	387	0.981

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	7:00 AM	561	0.850	7:00 AM	118	0.670	8:00 AM	382	0.853	7:00 AM	246	0.904
MID												
PM	4:00 PM	471	0.942	4:45 PM	86	0.935	4:15 PM	790	0.954	4:00 PM	208	0.867

Comments

Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	1041	631	192	145	711	1265	427	330
MID	0	0	0	0	0	0	0	0
PM	842	1201	154	188	1517	1030	380	474

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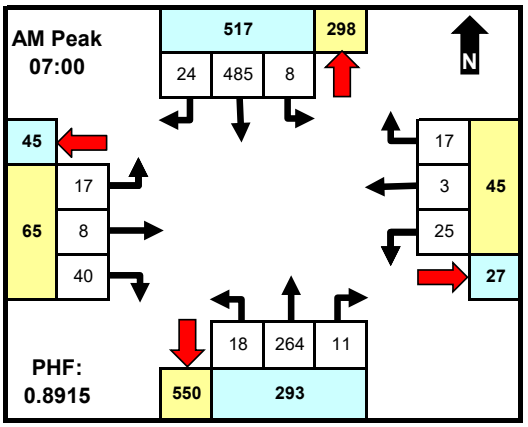
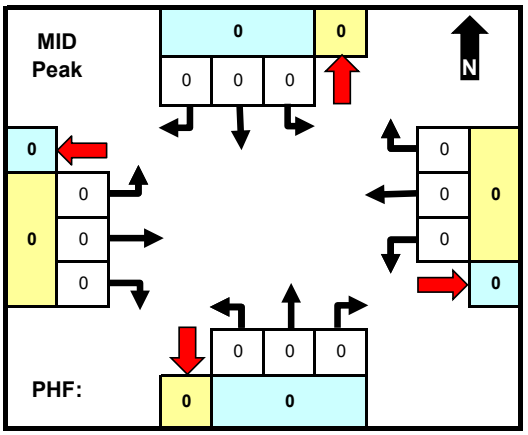
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

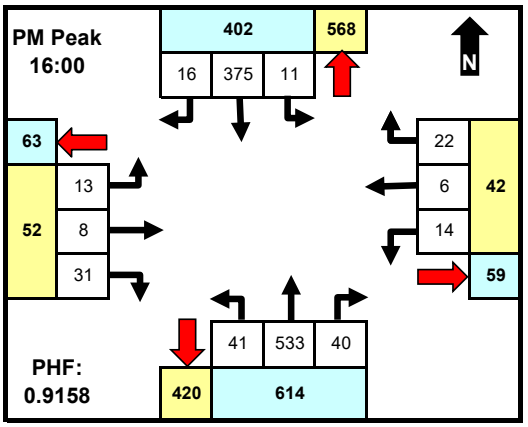
Intersection TMC: 1602337
Count Date: 3/23/2016



	From North				From East				From South				From West				INTSEC
	AZ89				W RD 4 N				AZ89				W RD 4 N				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	0	126	9	0	6	0	6	0	2	63	1	0	5	3	18	0	239
7:15	1	140	7	0	4	1	6	0	5	77	3	0	3	3	8	0	258
7:30	3	115	5	0	8	1	4	0	7	57	3	0	5	1	8	0	217
7:45	4	104	3	0	7	1	1	0	4	67	4	0	4	1	6	0	206
8:00	1	118	3	0	4	0	3	0	0	63	3	0	8	0	11	0	214
8:15	0	103	1	0	6	0	2	0	6	59	3	0	2	1	3	0	186
8:30	1	96	3	0	6	0	1	0	2	54	0	0	4	0	8	0	175
8:45	0	80	1	0	4	2	2	0	3	70	1	0	6	0	8	0	177
Total	10	882	32	0	45	5	25	0	29	510	18	0	37	9	70	0	1672
Pk Hr																	7:00 AM
Pk Vol	8	485	24	0	25	3	17	0	18	264	11	0	17	8	40	0	920
PHF	0.500	0.866	0.667	0.000	0.781	0.750	0.708	0.000	0.643	0.857	0.688	0.000	0.850	0.667	0.556	0.000	0.891



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	2	97	8	0	3	2	5	0	11	141	18	0	3	2	11	0	303
16:15	3	89	3	0	2	0	5	0	5	125	6	0	4	0	10	0	252
16:30	6	87	1	0	5	0	2	0	15	133	8	0	3	2	6	0	268
16:45	0	102	4	0	4	4	10	0	10	134	8	0	3	4	4	0	287
17:00	6	90	5	0	8	2	8	0	10	135	8	0	1	1	4	0	278
17:15	0	77	2	0	4	2	7	0	10	137	4	0	2	1	9	0	255
17:30	5	72	3	0	4	2	5	0	7	120	8	0	1	0	8	0	235
17:45	1	69	3	0	3	1	8	0	16	130	10	0	4	3	9	0	257
Total	23	683	29	0	33	13	50	0	84	1055	70	0	21	13	61	0	2135
Pk Hr																	4:00 PM
Pk Vol	11	375	16	0	14	6	22	0	41	533	40	0	13	8	31	0	1110
PHF	0.458	0.919	0.500	0.000	0.700	0.375	0.550	0.000	0.683	0.945	0.556	0.000	0.813	0.500	0.705	0.000	0.916

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:00 AM	920	7:15 AM	258	0.891
MID					
PM	4:00 PM	1110	4:00 PM	303	0.916

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	7:00 AM	517	0.873	7:00 AM	45	0.865	7:00 AM	293	0.862	7:00 AM	65	0.625
MID												
PM	4:00 PM	402	0.939	4:45 PM	60	0.833	4:00 PM	614	0.903	4:00 PM	52	0.813

Comments

Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	924	572	75	37	557	997	116	66
MID	0	0	0	0	0	0	0	0
PM	735	1126	96	106	1209	777	95	126

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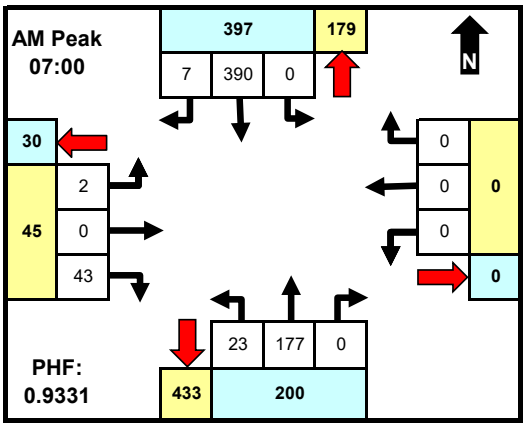
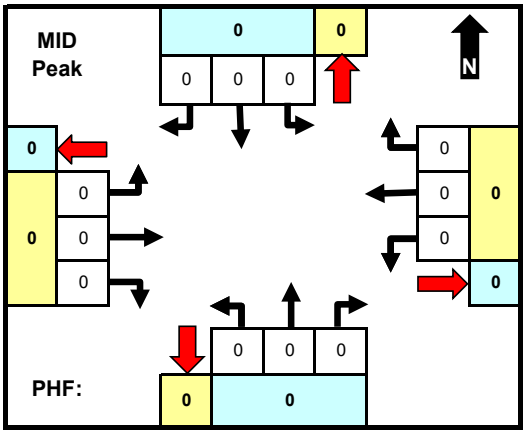
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

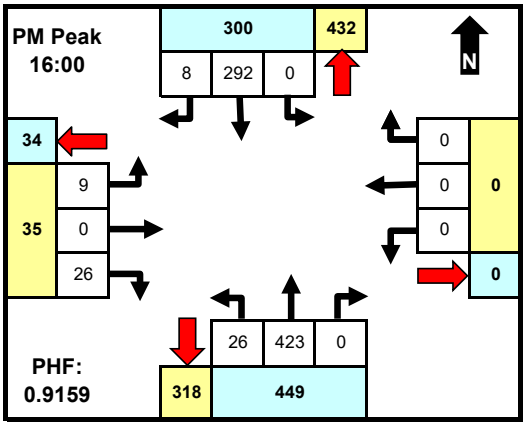
Intersection TMC: 1602338
Count Date: 3/23/2016



	From North				From East				From South				From West				INTSEC
	AZ 89				ROLLING HILLS RD				AZ 89				ROLLING HILLS RD				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	0	116	1	0	0	0	0	0	5	36	0	0	2	0	11	0	171
7:15	0	106	0	0	0	0	0	0	4	53	0	0	0	0	9	0	172
7:30	0	82	2	0	0	0	0	0	11	52	0	0	0	0	9	0	156
7:45	0	86	4	0	0	0	0	0	3	36	0	0	0	0	14	0	143
8:00	0	87	2	0	0	0	0	0	1	49	0	0	2	0	7	0	148
8:15	0	63	3	0	0	0	0	0	3	47	0	0	1	0	6	0	123
8:30	0	70	2	0	0	0	0	0	3	26	0	0	1	0	10	0	112
8:45	0	60	0	0	0	0	0	0	3	53	0	0	2	0	6	0	124
Total	0	670	14	0	0	0	0	0	33	352	0	0	8	0	72	0	1149
Pk Hr																	7:00 AM
Pk Vol	0	390	7	0	0	0	0	0	23	177	0	0	2	0	43	0	642
PHF	0.000	0.841	0.438	0.000	0.000	0.000	0.000	0.000	0.523	0.835	0.000	0.000	0.250	0.000	0.768	0.000	0.933



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	0	79	4	0	0	0	0	0	10	116	0	0	2	0	3	0	214
16:15	0	62	1	0	0	0	0	0	6	95	0	0	0	0	5	0	169
16:30	0	79	2	0	0	0	0	0	4	114	0	0	3	0	9	0	211
16:45	0	72	1	0	0	0	0	0	6	98	0	0	4	0	9	0	190
17:00	0	54	0	0	0	0	0	0	13	112	0	0	0	0	6	0	185
17:15	0	56	2	0	0	0	0	0	11	106	0	0	1	0	3	0	179
17:30	0	66	4	0	0	0	0	0	8	101	0	0	1	0	9	0	189
17:45	0	42	1	0	0	0	0	0	7	104	0	0	2	0	1	0	157
Total	0	510	15	0	0	0	0	0	65	846	0	0	13	0	45	0	1494
Pk Hr																	4:00 PM
Pk Vol	0	292	8	0	0	0	0	0	26	423	0	0	9	0	26	0	784
PHF	0.000	0.924	0.500	0.000	0.000	0.000	0.000	0.000	0.650	0.912	0.000	0.000	0.563	0.000	0.722	0.000	0.916

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:00 AM	642	7:15 AM	172	0.933
MID					
PM	4:00 PM	784	4:00 PM	214	0.916

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	7:00 AM	397	0.848				7:15 AM	209	0.829	7:00 AM	45	0.804
MID												
PM	4:00 PM	300	0.904				4:30 PM	464	0.928	4:15 PM	36	0.692

Comments

Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	684	360	0	0	385	742	80	47
MID	0	0	0	0	0	0	0	0
PM	525	859	0	0	911	555	58	80

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3844 East Indian School Road
Phoenix, AZ 85018
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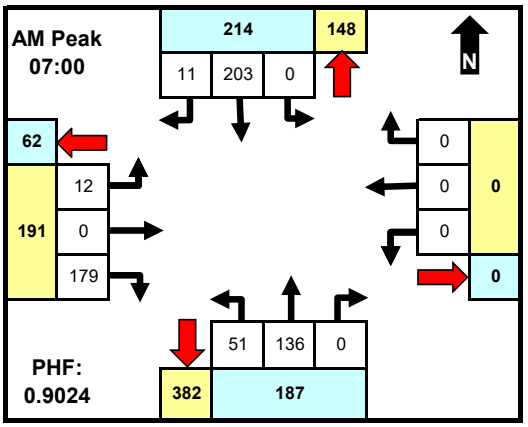
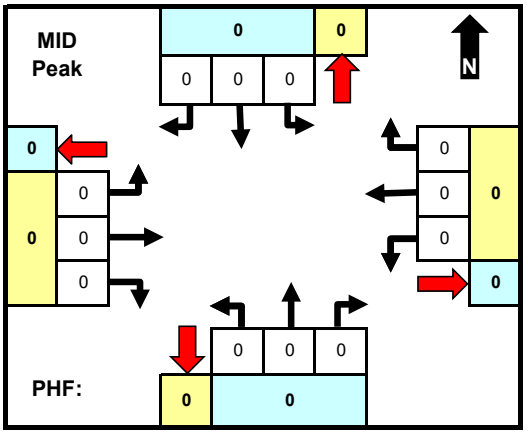
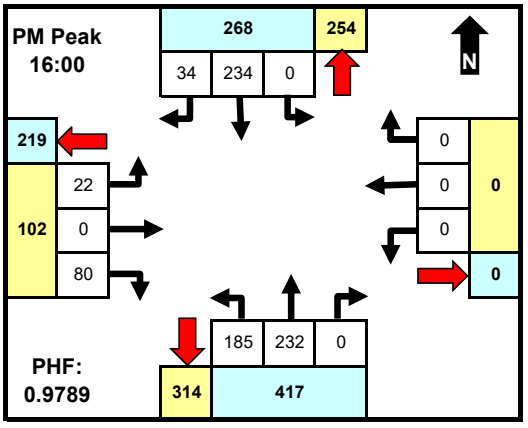
Intersection TMC: 1602339
Count Date: 3/23/2016



From North					From East				From South				From West				INTSEC
AZ 89					BIG CHINO RD				AZ 89				BIG CHINO RD				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	0	67	0	0	0	0	0	0	11	31	0	0	1	0	54	0	164
7:15	0	44	5	0	0	0	0	0	13	42	0	0	4	0	48	0	156
7:30	0	40	2	0	0	0	0	0	16	38	0	0	2	0	34	0	132
7:45	0	52	4	0	0	0	0	0	11	25	0	0	5	0	43	0	140
8:00	0	39	1	0	0	0	0	0	8	40	0	0	2	0	38	0	128
8:15	0	31	2	0	0	0	0	0	12	36	0	0	1	0	23	0	105
8:30	0	46	4	0	0	0	0	0	10	26	0	0	0	0	19	0	105
8:45	0	41	2	0	0	0	0	0	14	32	0	0	5	0	22	0	116
Total	0	360	20	0	0	0	0	0	95	270	0	0	20	0	281	0	1046
Pk Hr																	7:00 AM
Pk Vol	0	203	11	0	0	0	0	0	51	136	0	0	12	0	179	0	592
PHF	0.000	0.757	0.550	0.000	0.000	0.000	0.000	0.000	0.797	0.810	0.000	0.000	0.600	0.000	0.829	0.000	0.902



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	0	67	8	0	0	0	0	0	41	59	0	0	4	0	20	0	199
16:15	0	57	11	0	0	0	0	0	50	63	0	0	5	0	15	0	201
16:30	0	58	9	0	0	0	0	0	54	48	0	0	8	0	24	0	201
16:45	0	52	6	0	0	0	0	0	40	62	0	0	5	0	21	0	186
17:00	0	46	5	0	0	0	0	0	58	64	0	0	0	0	15	0	188
17:15	0	46	4	0	0	0	0	0	44	65	0	0	8	0	15	0	182
17:30	0	54	4	0	0	0	0	0	45	50	0	0	4	0	15	0	172
17:45	0	34	4	0	0	0	0	0	51	61	0	0	5	0	12	0	167
Total	0	414	51	0	0	0	0	0	383	472	0	0	39	0	137	0	1496
Pk Hr																	4:00 PM
Pk Vol	0	234	34	0	0	0	0	0	185	232	0	0	22	0	80	0	787
PHF	0.000	0.873	0.773	0.000	0.000	0.000	0.000	0.000	0.856	0.921	0.000	0.000	0.688	0.000	0.833	0.000	0.979

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:00 AM	592	7:00 AM	164	0.902
MID					
PM	4:00 PM	787	4:15 PM	201	0.979

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	7:00 AM	214	0.799				7:15 AM	193	0.877	7:00 AM	191	0.868
MID												
PM	4:00 PM	268	0.893				4:15 PM	439	0.900	4:00 PM	102	0.797

Comments

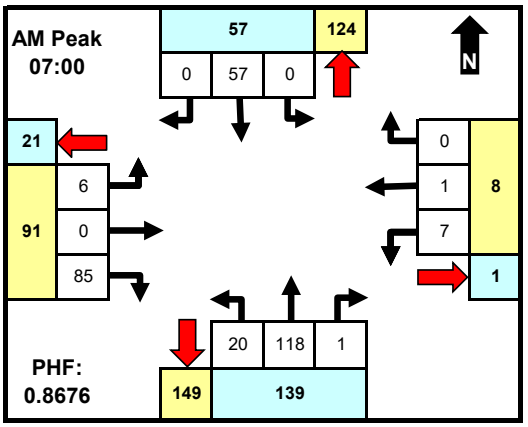
Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	380	290	0	0	365	641	301	115
MID	0	0	0	0	0	0	0	0
PM	465	511	0	0	855	551	176	434

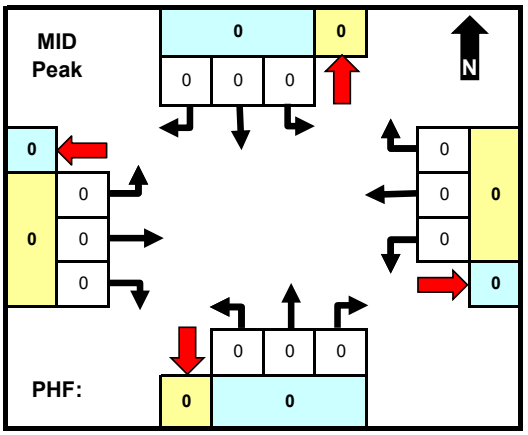
TRAFFIC RESEARCH & ANALYSIS, INC.
Specializing in Traffic Data Collection

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

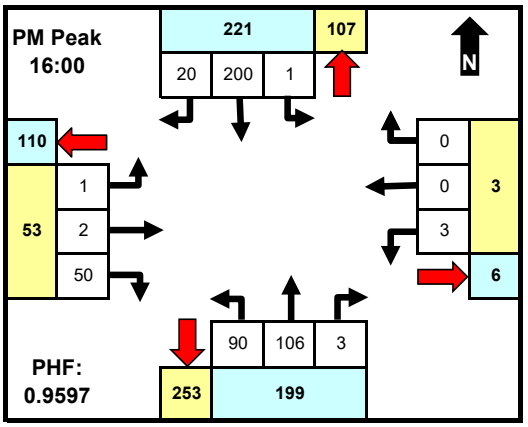
Intersection TMC: 1602340
Count Date: 3/23/2016



	From North				From East				From South				From West				INTSEC
	AZ 89				BRAMBLE DR				AZ 89				BRAMBLE DR				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	0	16	0	0	2	1	0	0	4	32	0	0	2	0	28	0	85
7:15	0	11	0	0	1	0	0	0	8	36	0	0	0	0	19	0	75
7:30	0	6	0	0	1	0	0	0	5	28	0	0	4	0	20	0	64
7:45	0	24	0	0	3	0	0	0	3	22	1	0	0	0	18	0	71
8:00	0	16	1	0	1	0	0	0	2	32	2	0	0	0	9	0	63
8:15	0	23	0	0	0	0	0	0	5	25	0	0	1	0	9	0	63
8:30	0	30	0	0	0	0	0	0	2	26	0	0	0	0	14	0	72
8:45	0	25	0	0	0	0	0	0	3	26	0	0	0	0	7	0	61
Total	0	151	1	0	8	1	0	0	32	227	3	0	7	0	124	0	554
Pk Hr																	7:00 AM
Pk Vol	0	57	0	0	7	1	0	0	20	118	1	0	6	0	85	0	295
PHF	0.000	0.594	0.000	0.000	0.583	0.250	0.000	0.000	0.625	0.819	0.250	0.000	0.375	0.000	0.759	0.000	0.868



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	0	60	5	0	1	0	0	0	20	21	1	0	0	0	12	0	120
16:15	0	43	7	0	1	0	0	0	19	37	2	0	0	0	15	0	124
16:30	1	50	6	0	0	0	0	0	21	22	0	0	1	0	14	0	115
16:45	0	47	2	0	1	0	0	0	30	26	0	0	0	2	9	0	117
17:00	0	41	0	0	1	0	0	0	21	27	3	0	2	0	8	0	103
17:15	0	39	2	0	1	0	0	0	25	32	1	0	0	0	9	0	109
17:30	0	33	2	0	1	0	0	0	21	16	2	0	0	0	10	0	85
17:45	0	24	1	0	0	0	0	0	27	23	0	0	0	0	9	0	84
Total	1	337	25	0	6	0	0	0	184	204	9	0	3	2	86	0	857
Pk Hr																	4:00 PM
Pk Vol	1	200	20	0	3	0	0	0	90	106	3	0	1	2	50	0	476
PHF	0.250	0.833	0.714	0.000	0.750	0.000	0.000	0.000	0.750	0.716	0.375	0.000	0.250	0.250	0.833	0.000	0.960

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:00 AM	295	7:00 AM	85	0.868
MID					
PM	4:00 PM	476	4:15 PM	124	0.960

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	8:00 AM	95	0.792	7:00 AM	8	0.667	7:00 AM	139	0.790	7:00 AM	91	0.758
MID												
PM	4:00 PM	221	0.850	4:45 PM	4	1.000	4:15 PM	208	0.897	4:00 PM	53	0.883

Comments

Approach & Departure Volumes (No Peds)

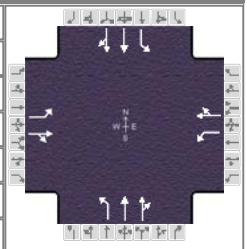
Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	152	234	9	3	262	283	131	34
MID	0	0	0	0	0	0	0	0
PM	363	207	6	12	397	429	91	209

APPENDIX WP1-4

2016 HCS and SIDRA Results

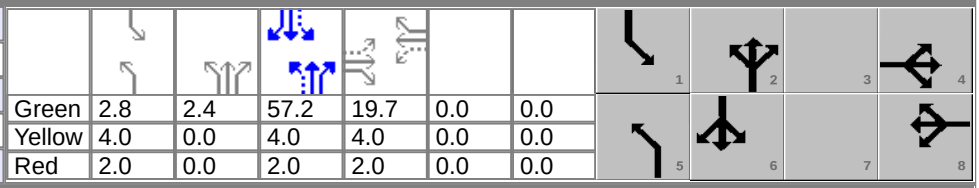
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_AM_Existing Conditions.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	55	50	145	45	45	30	65	235	30	20	475	70

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	2.4	57.2	19.7	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0

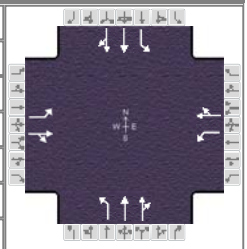
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		25.7		25.7	11.2	65.6	8.8	63.2
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		14.2		18.3	3.6		2.5	
Green Extension Time (g_e), s		1.5		1.4	0.2	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.87		0.46	
Max Out Probability		0.01		0.03	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	61	217		50	83		72	149	146	22	309	297
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1309	1643		1160	1738		1774	1810	1738	1774	1810	1728
Queue Service Time (g_s), s	4.1	12.2		4.2	4.0		1.6	3.6	3.7	0.5	8.8	8.9
Cycle Queue Clearance Time (g_c), s	8.1	12.2		16.3	4.0		1.6	3.6	3.7	0.5	8.8	8.9
Green Ratio (*g/C*)	0.20	0.20		0.20	0.20		0.62	0.60	0.60	0.60	0.57	0.57
Capacity (*c*), veh/h	278	323		160	342		554	1078	1035	702	1034	987
Volume-to-Capacity Ratio (*X*)	0.220	0.670		0.312	0.244		0.130	0.138	0.141	0.032	0.299	0.301
Back of Queue (*Q*), ft/ln (50 th percentile)	34.5	128		31.8	43.9		13.6	33.5	32.6	4.4	84	80.2
Back of Queue (*Q*), veh/ln (50 th percentile)	1.4	5.1		1.3	1.8		0.5	1.3	1.3	0.2	3.3	3.2
Queue Storage Ratio (*RQ*) (50 th percentile)	0.28	0.00		0.32	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	37.2	37.2		44.6	33.9		7.8	8.9	8.9	8.2	11.1	11.1
Incremental Delay (d_2), s/veh	0.4	2.4		1.1	0.4		0.1	0.3	0.3	0.0	0.7	0.8
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	37.6	39.6		45.7	34.3		8.0	9.2	9.2	8.2	11.8	11.9
Level of Service (LOS)	D	D		D	C		A	A	A	A	B	B
Approach Delay, s/veh / LOS	39.1	D		38.6	D		8.9	A		11.7	B	
Intersection Delay, s/veh / LOS	19.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.2	B
Bicycle LOS Score / LOS	0.9	A	0.7	A	0.8	A	1.0	A

HCS 2010 Signalized Intersection Results Summary

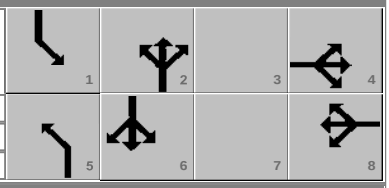
General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_PM_Existing Conditions.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	45	95	30	25	10	190	530	45	20	430	25

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	2.8	4.2	60.7	14.3	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		20.3		20.3	13.0	70.9	8.8	66.7
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		10.9		13.4	6.3		2.5	
Green Extension Time (g_e), s		1.0		0.9	0.7	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.46	
Max Out Probability		0.01		0.04	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	78	156		33	39		211	323	315	22	255	251
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1363	1660		1226	1772		1774	1810	1759	1774	1810	1774
Queue Service Time (g_s), s	5.3	8.9		2.6	1.9		4.3	7.6	7.7	0.5	6.4	6.5
Cycle Queue Clearance Time (g_c), s	7.2	8.9		11.4	1.9		4.3	7.6	7.7	0.5	6.4	6.5
Green Ratio (*g/C*)	0.14	0.14		0.14	0.14		0.68	0.65	0.65	0.63	0.61	0.61
Capacity (*c*), veh/h	242	238		140	254		678	1174	1141	555	1097	1076
Volume-to-Capacity Ratio (*X*)	0.321	0.653		0.238	0.153		0.312	0.275	0.276	0.040	0.232	0.233
Back of Queue (*Q*), ft/ln (50 th percentile)	46.7	95.6		21.4	21.5		33.6	66.9	64.4	3.9	59.4	57.6
Back of Queue (*Q*), veh/ln (50 th percentile)	1.8	3.8		0.8	0.9		1.3	2.6	2.6	0.2	2.3	2.3
Queue Storage Ratio (*RQ*) (50 th percentile)	0.37	0.00		0.21	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	40.6	40.5		45.8	37.5		6.2	7.5	7.5	6.9	9.0	9.0
Incremental Delay (d_2), s/veh	0.8	3.0		0.9	0.3		0.3	0.6	0.6	0.0	0.5	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	41.4	43.5		46.7	37.8		6.4	8.1	8.1	7.0	9.5	9.5
Level of Service (LOS)	D	D		D	D		A	A	A	A	A	A
Approach Delay, s/veh / LOS	42.8	D		41.9	D		7.7	A		9.4	A	
Intersection Delay, s/veh / LOS	14.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	2.2	B	2.2	B
Bicycle LOS Score / LOS	0.9	A	0.6	A	1.2	A	0.9	A

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N Existing Conditions - AM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	22	3.0	0.159	4.9	LOS A	0.6	15.5	0.15	0.87	27.5
8	T	294	5.0	0.159	5.0	LOS A	0.6	15.5	0.15	0.42	30.9
18	R	11	3.0	0.159	5.0	LOS A	0.6	15.5	0.15	0.55	30.1
Approach		328	4.8	0.159	5.0	LOS A	0.6	15.5	0.15	0.46	30.6
East: Rd 4N											
1	L	28	3.0	0.065	4.8	LOS A	0.2	4.1	0.30	0.79	27.5
6	T	6	3.0	0.065	4.8	LOS A	0.2	4.1	0.30	0.50	30.7
16	R	22	3.0	0.065	4.8	LOS A	0.2	4.1	0.30	0.57	30.2
Approach		56	3.0	0.065	4.8	LOS A	0.2	4.1	0.30	0.68	28.8
North: SR 89											
7	L	11	3.0	0.284	6.4	LOS A	1.2	31.7	0.19	0.89	26.8
4	T	539	5.0	0.284	6.4	LOS A	1.2	31.7	0.19	0.44	30.0
14	R	28	3.0	0.284	6.4	LOS A	1.2	31.7	0.19	0.55	29.3
Approach		578	4.9	0.284	6.4	LOS A	1.2	31.7	0.19	0.45	29.9
West: Rd 4N											
5	L	22	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.84	27.1
2	T	11	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.60	30.0
12	R	44	3.0	0.062	5.7	LOS A	0.2	3.9	0.40	0.68	29.6
Approach		78	3.0	0.062	5.7	LOS A	0.2	3.9	0.40	0.71	28.8
All Vehicles		1039	4.6	0.284	5.8	LOS A	1.2	31.7	0.20	0.48	29.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N Existing Conditions - PM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	44	3.0	0.329	6.8	LOS A	1.5	39.2	0.17	0.87	26.6
8	T	592	5.0	0.329	6.8	LOS A	1.5	39.2	0.17	0.42	29.7
18	R	44	3.0	0.329	6.8	LOS A	1.5	39.2	0.17	0.54	28.9
Approach		681	4.7	0.329	6.8	LOS A	1.5	39.2	0.17	0.46	29.4
East: Rd 4N											
1	L	17	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.88	27.0
6	T	6	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.63	29.8
16	R	22	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.69	29.4
Approach		44	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.75	28.5
North: SR 89											
7	L	11	3.0	0.221	5.7	LOS A	0.9	22.9	0.20	0.88	27.2
4	T	417	5.0	0.221	5.7	LOS A	0.9	22.9	0.20	0.44	30.4
14	R	17	3.0	0.221	5.7	LOS A	0.9	22.9	0.20	0.56	29.7
Approach		444	4.9	0.221	5.7	LOS A	0.9	22.9	0.20	0.46	30.3
West: Rd 4N											
5	L	17	3.0	0.036	5.0	LOS A	0.1	2.4	0.36	0.81	27.4
2	T	11	3.0	0.036	5.0	LOS A	0.1	2.4	0.36	0.54	30.5
12	R	33	3.0	0.042	5.0	LOS A	0.1	2.6	0.34	0.62	30.0
Approach		61	3.0	0.042	5.0	LOS A	0.1	2.6	0.35	0.66	29.3
All Vehicles		1231	4.6	0.329	6.3	LOS A	1.5	39.2	0.20	0.48	29.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

HCS 2010 Two-Way Stop Control Summary Report

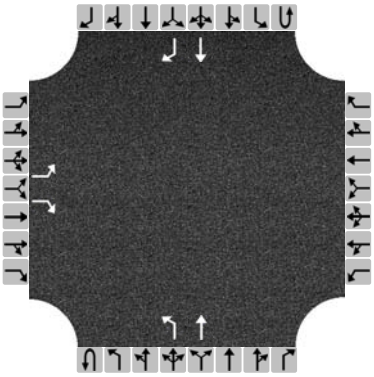
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		5		45						25	180				390	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6		53						29						
Capacity		378		600						1084						
v/c Ratio		0.02		0.09						0.03						
95% Queue Length		0.0		0.3						0.1						
Control Delay (s/veh)		14.7		11.6						8.4						
Level of Service (LOS)		B		B						A						
Approach Delay (s/veh)	11.9								1.0							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

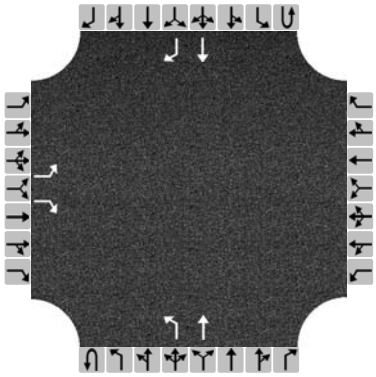
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		25						25	425				290	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		28						28						
Capacity		322		716						1219						
v/c Ratio		0.03		0.04						0.02						
95% Queue Length		0.1		0.1						0.1						
Control Delay (s/veh)		16.6		10.2						8.0						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	12.0								0.4							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

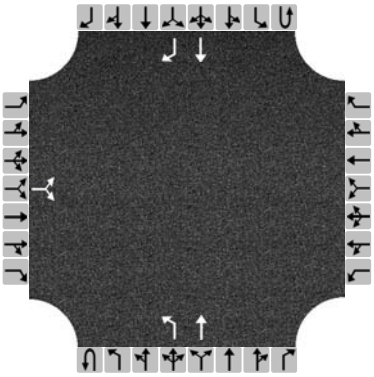
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Big Chino Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Big Chino Rd
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		10		180						50	135				205	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized		No				No				No				No		
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			224							59						
Capacity			770							1305						
v/c Ratio			0.29							0.05						
95% Queue Length			1.2							0.1						
Control Delay (s/veh)			11.6							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	11.6								2.1							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

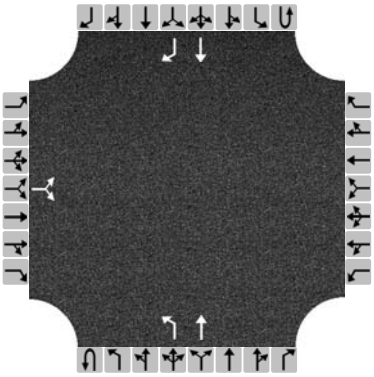
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Big Chino Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Big Chino Rd
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		20		80						185	230				235	35
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized		No				No				No				No		
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			111							206						
Capacity			544							1254						
v/c Ratio			0.20							0.16						
95% Queue Length			0.8							0.6						
Control Delay (s/veh)			13.3							8.4						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.3								3.8							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

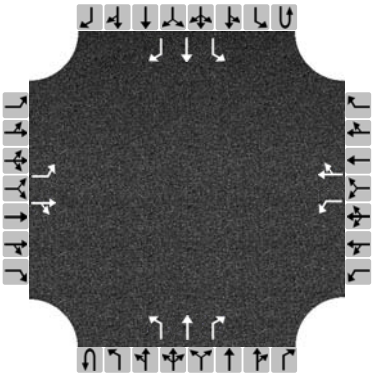
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		5	0	85		10	5	0		20	120	5		0	55	0
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6		100		12		6		24						
Capacity		680		996		574		637		1529				1427		
v/c Ratio		0.01		0.10		0.02		0.01		0.02						
95% Queue Length		0.0		0.3		0.1		0.0		0.0						
Control Delay (s/veh)		10.3		9.0		11.4		10.7		7.4				7.5		
Level of Service (LOS)		B		A		B		B		A				A		
Approach Delay (s/veh)	9.1				11.2				1.0							
Approach LOS	A				B											

HCS 2010 Two-Way Stop Control Summary Report

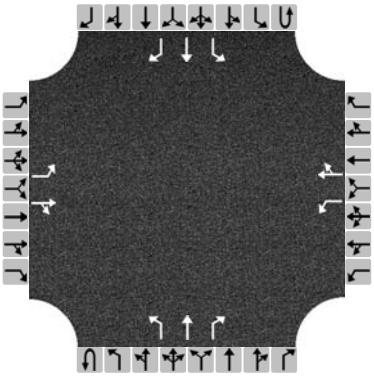
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/6/2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		5	5	50		5	0	0		90	105	5		5	200	20
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

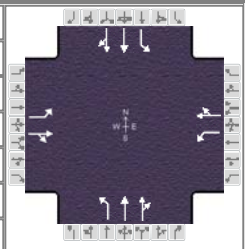
Flow Rate (veh/h)		6		62		6				100				6		
Capacity		416		742		365				1315				1456		
v/c Ratio		0.01		0.08		0.02				0.08				0.00		
95% Queue Length		0.0		0.3		0.1				0.2				0.0		
Control Delay (s/veh)		13.8		10.3		15.0				8.0				7.5		
Level of Service (LOS)		B		B		C				A				A		
Approach Delay (s/veh)	10.6				15.0				3.6				0.2			
Approach LOS	B				C											

APPENDIX WP1-5

2021 HCS and SIDRA Results

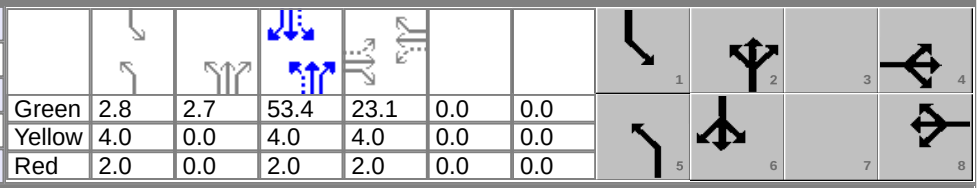
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_AM_5 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	60	60	180	50	50	40	80	290	40	20	580	80

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	2.7	53.4	23.1	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0

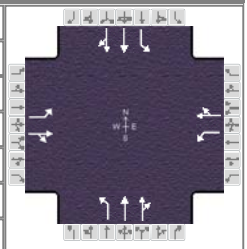
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		29.1		29.1	11.5	62.1	8.8	59.4
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.5		4.5	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		16.9		21.7	4.2		2.6	
Green Extension Time (g_e), s		1.8		1.5	0.2	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.92		0.46	
Max Out Probability		0.03		0.18	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	67	267		56	100		89	186	181	22	374	359
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1290	1641		1108	1725		1774	1810	1733	1774	1810	1732
Queue Service Time (g_s), s	4.4	14.9		4.8	4.7		2.2	5.0	5.1	0.6	12.1	12.2
Cycle Queue Clearance Time (g_c), s	9.1	14.9		19.7	4.7		2.2	5.0	5.1	0.6	12.1	12.2
Green Ratio (*g/C*)	0.23	0.23		0.23	0.23		0.59	0.56	0.56	0.56	0.53	0.53
Capacity (*c*), veh/h	310	379		164	399		465	1016	973	616	966	925
Volume-to-Capacity Ratio (*X*)	0.215	0.703		0.339	0.251		0.191	0.183	0.186	0.036	0.387	0.388
Back of Queue (*Q*), ft/ln (50 th percentile)	36.5	156.1		35.3	50.5		19.3	48.2	46.4	5	120.5	114.4
Back of Queue (*Q*), veh/ln (50 th percentile)	1.4	6.2		1.4	2.0		0.8	1.9	1.9	0.2	4.7	4.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.29	0.00		0.35	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	35.1	35.3		44.3	31.4		9.8	10.7	10.7	9.8	13.7	13.7
Incremental Delay (d_2), s/veh	0.3	2.8		1.2	0.3		0.2	0.4	0.4	0.0	1.2	1.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	35.4	38.1		45.5	31.7		10.0	11.1	11.2	9.9	14.9	14.9
Level of Service (LOS)	D	D		D	C		A	B	B	A	B	B
Approach Delay, s/veh / LOS	37.6	D		36.6	D		10.9	B		14.7	B	
Intersection Delay, s/veh / LOS	20.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.7	A	0.9	A	1.1	A

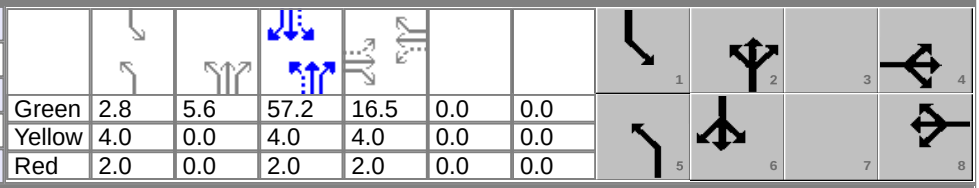
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_PM_5 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	80	50	110	40	30	10	230	650	50	20	530	30

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	5.6	57.2	16.5	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		22.5		22.5	14.4	68.8	8.8	63.2
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		12.0		15.6	7.5		2.5	
Green Extension Time (g_e), s		1.1		0.9	0.8	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.46	
Max Out Probability		0.03		0.15	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	89	178		44	44		256	394	384	22	314	309
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1356	1658		1202	1783		1774	1810	1764	1774	1810	1775
Queue Service Time (g_s), s	6.0	10.0		3.6	2.1		5.5	10.4	10.4	0.5	9.0	9.0
Cycle Queue Clearance Time (g_c), s	8.1	10.0		13.6	2.1		5.5	10.4	10.4	0.5	9.0	9.0
Green Ratio (*g/C*)	0.16	0.16		0.16	0.16		0.67	0.63	0.63	0.60	0.57	0.57
Capacity (*c*), veh/h	268	274		151	294		604	1135	1106	468	1034	1014
Volume-to-Capacity Ratio (*X*)	0.332	0.650		0.295	0.151		0.423	0.347	0.347	0.047	0.303	0.304
Back of Queue (*Q*), ft/ln (50 th percentile)	52.3	107.2		28.5	23.9		44	93.4	90.1	4.4	86.1	83.4
Back of Queue (*Q*), veh/ln (50 th percentile)	2.1	4.3		1.1	1.0		1.7	3.7	3.6	0.2	3.4	3.3
Queue Storage Ratio (*RQ*) (50 th percentile)	0.42	0.00		0.28	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	39.2	39.0		45.4	35.8		7.2	8.9	8.9	8.4	11.1	11.1
Incremental Delay (d_2), s/veh	0.7	2.6		1.1	0.2		0.5	0.8	0.9	0.0	0.8	0.8
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	39.9	41.6		46.4	36.0		7.6	9.7	9.7	8.4	11.9	11.9
Level of Service (LOS)	D	D		D	D		A	A	A	A	B	B
Approach Delay, s/veh / LOS	41.1	D		41.2	D		9.2	A		11.8	B	
Intersection Delay, s/veh / LOS	15.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.2	B
Bicycle LOS Score / LOS	0.9	A	0.6	A	1.3	A	1.0	A

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 5 Year Horizon - AM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	22	3.0	0.189	5.2	LOS A	0.7	19.0	0.15	0.88	27.3
8	T	356	5.0	0.189	5.3	LOS A	0.7	19.0	0.15	0.42	30.7
18	R	11	3.0	0.189	5.3	LOS A	0.7	19.0	0.15	0.55	29.9
Approach		389	4.8	0.189	5.3	LOS A	0.7	19.0	0.15	0.45	30.4
East: Rd 4N											
1	L	33	3.0	0.081	5.2	LOS A	0.2	5.2	0.34	0.82	27.3
6	T	11	3.0	0.081	5.2	LOS A	0.2	5.2	0.34	0.54	30.4
16	R	22	3.0	0.081	5.2	LOS A	0.2	5.2	0.34	0.60	29.9
Approach		67	3.0	0.081	5.2	LOS A	0.2	5.2	0.34	0.70	28.6
North: SR 89											
7	L	11	3.0	0.348	7.2	LOS A	1.6	41.9	0.23	0.88	26.5
4	T	656	5.0	0.348	7.2	LOS A	1.6	41.9	0.23	0.45	29.4
14	R	33	3.0	0.348	7.2	LOS A	1.6	41.9	0.23	0.56	28.7
Approach		700	4.9	0.348	7.2	LOS A	1.6	41.9	0.23	0.46	29.3
West: Rd 4N											
5	L	22	3.0	0.053	6.3	LOS A	0.1	3.5	0.45	0.87	26.8
2	T	11	3.0	0.053	6.3	LOS A	0.1	3.5	0.45	0.65	29.6
12	R	56	3.0	0.085	6.4	LOS A	0.2	5.4	0.44	0.73	29.1
Approach		89	3.0	0.085	6.4	LOS A	0.2	5.4	0.44	0.76	28.5
All Vehicles		1244	4.6	0.348	6.4	LOS A	1.6	41.9	0.23	0.49	29.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 5 Year Horizon - PM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	56	3.0	0.404	7.9	LOS A	2.1	53.3	0.20	0.85	26.1
8	T	722	5.0	0.404	7.9	LOS A	2.1	53.3	0.20	0.43	29.0
18	R	56	3.0	0.404	7.9	LOS A	2.1	53.3	0.20	0.54	28.3
Approach		833	4.7	0.404	7.9	LOS A	2.1	53.3	0.20	0.46	28.7
East: Rd 4N											
1	L	22	3.0	0.109	7.2	LOS A	0.3	7.1	0.47	0.91	26.5
6	T	11	3.0	0.109	7.2	LOS A	0.3	7.1	0.47	0.68	29.1
16	R	33	3.0	0.109	7.2	LOS A	0.3	7.1	0.47	0.73	28.7
Approach		67	3.0	0.109	7.2	LOS A	0.3	7.1	0.47	0.78	27.9
North: SR 89											
7	L	11	3.0	0.277	6.4	LOS A	1.2	30.3	0.25	0.88	26.8
4	T	511	5.0	0.277	6.4	LOS A	1.2	30.3	0.25	0.46	29.9
14	R	22	3.0	0.277	6.4	LOS A	1.2	30.3	0.25	0.57	29.2
Approach		544	4.9	0.277	6.4	LOS A	1.2	30.3	0.25	0.47	29.8
West: Rd 4N											
5	L	22	3.0	0.047	5.5	LOS A	0.1	3.1	0.40	0.83	27.2
2	T	11	3.0	0.047	5.5	LOS A	0.1	3.1	0.40	0.58	30.1
12	R	44	3.0	0.060	5.5	LOS A	0.1	3.8	0.38	0.67	29.7
Approach		78	3.0	0.060	5.5	LOS A	0.1	3.8	0.39	0.70	28.9
All Vehicles		1522	4.6	0.404	7.2	LOS A	2.1	53.3	0.24	0.49	29.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

HCS 2010 Two-Way Stop Control Summary Report

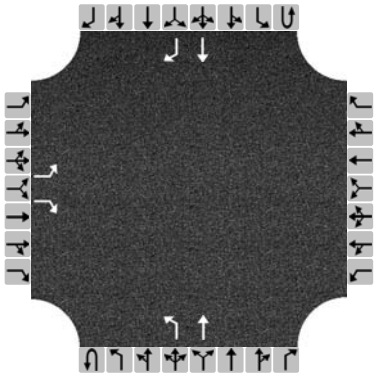
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2021
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		50						30	210				470	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		59						35						
Capacity		309		530						1001						
v/c Ratio		0.04		0.11						0.03						
95% Queue Length		0.1		0.4						0.1						
Control Delay (s/veh)		17.1		12.6						8.7						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	13.4								1.1							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

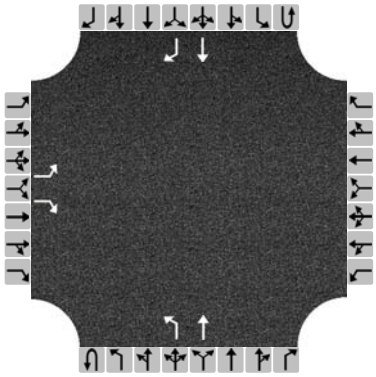
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2021
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		30						30	510				350	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		33						33						
Capacity		253		657						1152						
v/c Ratio		0.04		0.05						0.03						
95% Queue Length		0.1		0.2						0.1						
Control Delay (s/veh)		19.9		10.8						8.2						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	13.1								0.5							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

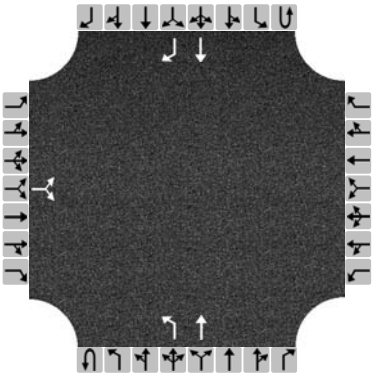
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2021
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Big Chino Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Big Chino Rd
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		20		220						60	160				240	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

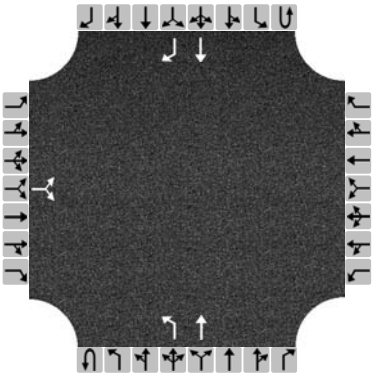
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			283							71						
Capacity			709							1260						
v/c Ratio			0.40							0.06						
95% Queue Length			1.9							0.2						
Control Delay (s/veh)			13.4							8.0						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.4								2.2							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Big Chino Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Big Chino Rd
Analysis Year	2021	North/South Street	SR 89
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		30		100						220	280				280	40
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			144							244						
Capacity			433							1197						
v/c Ratio			0.33							0.20						
95% Queue Length			1.4							0.8						
Control Delay (s/veh)			17.4							8.8						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	17.4								3.9							
Approach LOS	C															

HCS 2010 Two-Way Stop Control Summary Report

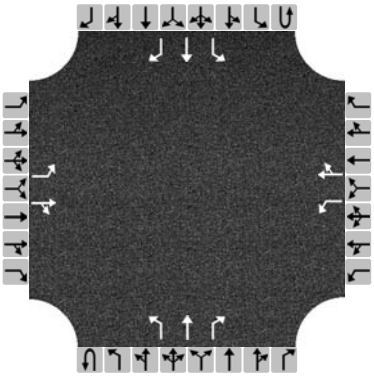
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2021
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	0	100		10	10	0		20	140	10		0	70	0
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		118		12		12		24						
Capacity		631		974		520		605		1507				1391		
v/c Ratio		0.02		0.12		0.02		0.02		0.02						
95% Queue Length		0.1		0.4		0.1		0.1		0.0						
Control Delay (s/veh)		10.8		9.2		12.1		11.1		7.4				7.6		
Level of Service (LOS)		B		A		B		B		A				A		
Approach Delay (s/veh)	9.4				11.6				0.9							
Approach LOS	A				B											

HCS 2010 Two-Way Stop Control Summary Report

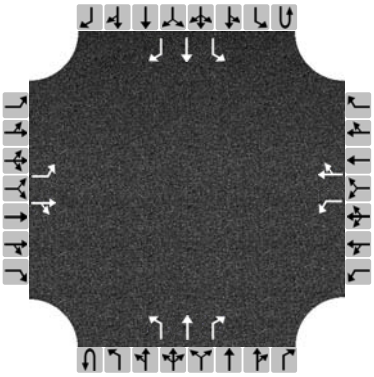
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2021
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	10	60		10	0	0		110	130	10		10	250	20
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

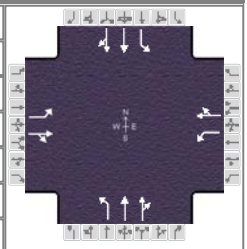
Flow Rate (veh/h)		11		78		11				122				11		
Capacity		330		640		276				1254				1417		
v/c Ratio		0.03		0.12		0.04				0.10				0.01		
95% Queue Length		0.1		0.4		0.1				0.3				0.0		
Control Delay (s/veh)		16.3		11.4		18.6				8.2				7.6		
Level of Service (LOS)		C		B		C				A				A		
Approach Delay (s/veh)	12.0				18.6				3.6				0.3			
Approach LOS	B				C											

APPENDIX WP1-6

2026 HCS and SIDRA Results

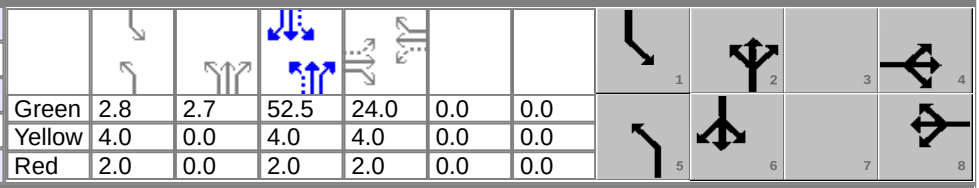
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_AM_10 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	60	180	60	60	40	80	310	40	20	610	90

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	2.7	52.5	24.0	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0

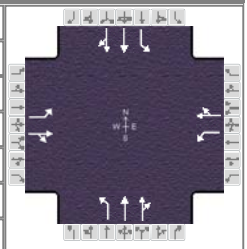
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.0		30.0	11.5	61.3	8.8	58.5
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.5		4.5	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		16.8		22.5	4.2		2.6	
Green Extension Time (g_e), s		1.9		1.5	0.2	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.92		0.46	
Max Out Probability		0.04		0.26	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	78	267		67	111		89	197	192	22	398	380
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1277	1641		1108	1738		1774	1810	1737	1774	1810	1728
Queue Service Time (g_s), s	5.3	14.8		5.8	5.2		2.2	5.5	5.6	0.6	13.4	13.4
Cycle Queue Clearance Time (g_c), s	10.4	14.8		20.5	5.2		2.2	5.5	5.6	0.6	13.4	13.4
Green Ratio (*g/C*)	0.24	0.24		0.24	0.24		0.58	0.55	0.55	0.55	0.53	0.53
Capacity (*c*), veh/h	312	393		175	416		439	1000	960	593	951	908
Volume-to-Capacity Ratio (*X*)	0.249	0.678		0.381	0.267		0.202	0.197	0.200	0.037	0.418	0.419
Back of Queue (*Q*), ft/ln (50 th percentile)	42.7	153.6		42.3	55.8		19.9	53	51	5.2	133.3	126.2
Back of Queue (*Q*), veh/ln (50 th percentile)	1.7	6.1		1.7	2.2		0.8	2.1	2.0	0.2	5.2	5.0
Queue Storage Ratio (*RQ*) (50 th percentile)	0.34	0.00		0.42	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	35.1	34.5		43.8	30.9		10.3	11.2	11.2	10.2	14.4	14.4
Incremental Delay (d_2), s/veh	0.4	2.4		1.4	0.3		0.2	0.4	0.5	0.0	1.4	1.4
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	35.5	36.9		45.1	31.2		10.5	11.7	11.7	10.3	15.8	15.9
Level of Service (LOS)	D	D		D	C		B	B	B	B	B	B
Approach Delay, s/veh / LOS	36.6	D		36.4	D		11.5	B		15.7	B	
Intersection Delay, s/veh / LOS	20.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.3	B
Bicycle LOS Score / LOS	1.1	A	0.8	A	0.9	A	1.1	A

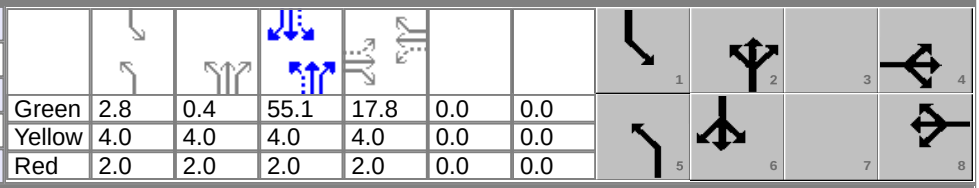
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_PM_10 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	90	60	120	40	30	10	250	690	60	20	560	30

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	0.4	55.1	17.8	0.0	0.0
Yellow	4.0	4.0	4.0	4.0	0.0	0.0
Red	2.0	2.0	2.0	2.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		23.8		23.8	15.2	67.5	8.8	61.1
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		13.2		16.8	8.3		2.5	
Green Extension Time (g_e), s		1.2		0.9	0.9	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.46	
Max Out Probability		0.06		0.30	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	100	200		44	44		278	423	411	22	330	325
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1356	1663		1178	1783		1774	1810	1758	1774	1810	1777
Queue Service Time (g_s), s	6.7	11.2		3.7	2.1		6.3	11.7	11.8	0.5	10.0	10.1
Cycle Queue Clearance Time (g_c), s	8.8	11.2		14.8	2.1		6.3	11.7	11.8	0.5	10.0	10.1
Green Ratio (*g/C*)	0.18	0.18		0.18	0.18		0.66	0.61	0.61	0.58	0.55	0.55
Capacity (*c*), veh/h	285	296		150	317		582	1112	1081	433	996	978
Volume-to-Capacity Ratio (*X*)	0.350	0.676		0.297	0.140		0.477	0.380	0.380	0.051	0.332	0.332
Back of Queue (*Q*), ft/ln (50 th percentile)	58.3	120.3		28.4	23.4		50.9	107.6	103.5	4.8	97.7	95.2
Back of Queue (*Q*), veh/ln (50 th percentile)	2.3	4.8		1.1	0.9		2.0	4.2	4.1	0.2	3.8	3.8
Queue Storage Ratio (*RQ*) (50 th percentile)	0.47	0.00		0.28	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	38.3	38.4		45.3	34.7		7.9	9.7	9.7	9.3	12.4	12.4
Incremental Delay (d_2), s/veh	0.7	2.7		1.1	0.2		0.6	1.0	1.0	0.0	0.9	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	39.1	41.1		46.4	34.9		8.5	10.7	10.7	9.3	13.3	13.3
Level of Service (LOS)	D	D		D	C		A	B	B	A	B	B
Approach Delay, s/veh / LOS	40.4	D		40.6	D		10.2	B		13.1	B	
Intersection Delay, s/veh / LOS	16.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.2	B
Bicycle LOS Score / LOS	1.0	A	0.6	A	1.4	A	1.0	A

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 10 Year Horizon - AM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	22	3.0	0.200	5.4	LOS A	0.8	20.3	0.16	0.88	27.3
8	T	378	5.0	0.200	5.4	LOS A	0.8	20.3	0.16	0.42	30.6
18	R	11	3.0	0.200	5.4	LOS A	0.8	20.3	0.16	0.55	29.9
Approach		411	4.8	0.200	5.4	LOS A	0.8	20.3	0.16	0.45	30.4
East: Rd 4N											
1	L	33	3.0	0.083	5.3	LOS A	0.2	5.3	0.35	0.83	27.3
6	T	11	3.0	0.083	5.3	LOS A	0.2	5.3	0.35	0.55	30.3
16	R	22	3.0	0.083	5.3	LOS A	0.2	5.3	0.35	0.61	29.8
Approach		67	3.0	0.083	5.3	LOS A	0.2	5.3	0.35	0.71	28.5
North: SR 89											
7	L	11	3.0	0.370	7.5	LOS A	1.8	45.8	0.24	0.88	26.3
4	T	700	5.0	0.370	7.5	LOS A	1.8	45.9	0.24	0.45	29.2
14	R	33	3.0	0.370	7.5	LOS A	1.8	45.9	0.24	0.56	28.6
Approach		744	4.9	0.370	7.5	LOS A	1.8	45.9	0.24	0.46	29.1
West: Rd 4N											
5	L	22	3.0	0.055	6.5	LOS A	0.1	3.6	0.47	0.89	26.7
2	T	11	3.0	0.055	6.5	LOS A	0.1	3.6	0.47	0.66	29.4
12	R	56	3.0	0.087	6.6	LOS A	0.2	5.6	0.45	0.74	28.9
Approach		89	3.0	0.087	6.6	LOS A	0.2	5.6	0.46	0.77	28.4
All Vehicles		1311	4.6	0.370	6.7	LOS A	1.8	45.9	0.23	0.49	29.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 10 Year Horizon - PM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	56	3.0	0.426	8.2	LOS A	2.2	58.0	0.21	0.85	26.0
8	T	767	5.0	0.426	8.2	LOS A	2.2	58.0	0.21	0.43	28.8
18	R	56	3.0	0.426	8.2	LOS A	2.2	58.0	0.21	0.54	28.1
Approach		878	4.7	0.426	8.2	LOS A	2.2	58.0	0.21	0.46	28.5
East: Rd 4N											
1	L	22	3.0	0.113	7.4	LOS A	0.3	7.3	0.49	0.92	26.4
6	T	11	3.0	0.113	7.4	LOS A	0.3	7.3	0.49	0.69	28.9
16	R	33	3.0	0.113	7.4	LOS A	0.3	7.3	0.49	0.74	28.5
Approach		67	3.0	0.113	7.4	LOS A	0.3	7.3	0.49	0.79	27.8
North: SR 89											
7	L	11	3.0	0.294	6.6	LOS A	1.3	32.8	0.25	0.88	26.8
4	T	544	5.0	0.294	6.6	LOS A	1.3	32.8	0.25	0.46	29.8
14	R	22	3.0	0.294	6.6	LOS A	1.3	32.8	0.25	0.57	29.1
Approach		578	4.9	0.294	6.6	LOS A	1.3	32.8	0.25	0.47	29.7
West: Rd 4N											
5	L	22	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.84	27.1
2	T	11	3.0	0.048	5.7	LOS A	0.1	3.2	0.41	0.60	30.0
12	R	44	3.0	0.062	5.7	LOS A	0.2	3.9	0.40	0.68	29.6
Approach		78	3.0	0.062	5.7	LOS A	0.2	3.9	0.40	0.71	28.8
All Vehicles		1600	4.6	0.426	7.5	LOS A	2.2	58.0	0.25	0.49	28.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

HCS 2010 Two-Way Stop Control Summary Report

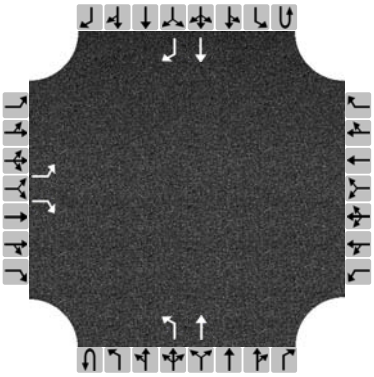
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2026
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		50						30	220				490	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		59						35						
Capacity		295		515						981						
v/c Ratio		0.04		0.11						0.04						
95% Queue Length		0.1		0.4						0.1						
Control Delay (s/veh)		17.7		12.9						8.8						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	13.7								1.0							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

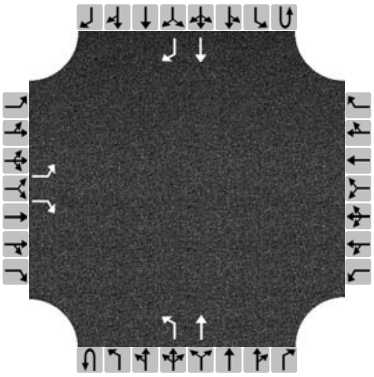
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2026
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		30						30	540				370	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

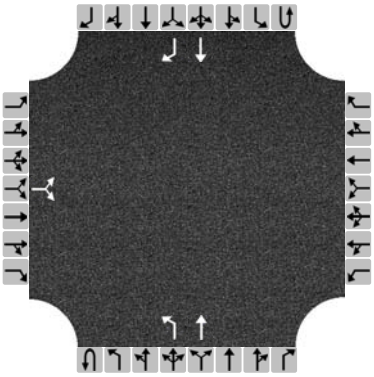
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		33						33						
Capacity		234		638						1131						
v/c Ratio		0.05		0.05						0.03						
95% Queue Length		0.1		0.2						0.1						
Control Delay (s/veh)		21.1		10.9						8.3						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	13.5								0.4							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Big Chino Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Big Chino Rd
Analysis Year	2026	North/South Street	SR 89
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		20		220						60	170				250	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized		No				No				No				No		
Median Type	Undivided															
Median Storage																

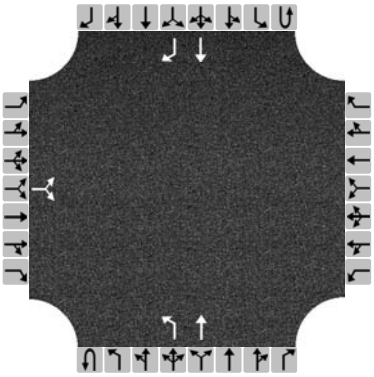
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			283							71						
Capacity			696							1248						
v/c Ratio			0.41							0.06						
95% Queue Length			2.0							0.2						
Control Delay (s/veh)			13.7							8.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	13.7								2.1							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Big Chino Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Big Chino Rd
Analysis Year	2026	North/South Street	SR 89
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		30		100						230	290				290	40
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

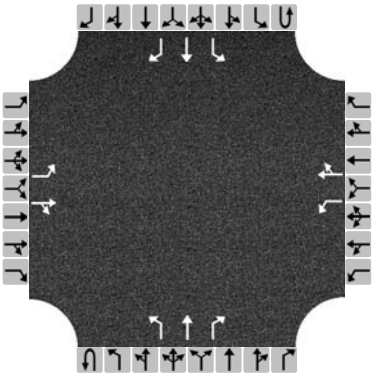
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			144							256						
Capacity			412							1186						
v/c Ratio			0.35							0.22						
95% Queue Length			1.5							0.8						
Control Delay (s/veh)			18.4							8.9						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	18.4								3.9							
Approach LOS	C															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Bramble Dr
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Bramble/San Francisco
Analysis Year	2026	North/South Street	SR 89
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	0	100		10	10	0		30	150	10		0	80	0
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		118		12		12		35						
Capacity		586		959		482		566		1492				1379		
v/c Ratio		0.02		0.12		0.02		0.02		0.02						
95% Queue Length		0.1		0.4		0.1		0.1		0.1						
Control Delay (s/veh)		11.3		9.3		12.7		11.5		7.5				7.6		
Level of Service (LOS)		B		A		B		B		A				A		
Approach Delay (s/veh)	9.5				12.1				1.2							
Approach LOS	A				B											

HCS 2010 Two-Way Stop Control Summary Report

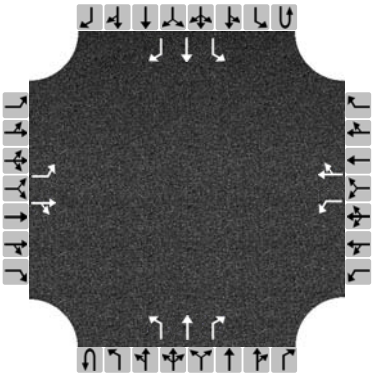
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2026
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	10	60		10	0	0		110	130	10		10	260	30
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

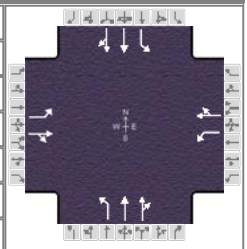
Flow Rate (veh/h)		11		78		11				122				11		
Capacity		324		631		271				1231				1417		
v/c Ratio		0.03		0.12		0.04				0.10				0.01		
95% Queue Length		0.1		0.4		0.1				0.3				0.0		
Control Delay (s/veh)		16.5		11.5		18.9				8.2				7.6		
Level of Service (LOS)		C		B		C				A				A		
Approach Delay (s/veh)	12.1				18.9				3.6				0.2			
Approach LOS	B				C											

APPENDIX WP1-7

2036 HCS and SIDRA Results

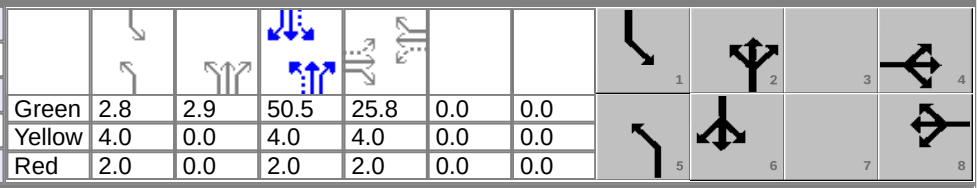
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	AM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2036	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_AM_20 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	70	200	60	60	40	90	340	40	20	680	100

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	2.9	50.5	25.8	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0

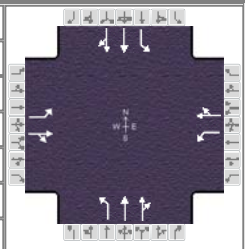
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		31.8		31.8	11.6	59.4	8.8	56.5
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.5		4.5	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		18.6		24.5	4.6		2.6	
Green Extension Time (g_e), s		2.0		1.4	0.2	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.94		0.46	
Max Out Probability		0.08		0.53	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	78	300		67	111		100	214	208	22	443	423
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1277	1644		1075	1738		1774	1810	1743	1774	1810	1728
Queue Service Time (g_s), s	5.1	16.6		6.0	5.1		2.6	6.2	6.3	0.6	16.0	16.1
Cycle Queue Clearance Time (g_c), s	10.2	16.6		22.5	5.1		2.6	6.2	6.3	0.6	16.0	16.1
Green Ratio (*g/C*)	0.26	0.26		0.26	0.26		0.56	0.53	0.53	0.53	0.51	0.51
Capacity (*c*), veh/h	338	425		172	449		391	966	931	554	915	873
Volume-to-Capacity Ratio (*X*)	0.230	0.707		0.387	0.248		0.256	0.221	0.224	0.040	0.485	0.485
Back of Queue (*Q*), ft/ln (50 th percentile)	41.5	175		42.4	54.1		24	61.4	59	5.5	163.5	154.6
Back of Queue (*Q*), veh/ln (50 th percentile)	1.6	7.0		1.7	2.2		0.9	2.4	2.4	0.2	6.4	6.2
Queue Storage Ratio (*RQ*) (50 th percentile)	0.33	0.00		0.42	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	33.4	33.6		43.8	29.4		11.7	12.3	12.3	11.2	16.2	16.2
Incremental Delay (d_2), s/veh	0.3	3.5		1.4	0.3		0.3	0.5	0.6	0.0	1.8	1.9
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	33.7	37.2		45.2	29.7		12.1	12.8	12.9	11.2	18.0	18.1
Level of Service (LOS)	C	D		D	C		B	B	B	B	B	B
Approach Delay, s/veh / LOS	36.5	D		35.5	D		12.7	B		17.9	B	
Intersection Delay, s/veh / LOS	21.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	1.1	A	0.8	A	0.9	A	1.2	A

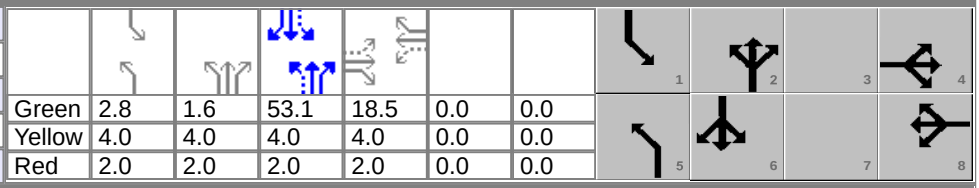
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	PM Peak Hour	PHF	0.90
Urban Street	SR 89	Analysis Year	2036	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_PM_20 Year Horizon.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	100	60	130	40	40	20	280	770	60	20	620	40

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	2.8	1.6	53.1	18.5	0.0	0.0
Yellow	4.0	4.0	4.0	4.0	0.0	0.0
Red	2.0	2.0	2.0	2.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	1.1	4.0	1.1	4.0
Phase Duration, s		24.5		24.5	16.4	66.7	8.8	59.1
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		13.9		17.5	9.3		2.6	
Green Extension Time (g_e), s		1.3		1.0	1.0	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.46	
Max Out Probability		0.10		0.44	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	111	211		44	67		311	467	455	22	370	363
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1329	1658		1166	1757		1774	1810	1763	1774	1810	1770
Queue Service Time (g_s), s	7.7	11.9		3.7	3.2		7.3	13.7	13.7	0.6	12.1	12.1
Cycle Queue Clearance Time (g_c), s	10.9	11.9		15.5	3.2		7.3	13.7	13.7	0.6	12.1	12.1
Green Ratio (*g/C*)	0.19	0.19		0.19	0.19		0.65	0.61	0.61	0.56	0.53	0.53
Capacity (*c*), veh/h	276	307		150	326		551	1099	1070	392	961	940
Volume-to-Capacity Ratio (*X*)	0.402	0.687		0.296	0.205		0.565	0.425	0.425	0.057	0.385	0.386
Back of Queue (*Q*), ft/ln (50 th percentile)	66	127.7		28.4	35.3		60.8	127	122	5.1	119.5	115.7
Back of Queue (*Q*), veh/ln (50 th percentile)	2.6	5.1		1.1	1.4		2.4	5.0	4.9	0.2	4.7	4.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.53	0.00		0.28	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	39.1	38.0		45.2	34.5		9.0	10.4	10.4	10.2	13.8	13.8
Incremental Delay (d_2), s/veh	0.9	3.3		1.1	0.3		0.9	1.2	1.2	0.1	1.2	1.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	40.0	41.3		46.3	34.8		9.9	11.6	11.6	10.3	15.0	15.0
Level of Service (LOS)	D	D		D	C		A	B	B	B	B	B
Approach Delay, s/veh / LOS	40.9	D		39.4	D		11.2	B		14.9	B	
Intersection Delay, s/veh / LOS	17.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.7	A	1.5	A	1.1	A

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 20 Year Horizon - AM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	33	3.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.87	27.1
8	T	422	5.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.42	30.4
18	R	22	3.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.55	29.6
Approach		478	4.8	0.232	5.7	LOS A	0.9	24.5	0.16	0.46	30.1
East: Rd 4N											
1	L	44	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.86	27.0
6	T	22	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.59	30.0
16	R	22	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.65	29.5
Approach		89	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.74	28.3
North: SR 89											
7	L	11	3.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.87	25.9
4	T	778	5.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.48	28.6
14	R	44	3.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.58	28.0
Approach		833	4.9	0.429	8.6	LOS A	2.2	56.3	0.32	0.49	28.5
West: Rd 4N											
5	L	22	3.0	0.059	7.0	LOS A	0.2	3.9	0.50	0.90	26.5
2	T	11	3.0	0.059	7.0	LOS A	0.2	3.9	0.50	0.69	29.1
12	R	67	3.0	0.112	7.4	LOS A	0.3	7.2	0.49	0.75	28.5
Approach		100	3.0	0.112	7.2	LOS A	0.3	7.2	0.49	0.78	28.1
All Vehicles		1500	4.6	0.429	7.4	LOS A	2.2	56.3	0.28	0.52	28.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N 20 Year Horizon - PM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	67	3.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.84	25.5
8	T	856	5.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.44	28.2
18	R	67	3.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.55	27.6
Approach		989	4.7	0.485	9.2	LOS A	2.8	71.8	0.26	0.47	27.9
East: Rd 4N											
1	L	22	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.92	26.1
6	T	11	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.71	28.5
16	R	33	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.76	28.1
Approach		67	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.81	27.4
North: SR 89											
7	L	22	3.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.87	26.5
4	T	600	5.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.47	29.4
14	R	22	3.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.58	28.8
Approach		644	4.9	0.331	7.2	LOS A	1.5	38.5	0.28	0.49	29.3
West: Rd 4N											
5	L	22	3.0	0.050	6.0	LOS A	0.1	3.3	0.44	0.86	27.0
2	T	11	3.0	0.050	6.0	LOS A	0.1	3.3	0.44	0.62	29.8
12	R	44	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.70	29.4
Approach		78	3.0	0.065	6.0	LOS A	0.2	4.1	0.43	0.74	28.6
All Vehicles		1778	4.6	0.485	8.3	LOS A	2.8	71.8	0.28	0.50	28.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

HCS 2010 Two-Way Stop Control Summary Report

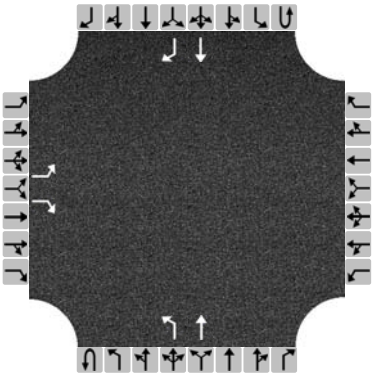
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		60						30	240				520	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		71						35						
Capacity		272		491						951						
v/c Ratio		0.04		0.14						0.04						
95% Queue Length		0.1		0.5						0.1						
Control Delay (s/veh)		18.9		13.6						8.9						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	14.3								1.0							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

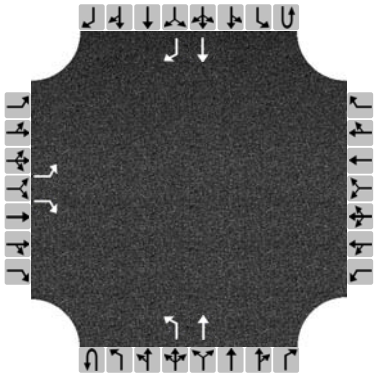
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Rolling Hills Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Rolling Hills Road
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		30						40	580				390	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		33						44						
Capacity		205		620						1110						
v/c Ratio		0.05		0.05						0.04						
95% Queue Length		0.2		0.2						0.1						
Control Delay (s/veh)		23.5		11.1						8.4						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	14.2								0.5							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

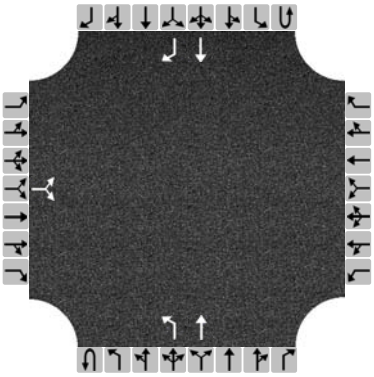
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Big Chino Rd
Jurisdiction	ADOT/CYMPO
East/West Street	Big Chino Rd
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		20		240						70	180				270	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized		No				No				No				No		
Median Type	Undivided															
Median Storage																

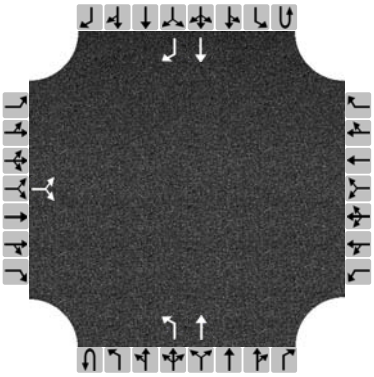
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			306							82						
Capacity			673							1223						
v/c Ratio			0.45							0.07						
95% Queue Length			2.4							0.2						
Control Delay (s/veh)			14.7							8.2						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	14.7								2.3							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Big Chino Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Big Chino Rd
Analysis Year	2036	North/South Street	SR 89
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		30		110						250	310				320	50
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)			155							278						
Capacity			378							1140						
v/c Ratio			0.41							0.24						
95% Queue Length			1.9							1.0						
Control Delay (s/veh)			21.0							9.2						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)	21.0								4.1							
Approach LOS	C															

HCS 2010 Two-Way Stop Control Summary Report

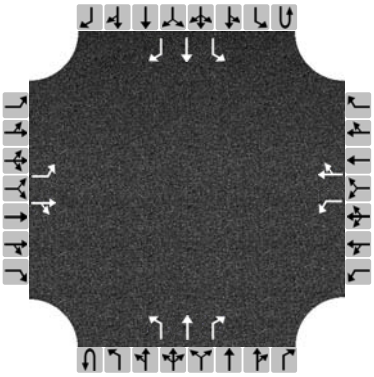
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.85
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	0	110		10	10	0		30	160	10		0	80	0
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		129		12		12		35						
Capacity		575		959		463		557		1492				1365		
v/c Ratio		0.02		0.13		0.03		0.02		0.02						
95% Queue Length		0.1		0.5		0.1		0.1		0.1						
Control Delay (s/veh)		11.4		9.3		13.0		11.6		7.5				7.6		
Level of Service (LOS)		B		A		B		B		A				A		
Approach Delay (s/veh)	9.5				12.3				1.1							
Approach LOS	A				B											

HCS 2010 Two-Way Stop Control Summary Report

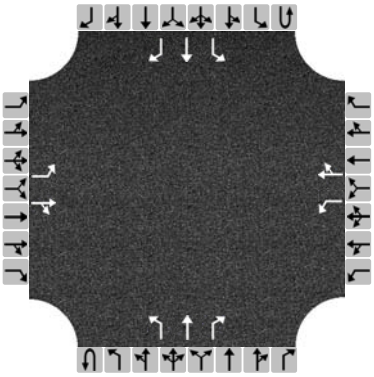
General Information

Analyst	KMS
Agency/Co.	Burgess & Niple
Date Performed	5/2016
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	SR 89 Transportation Study

Site Information

Intersection	SR 89 & Bramble Dr
Jurisdiction	ADOT/CYMPO
East/West Street	Bramble/San Francisco
North/South Street	SR 89
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	1	1	0	1	1	1
Configuration		L		TR		L		TR		L	T	R		L	T	R
Volume (veh/h)		10	10	60		10	0	0		120	140	20		10	290	30
Percent Heavy Vehicles		3	3	3		3	3	3		3				3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		78		11				133				11		
Capacity		289		595		240				1197				1390		
v/c Ratio		0.04		0.13		0.05				0.11				0.01		
95% Queue Length		0.1		0.4		0.1				0.4				0.0		
Control Delay (s/veh)		17.9		12.0		20.7				8.4				7.6		
Level of Service (LOS)		C		B		C				A				A		
Approach Delay (s/veh)	12.7				20.7				3.6				0.2			
Approach LOS	B				C											

APPENDIX WP2-1

Recommendations Map Book

State Route 89 Chino Valley to Forest Boundary
Transportation Study

ADOT Task Assignment MPD 0034-16

Appendix WP2-1 Recommendations Map Book

Prepared for:

ADOT

AND

CYMPO
Central Yavapai Metropolitan Planning Organization

Prepared by:

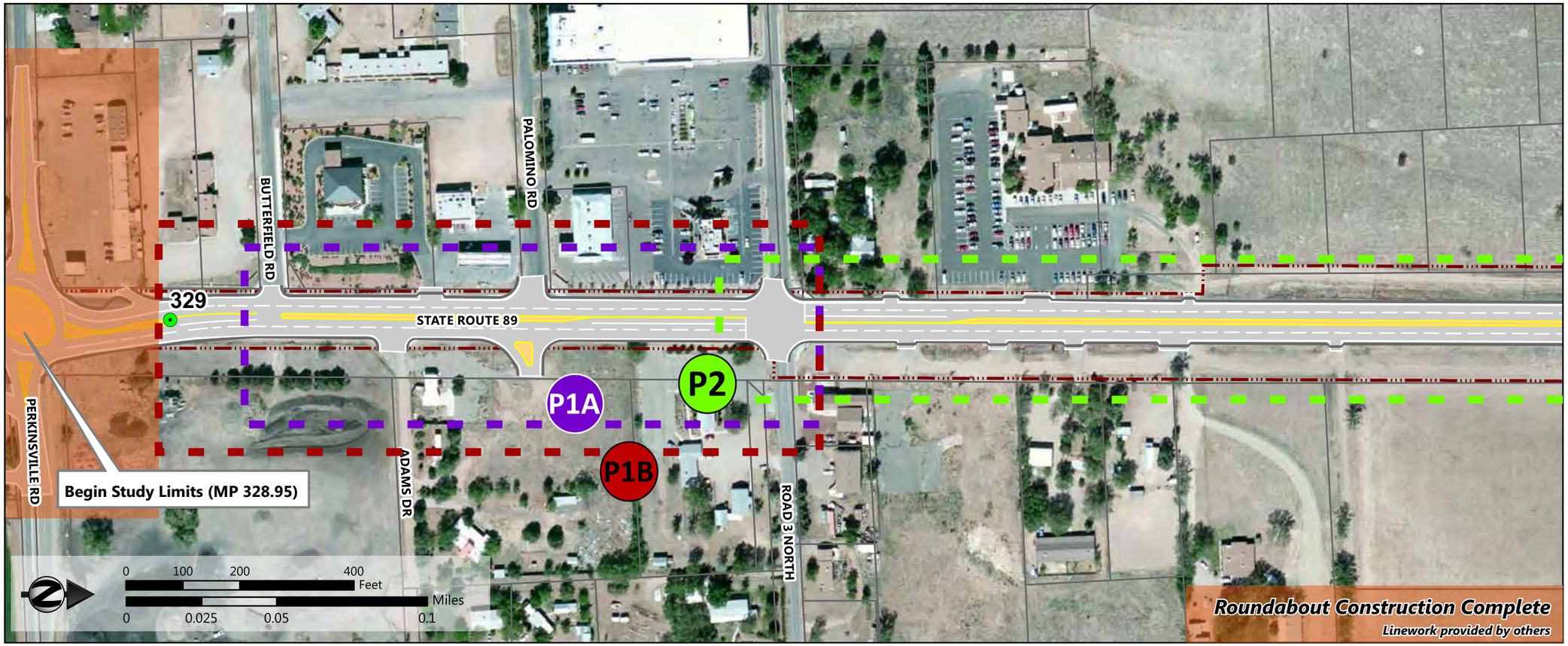
BURGESS & NIPLE

Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

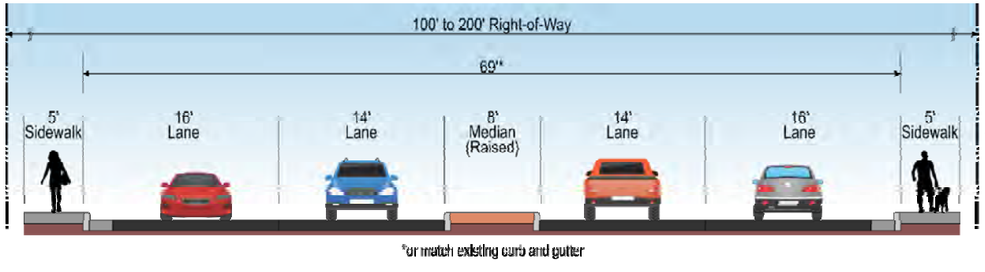
Project Horizons

- Near-Term
- Mid-Term
- Long-Term



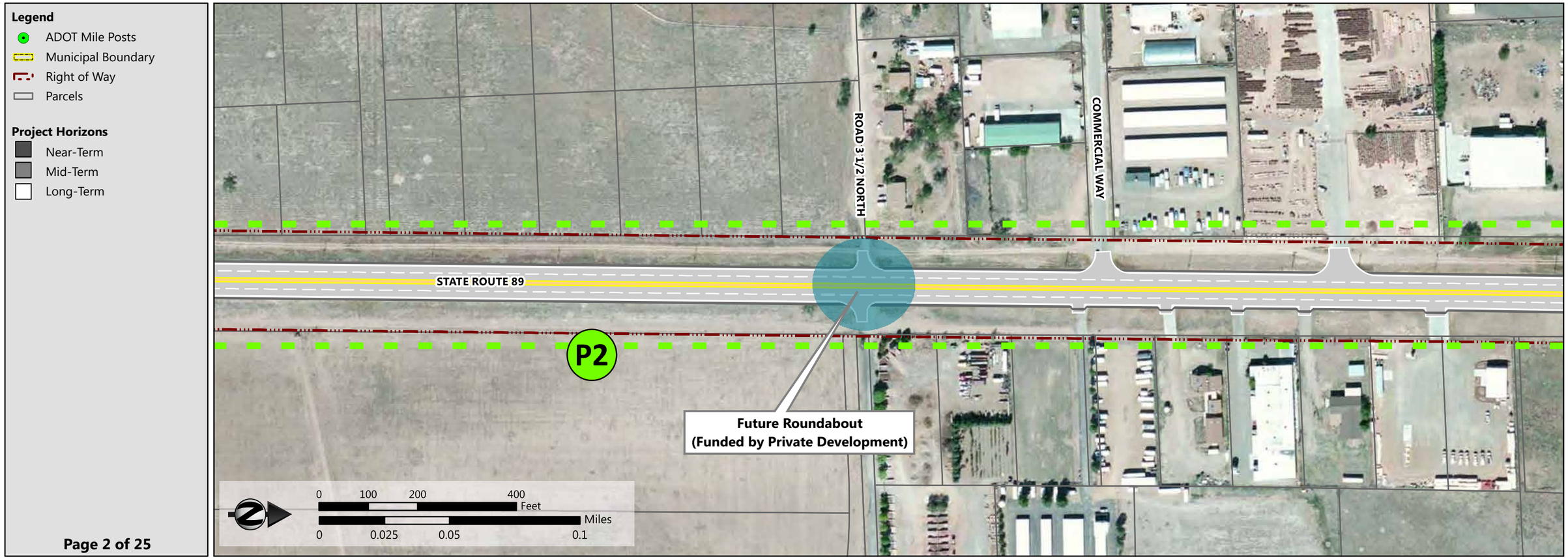
Project:	P1A - Install Raised Median from Butterfield Road to Road 3N and Retime Signal at Road 3N
Location:	Butterfield Road to Road 3N
Description:	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Butterfield Road to Road 3N. Mill and overlay existing asphaltic concrete pavement; existing curb and gutter to remain. Retime the existing signal at Road 3N with a 100 second cycle for both peaks, with a protected-permitted southbound left-turn, protected only northbound left-turn, and permitted only eastbound and westbound left-turns.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$490,000

Urban Highway Typical Section UA
Figure 306.4A in ADOT RDG Modified
w/ Narrowed Median & Sidewalk



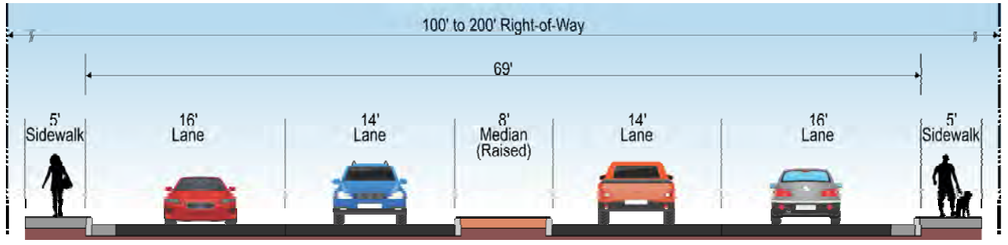
Project:	P1B: Install Raised Median from Perkinsville Road to Road 3N with Roundabout at Road 3N
Location:	Perkinsville Road to Road 3N
Description:	Convert TWLTL to 8-foot raised median and construct 5-foot sidewalk on both sides, from Perkinsville Road to Road 3N. Construct a two-lane roundabout at Road 3N.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$2,010,000

Project:	P2: Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N
Location:	Road 3N to Road 4N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 3N to Road 4N roundabout (under construction).
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$5,890,000



Project:	**P2: Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N**
Location:	Road 3N to Road 4N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 3N to Road 4N roundabout (under construction).
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$5,890,000

Urban Highway Typical Section UA
Figure 306.4A in ADOT RDG
Modified w/ Narrowed Median & Sidewalk

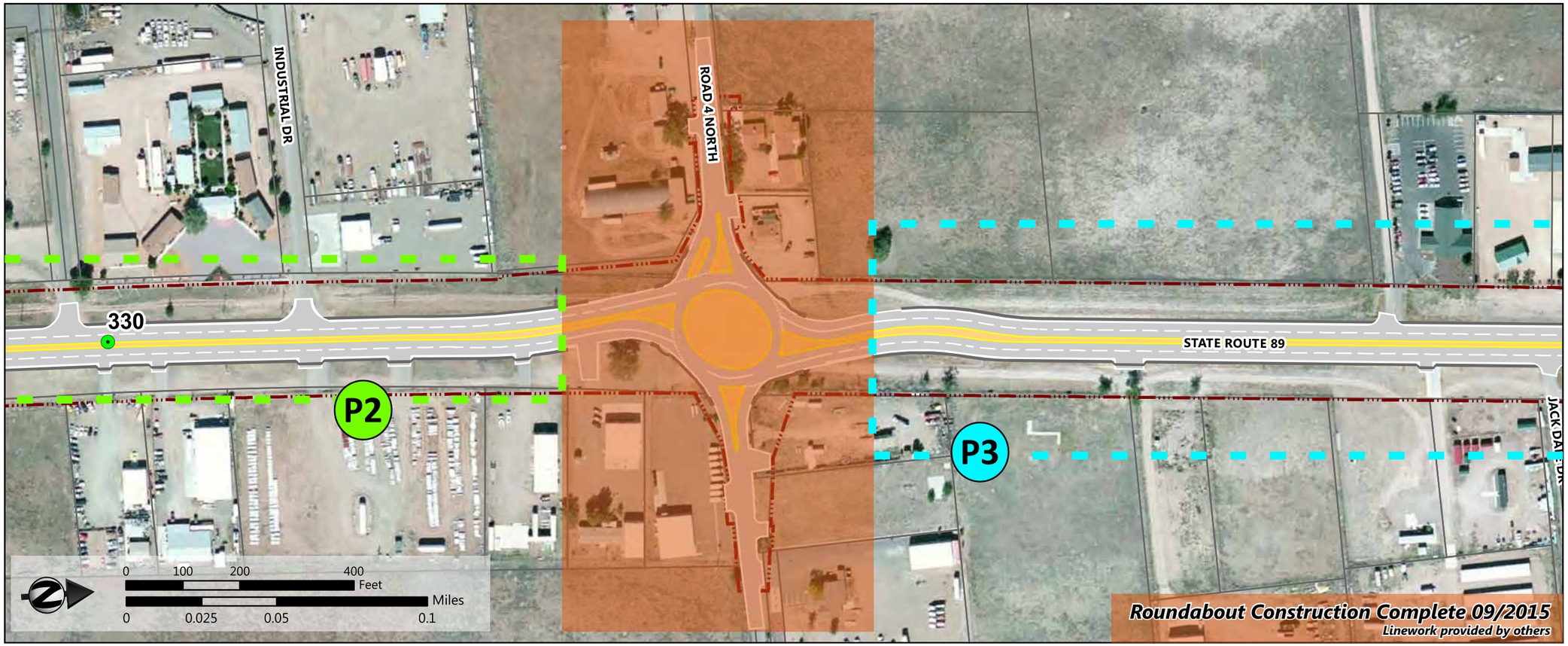


Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

Project Horizons

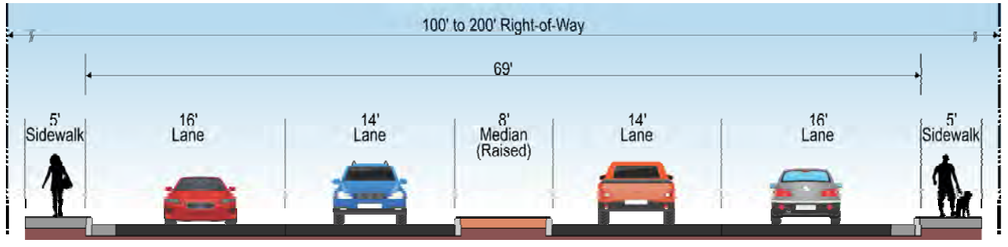
- Near-Term
- Mid-Term
- Long-Term



Project:	P2: Widen to Four-Lane Section with Raised Median from Road 3N to Road 4N
Location:	Road 3N to Road 4N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 3N to Road 4N roundabout (under construction).
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$5,890,000

Project:	P3 - Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N
Location:	Road 4N to Road 5N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout (under construction) to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase .
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$8,370,000

Urban Highway Typical Section UA
Figure 306.4A in ADOT RDG
Modified w/ Narrowed Median & Sidewalk

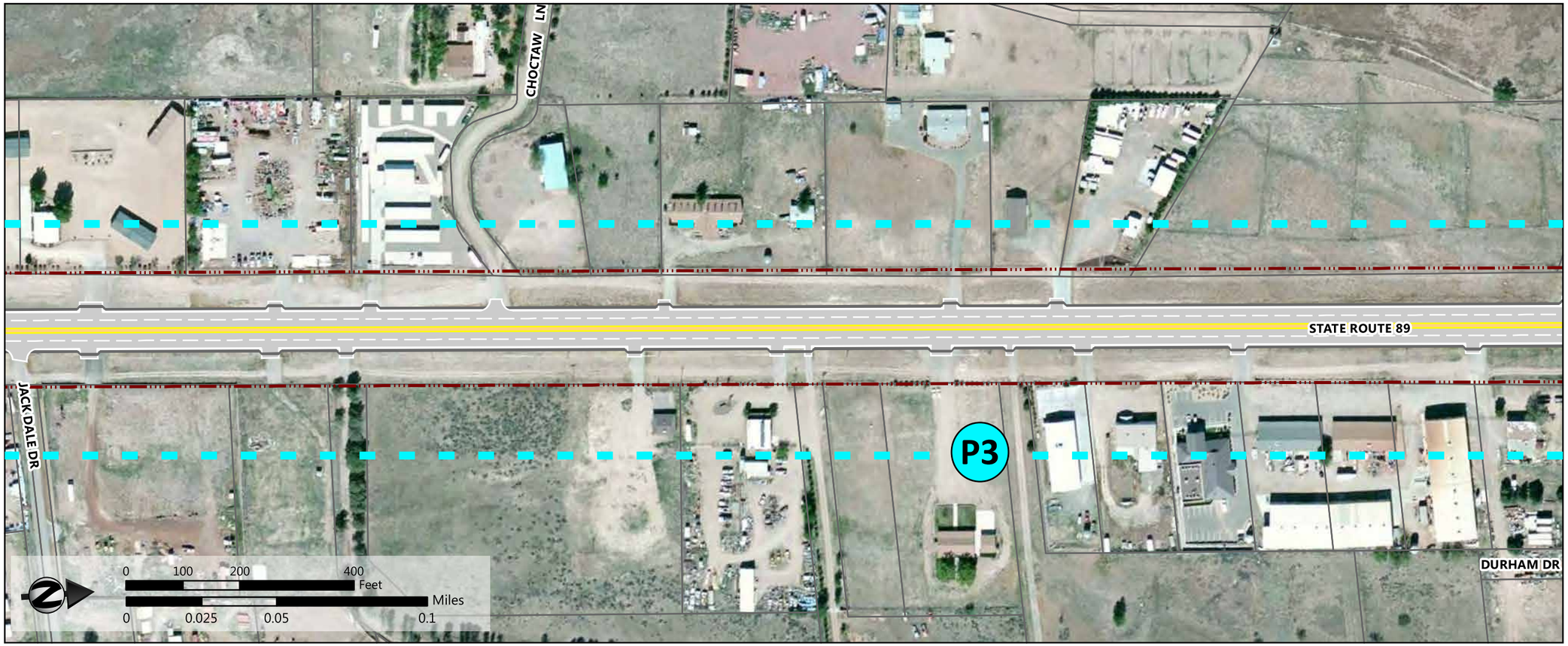


Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

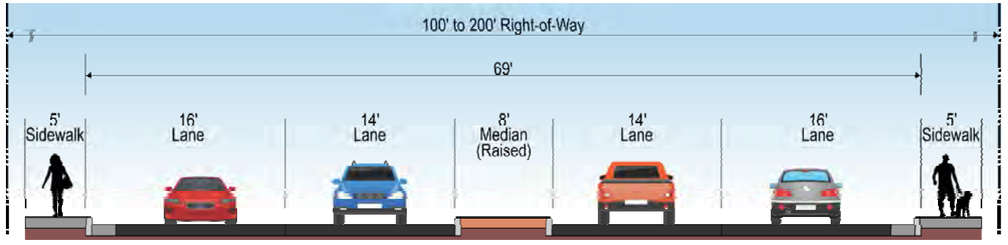
Project Horizons

- Near-Term
- Mid-Term
- Long-Term



Project:	**P3 - Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N**
Location:	Road 4N to Road 5N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout (under construction) to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase .
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$8,370,000

Urban Highway Typical Section UA
Figure 306.4A in ADOT RDG
Modified w/ Narrowed Median & Sidewalk

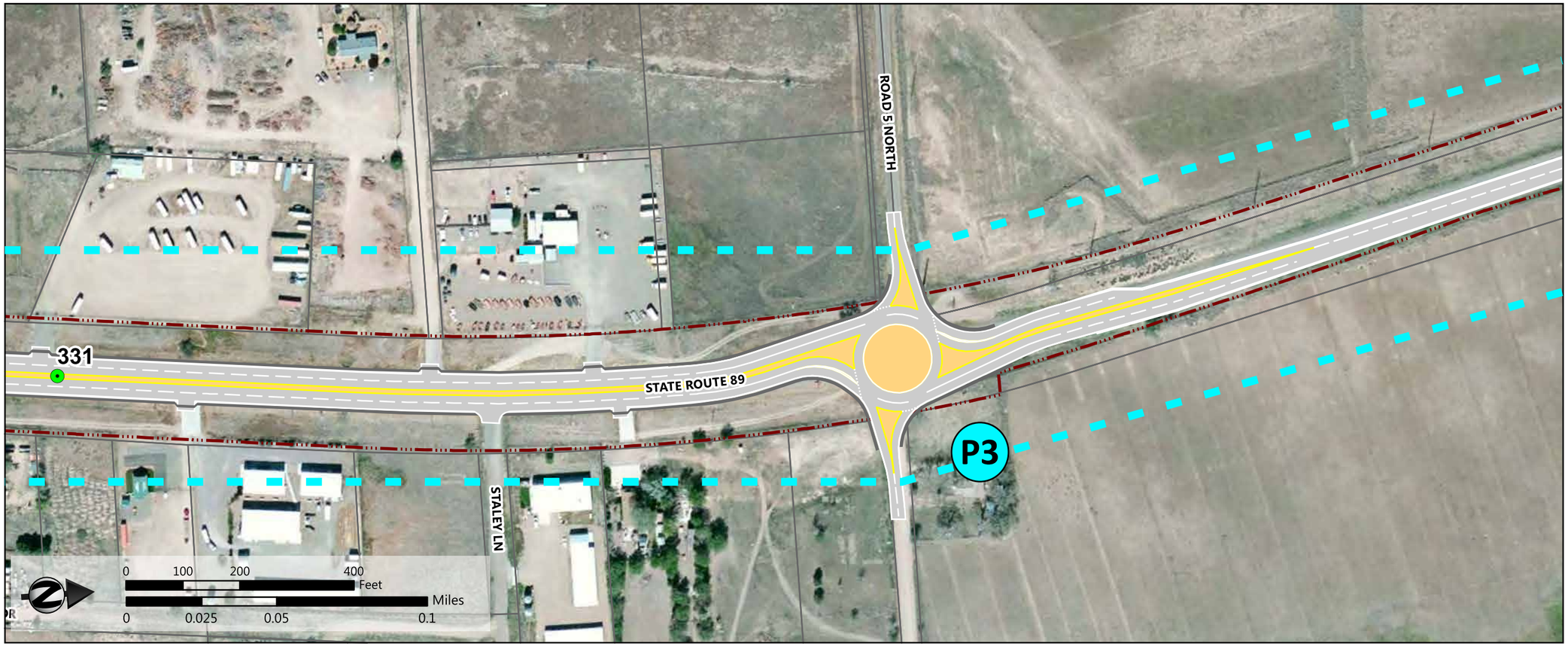


Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

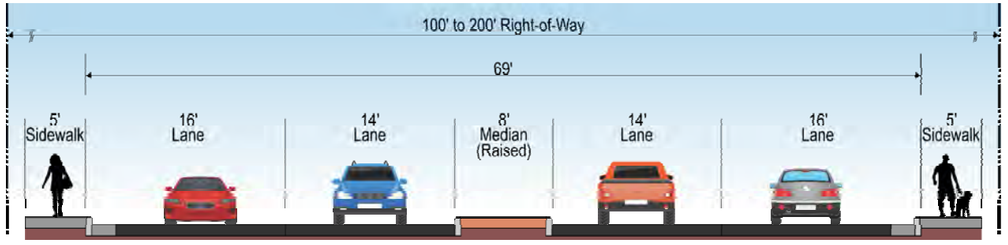
Project Horizons

- Near-Term
- Mid-Term
- Long-Term

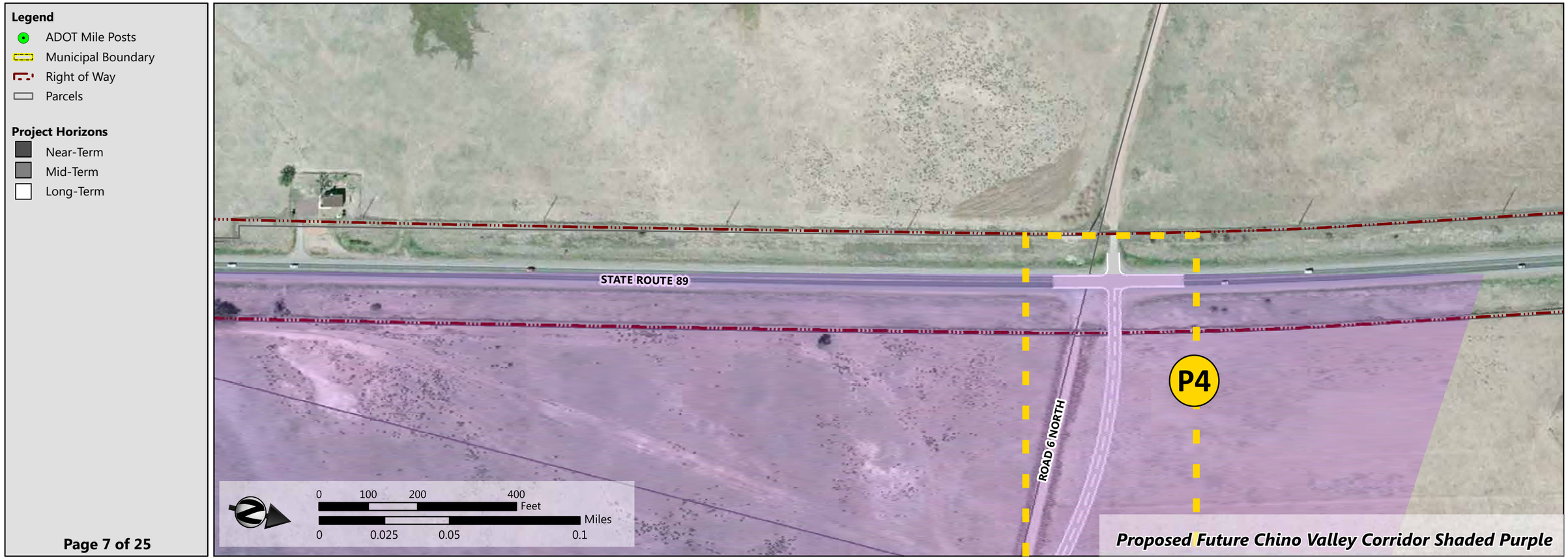


Project:	**P3 - Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N**
Location:	Road 4N to Road 5N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout (under construction) to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase .
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$8,370,000

Urban Highway Typical Section UA
Figure 306.4A in ADOT RDG
Modified w/ Narrowed Median & Sidewalk



Project:	**P3 - Widen to Four-Lane Section with Raised Median from Road 4N to Road 5N and Construct Roundabout at Road 5N**
Location:	Road 4N to Road 5N
Description:	Widen to four-lane typical urban section, modified to have an 8-foot raised median and 5-foot sidewalk on both sides, from Road 4N roundabout (under construction) to proposed Road 5N Roundabout. This project could be constructed in phases, with the roundabout at Road 5N as the first phase .
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$8,370,000



Project:	**P4 - Align Approaches at Road 6N**
Description:	Reconstruct the east and westbound approaches at the Road 6N intersection so that they align (offset approximately 70 feet).
Primary Purpose(s):	Access Management
Cost:	$480,000

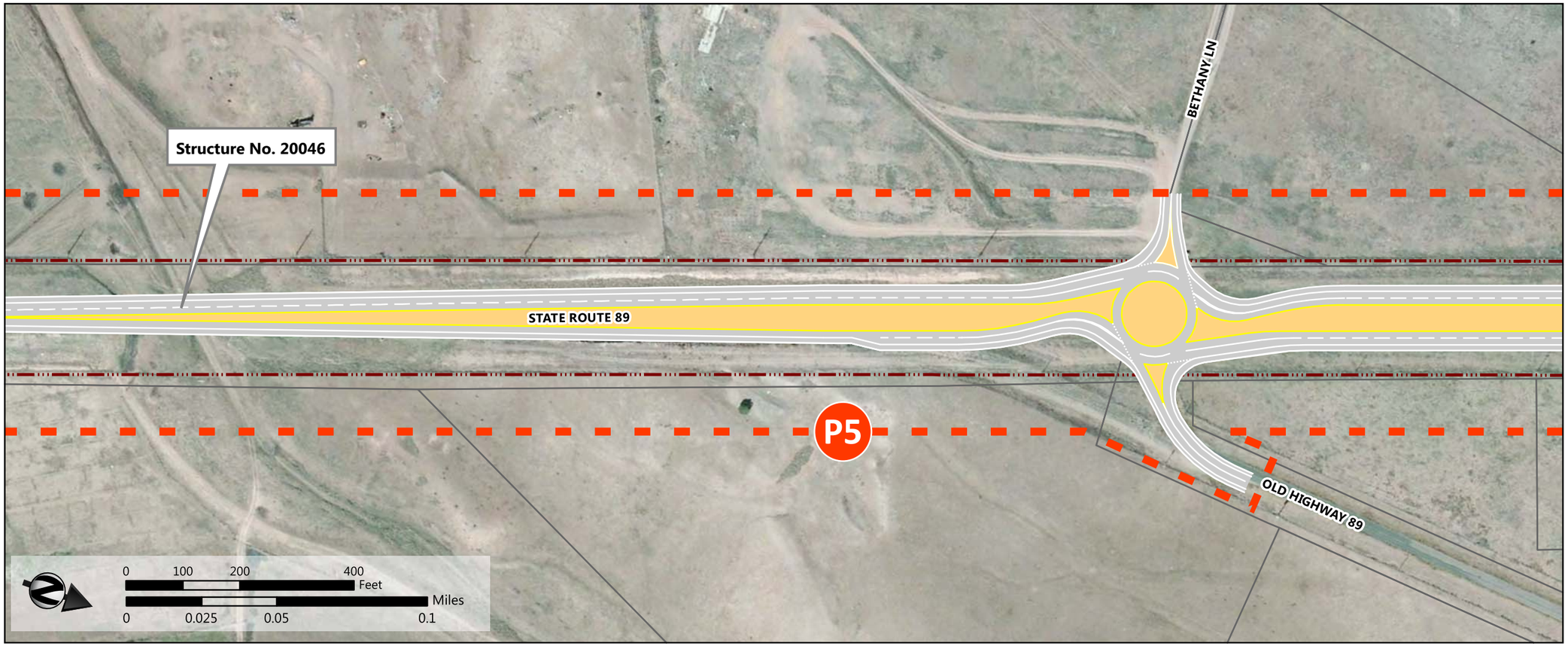
Project:	P5 - Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road
Description:	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$13,190,000

Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

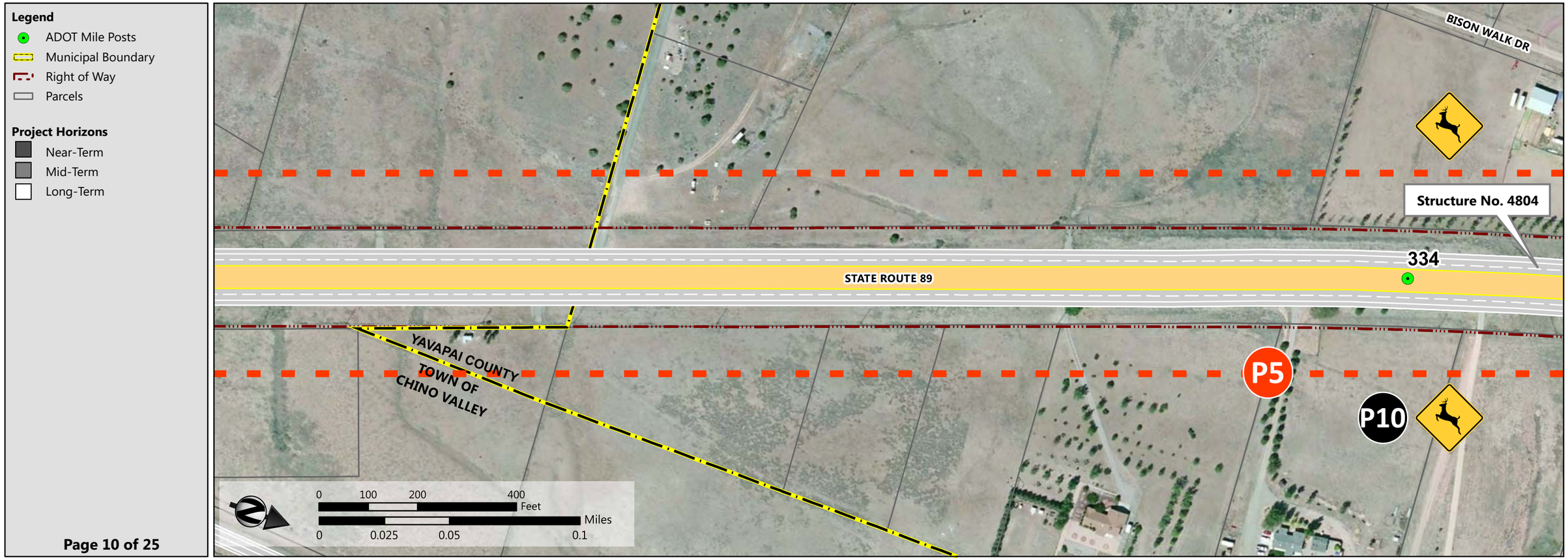
Project Horizons

- Near-Term
- Mid-Term
- Long-Term



Project:	**P5 - Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road**
Description:	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$13,190,000

Fringe-Urban Highway Typical Section
Figure 306.3 in ADOT RDG



Project:	P5 - Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road
Description:	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$13,190,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

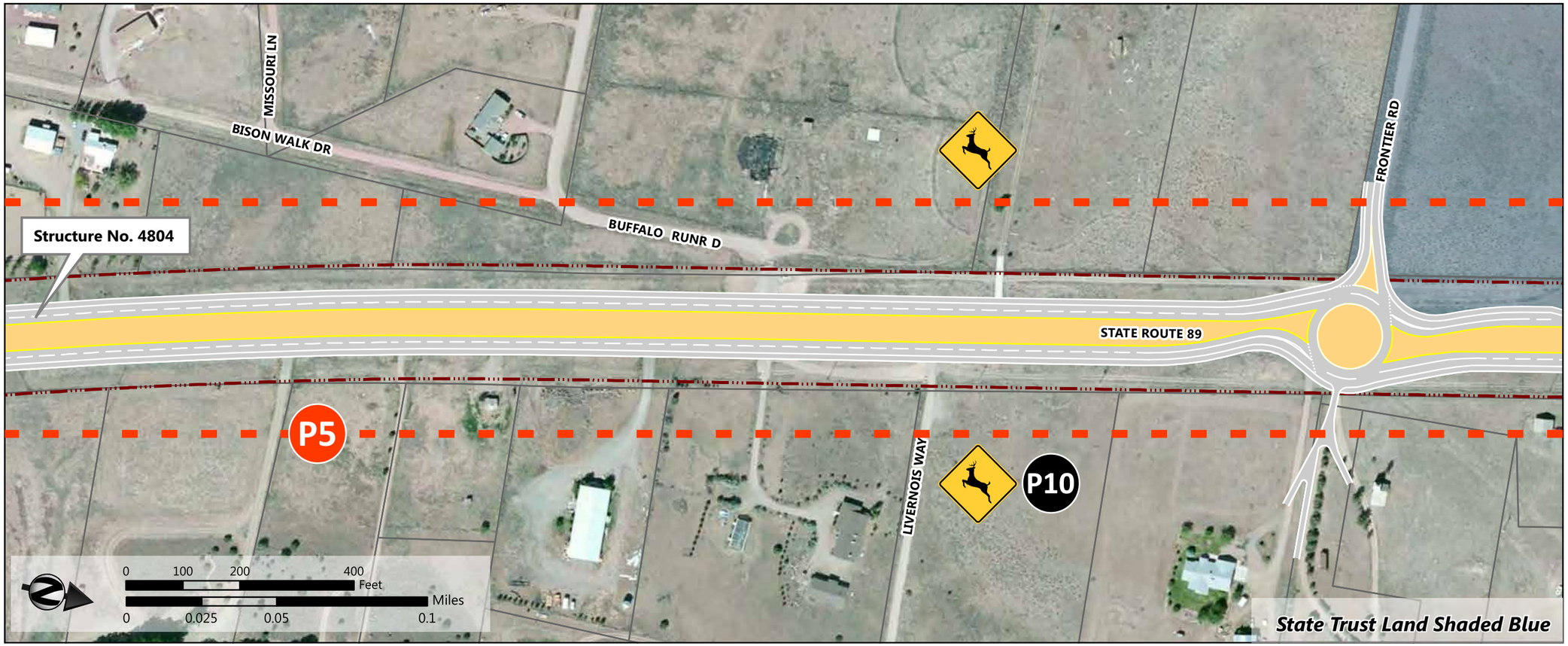
Fringe-Urban Highway Typical Section
Figure 306.3 in ADOT RDG

Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

Project Horizons

- Near-Term
- Mid-Term
- Long-Term



Project:	P5 - Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road
Description:	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$13,190,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

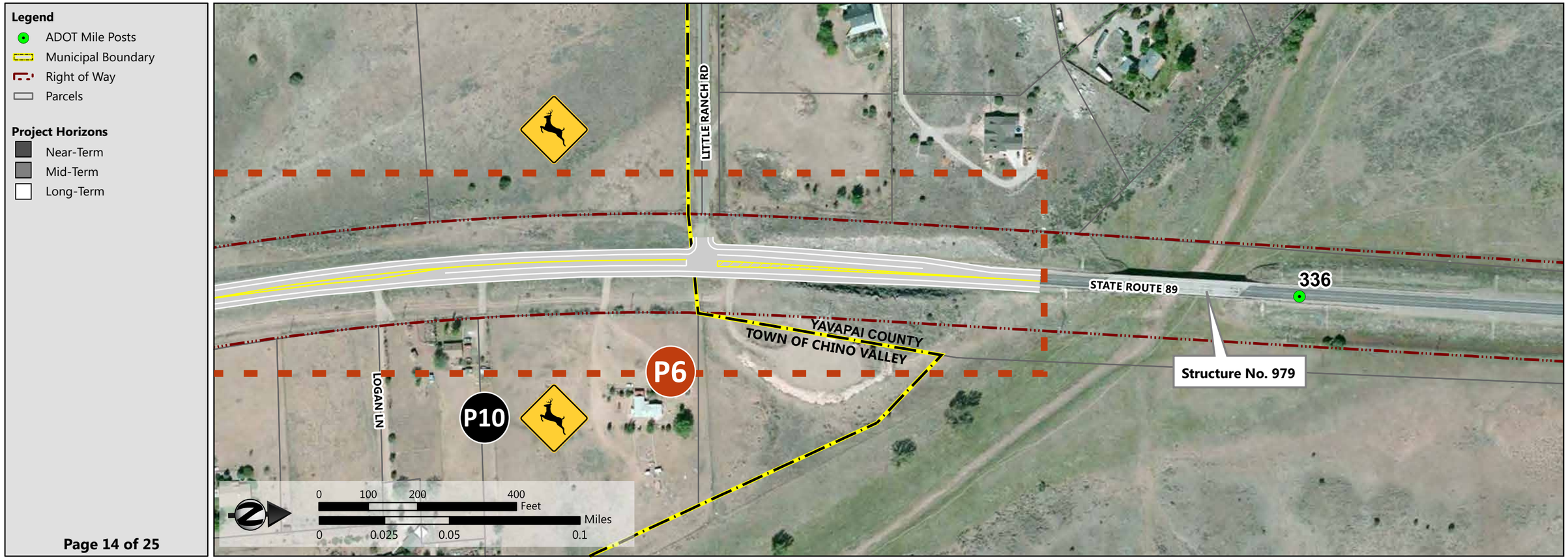
Fringe-Urban Highway Typical Section
Figure 306.3 in ADOT RDG

Project:	P5 - Widen to Four-Lane Section with Graded Median from Old Highway 89 to Frontier Road and Construct Roundabouts at Old Highway 89 and Frontier Road
Description:	Widen to a four-lane facility conforming to ADOT's fringe urban typical section, with no curb and a standard width, graded median between Old Highway 89 and Frontier Road. Construct two-lane roundabouts at Old Highway 89 and Frontier Road. This project could be constructed in phases, with either/both roundabouts constructed as the first phase.
Primary Purpose(s):	Access Management, Safety, Accommodate Future Development
Cost:	$13,190,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

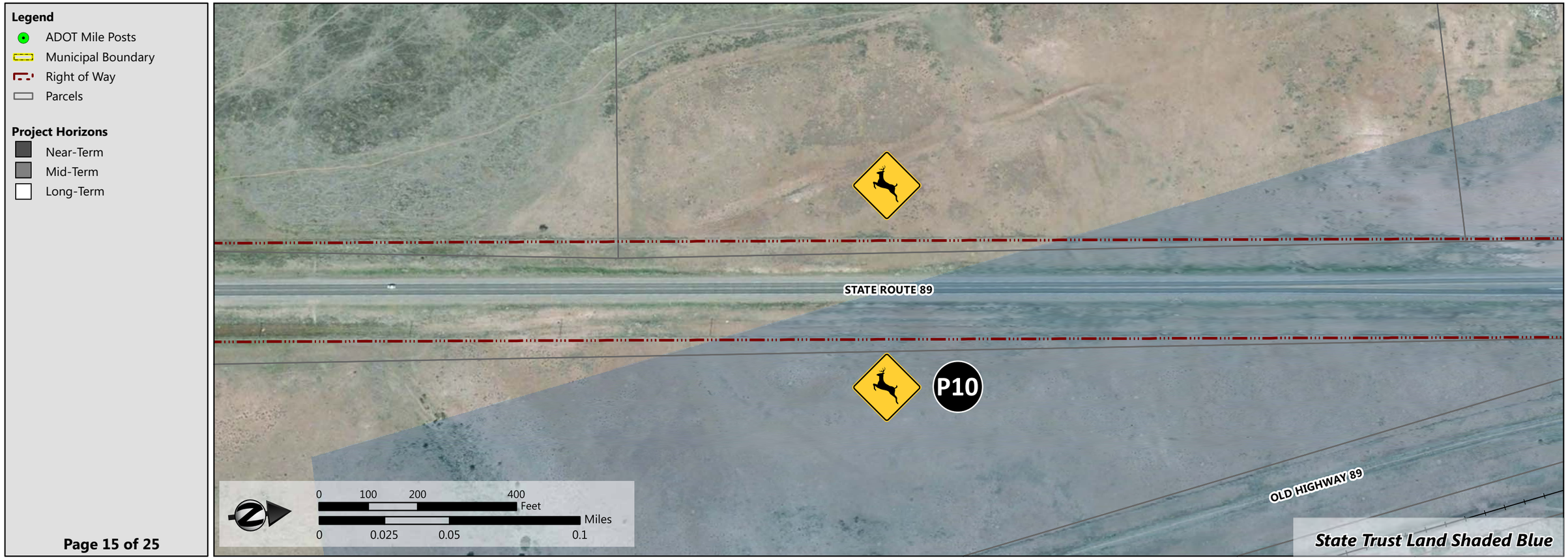
Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

Project:	P6 - Construct Left- and Right-Turn Lanes at Little Ranch Road
Description:	Construct left- and right-turn lanes at Little Ranch Road.
Primary Purpose(s):	Access Management and Safety
Cost:	$1,410,000

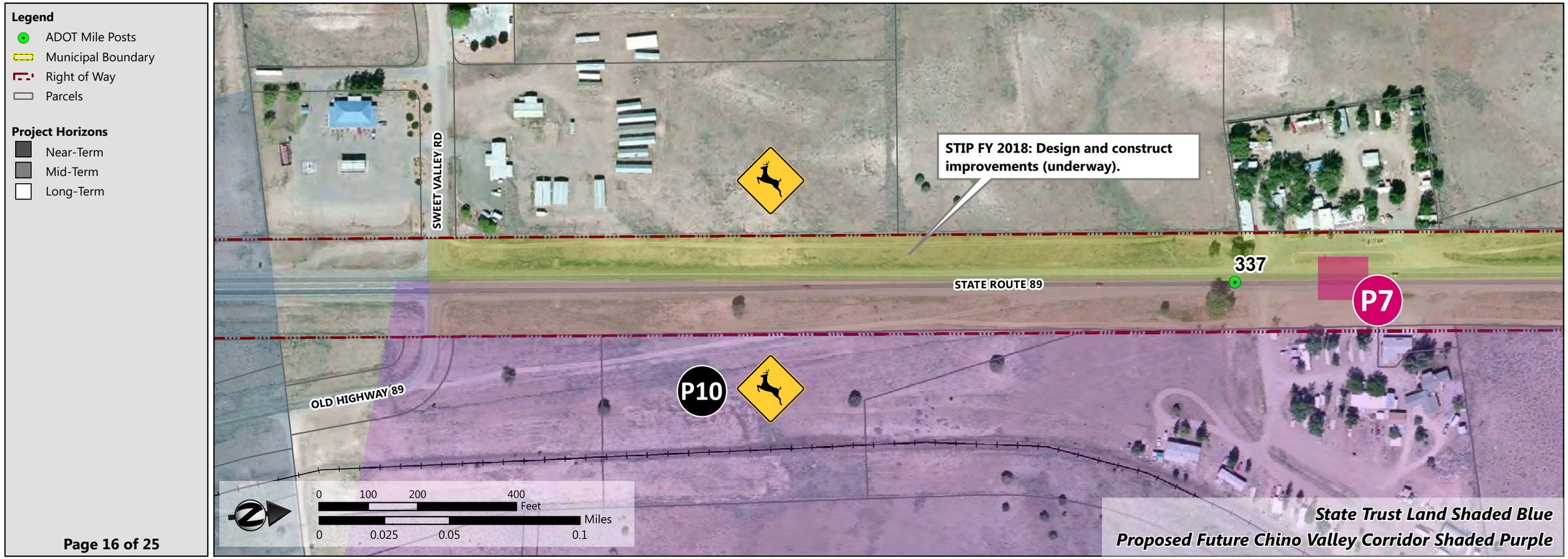


Project:	P6 - Construct Left- and Right-Turn Lanes at Little Ranch Road
Description:	Construct left- and right-turn lanes at Little Ranch Road.
Primary Purpose(s):	Access Management and Safety
Cost:	$1,410,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

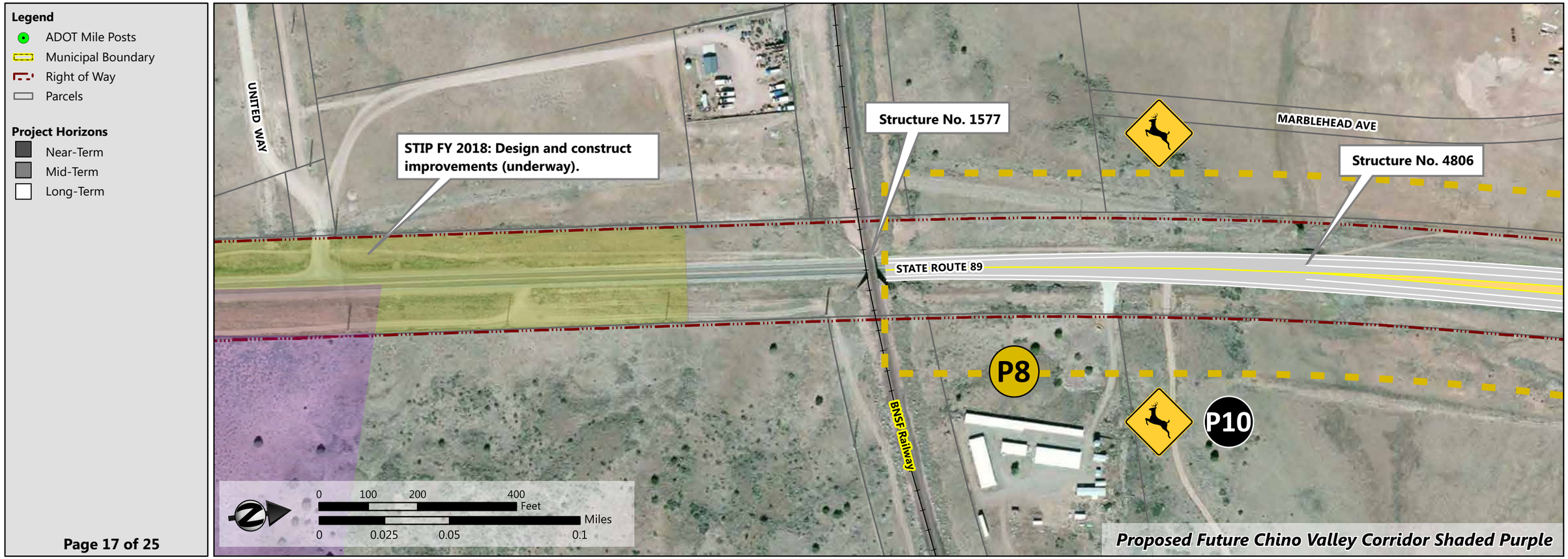


Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000



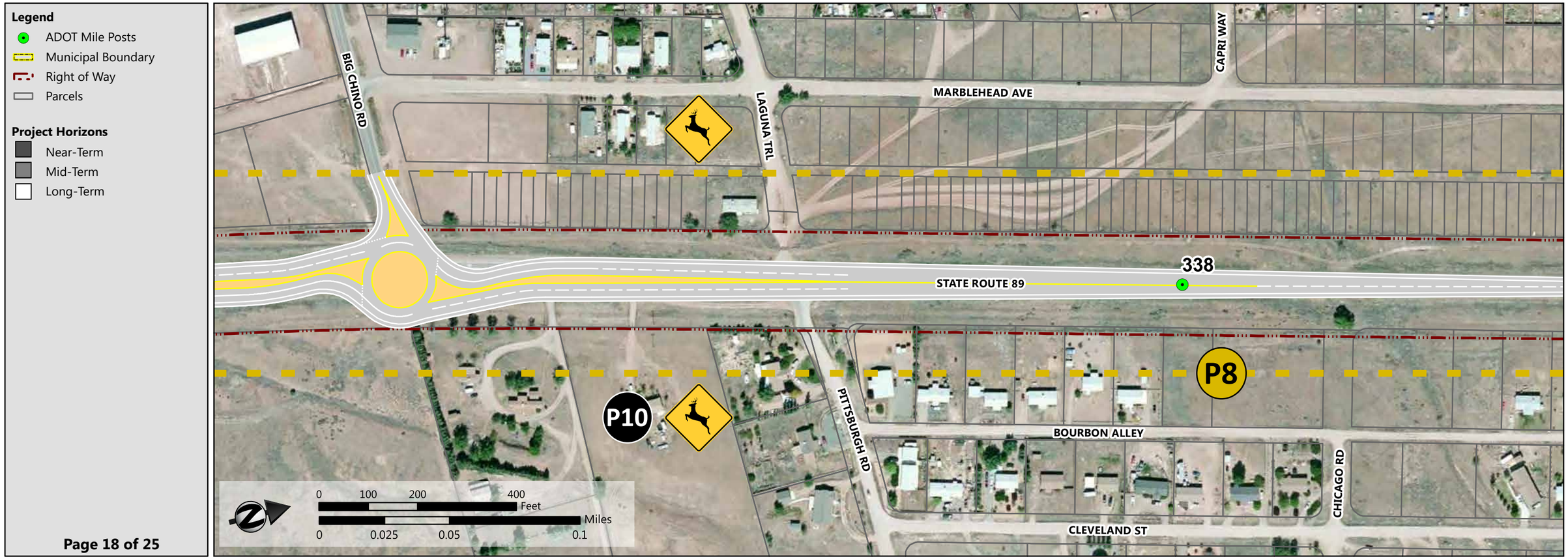
Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

Project:	P7 - Install Lighting
Description:	Install street lighting at the Paulden post office. Cost and CMF assume spot lighting with four poles. Bundling this project with the currently programmed project should be considered.
Primary Purpose(s):	Safety
Cost:	$90,000



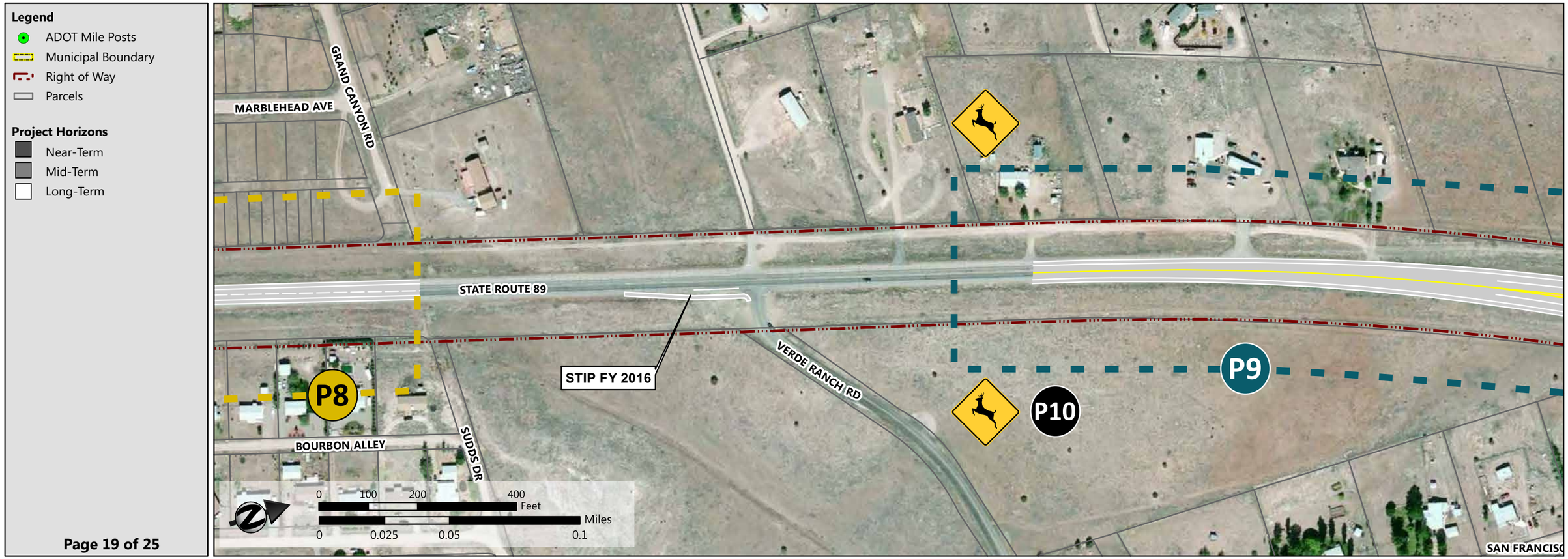
Project:	P8 - Big Chino Road Roundabout
Description:	Construct a two-lane roundabout. This project could be bundled with the roundabout at Bramble Drive or constructed sequentially as needed.
Primary Purpose(s):	Safety, Access Management, Accommodate Future Development
Cost:	$4,540,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000



Project:	P8 - Big Chino Road Roundabout
Description:	Construct a two-lane roundabout. This project could be bundled with the roundabout at Bramble Drive or constructed sequentially as needed.
Primary Purpose(s):	Safety, Access Management, Accommodate Future Development
Cost:	$4,540,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000



Project:	P8 - Big Chino Road Roundabout
Description:	Construct a two-lane roundabout. This project could be bundled with the roundabout at Bramble Drive or constructed sequentially as needed.
Primary Purpose(s):	Safety, Access Management, Accommodate Future Development
Cost:	$4,540,000

Project:	P9 - Bramble Drive Roundabout
Description:	Construct a two-lane roundabout. This project could be bundled with the roundabout at Big Chino Road or constructed sequentially as needed.
Primary Purpose(s):	Safety and Access Management
Cost:	$5,100,000

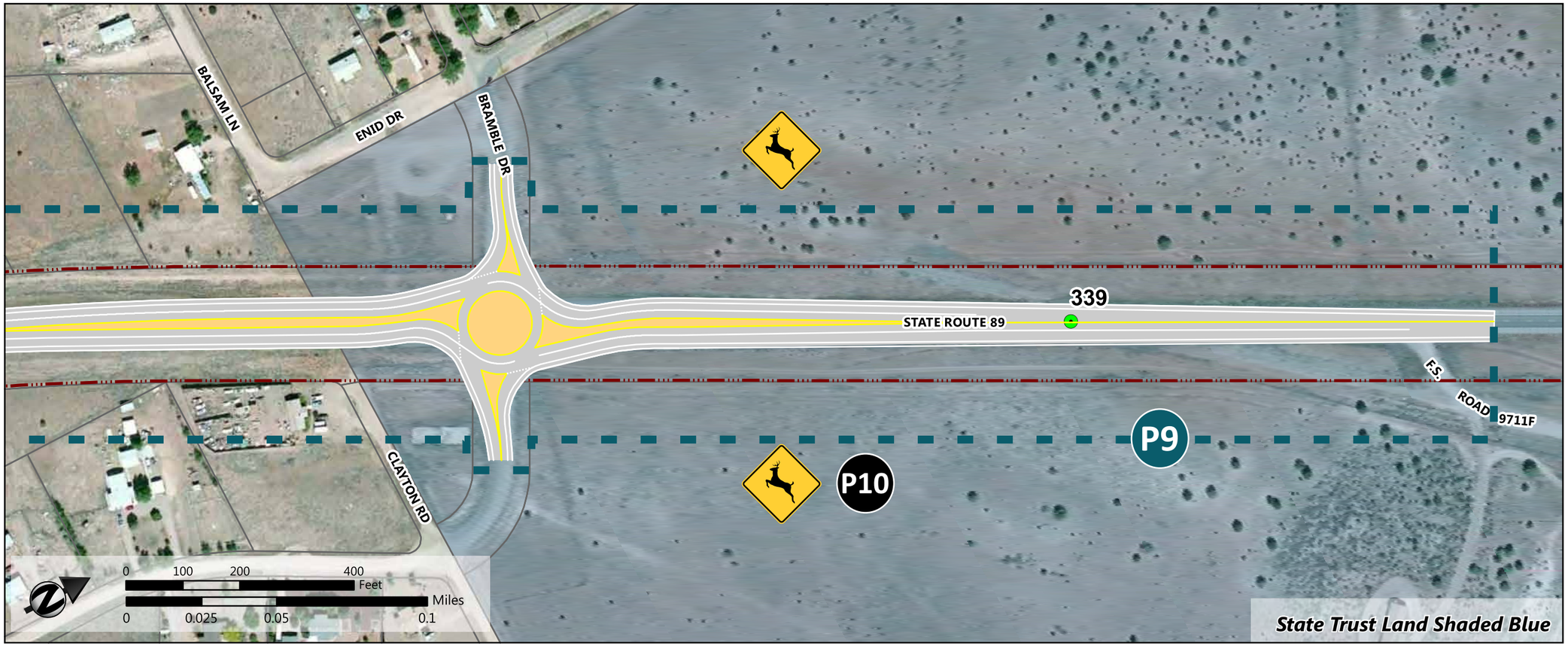
Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

Legend

- ADOT Mile Posts
- Municipal Boundary
- Right of Way
- Parcels

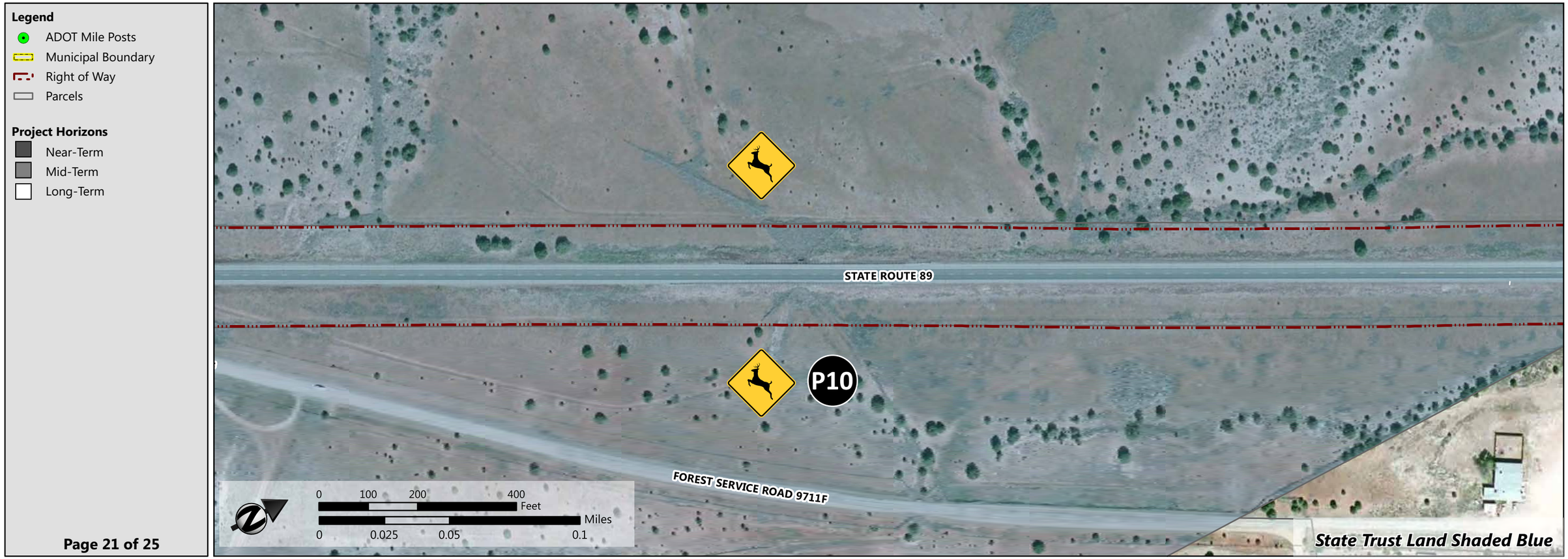
Project Horizons

- Near-Term
- Mid-Term
- Long-Term

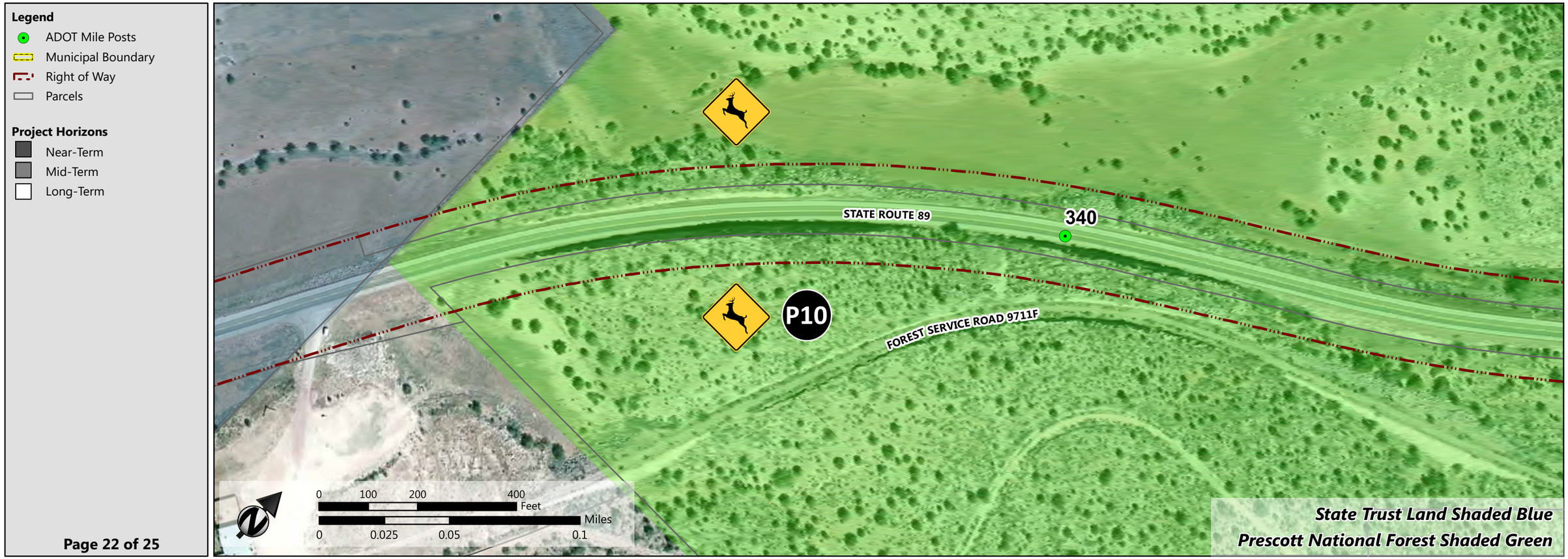


Project:	P9 - Bramble Drive Roundabout
Description:	Construct a two-lane roundabout. This project could be bundled with the roundabout at Big Chino Road or constructed sequentially as needed.
Primary Purpose(s):	Safety and Access Management
Cost:	$5,100,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000



Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000



Project:	**P10 - Install Wildlife Warning Signage**
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

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Primary Purpose(s):	Safety
Cost:	$3,000

Project:	P10 - Install Wildlife Warning Signage
Description:	Install wildlife warning signage from MP 334 to 348.
Primary Purpose(s):	Safety
Cost:	$3,000

APPENDIX WP2-2

Project Probable Cost Derivation

Butterfield Road to Road 3N	MP	329.00	to MP	329.20
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	6,653	$2.00	$13,400
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	739	$8.00	$6,000
SAW CUTTING	L.FT.	1,130	$1.50	$1,700
EARTHWORK	L.SUM	1	$3,856.00	$3,900
ASPHALT SURFACE COURSE	SQ.YD.	6,653	$6.00	$40,000
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	277	$50.00	$13,900
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	6,864	$0.50	$3,500
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$20,000.00	$20,000
CONCRETE CURB	L.FT.	1,219	$20.00	$24,400
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	10,129	$3.00	$30,400
CONCRETE SIDEWALK RAMP	EACH	12	$2,000.00	$24,000
CONCRETE DRIVEWAY	SQ.FT.	815	$15.00	$12,300
MEDIAN PAVING	SQ.YD.	553	$60.00	$33,200
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$226,700**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$18,200.00	$18,200
Quality Control (1%)	COST	1.00%	$2,300.00	$2,300
Construction Surveying (1.5%)	COST	1.50%	$3,500.00	$3,500
Erosion Control (1%)	COST	1.00%	$2,300.00	$2,300
Mobilization (12%)	COST	12.00%	$27,300.00	$27,300
			PROJECTWIDE SUBTOTAL	**$53,600**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$84,100.00	$84,100
			PROJECTWIDE TOTAL	**$137,700**
Construction Engineering (9%)	COST	9.00%	$32,800.00	$32,800
Construction Contingencies (5%)	COST	5.00%	$18,300.00	$18,300
Engineering Design (10%)	COST	10.00%	$36,500.00	$36,500
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$87,600**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$37,800.00	$37,800

SUMMARY

ITEM TOTAL	**$226,700**
PROJECTWIDE TOTAL	**$137,700**
OTHER COST TOTAL	**$87,600**
ICAP	**$37,800**
TOTAL	**$490,000**

Road 3N Roundabout	MP	329.20	to MP	329.20
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	2,600	$5.00	$13,000
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	7,200	$8.00	$57,600
SAW CUTTING	L.FT.	288	$1.50	$500
EARTHWORK	L.SUM	1	$19,424.00	$19,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	6,899	$50.00	$345,000
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	3,000	$0.50	$1,500
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	1,905	$20.00	$38,100
CONCRETE CURB AND GUTTER	L.FT.	2,400	$15.00	$36,000
CONCRETE SIDEWALK	SQ.FT.	10,685	$3.00	$32,100
CONCRETE SIDEWALK RAMP	EACH	16	$2,000.00	$32,000
CONCRETE DRIVEWAY	SQ.FT.	2,746	$15.00	$41,200
MEDIAN PAVING	SQ.YD.	948	$60.00	$56,900
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	317	$135.00	$42,800
			ITEM TOTAL	**$931,200**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$74,500.00	$74,500
Quality Control (1%)	COST	1.00%	$9,400.00	$9,400
Construction Surveying (1.5%)	COST	1.50%	$14,000.00	$14,000
Erosion Control (1%)	COST	1.00%	$9,400.00	$9,400
Mobilization (12%)	COST	12.00%	$111,800.00	$111,800
			PROJECTWIDE SUBTOTAL	**$219,100**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$345,100.00	$345,100
			PROJECTWIDE TOTAL	**$564,200**
Construction Engineering (9%)	COST	9.00%	$134,600.00	$134,600
Construction Contingencies (5%)	COST	5.00%	$74,800.00	$74,800
Engineering Design (10%)	COST	10.00%	$149,600.00	$149,600
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$359,000**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$155,100.00	$155,100

SUMMARY

ITEM TOTAL	**$931,200**
PROJECTWIDE TOTAL	**$564,200**
OTHER COST TOTAL	**$359,000**
ICAP	**$155,100**
TOTAL	**$2,010,000**

Road 3N to Road 4N	MP	329.20	to MP	330.16
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	2,800	$5.00	$14,000
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	27,314	$8.00	$218,600
SAW CUTTING	L.FT.	301	$1.50	$500
EARTHWORK	L.SUM	1	$87,100.00	$87,100
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	32,820	$50.00	$1,641,000
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	30,413	$0.50	$15,300
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$25,000.00	$25,000
CONCRETE CURB	L.FT.	10,000	$20.00	$200,000
CONCRETE CURB AND GUTTER	L.FT.	9,551	$15.00	$143,300
CONCRETE SIDEWALK	SQ.FT.	44,388	$3.00	$133,200
CONCRETE SIDEWALK RAMP	EACH	10	$2,000.00	$20,000
CONCRETE DRIVEWAY	SQ.FT.	9,268	$15.00	$139,100
MEDIAN PAVING	SQ.YD.	118	$60.00	$7,100
STORM SEWER ALLOWANCE	L.SUM	1	$82,000.00	$82,000
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$2,726,200**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$218,100.00	$218,100
Quality Control (1%)	COST	1.00%	$27,300.00	$27,300
Construction Surveying (1.5%)	COST	1.50%	$40,900.00	$40,900
Erosion Control (1%)	COST	1.00%	$27,300.00	$27,300
Mobilization (12%)	COST	12.00%	$327,200.00	$327,200
			PROJECTWIDE SUBTOTAL	**$640,800**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$1,010,100.00	$1,010,100
			PROJECTWIDE TOTAL	**$1,650,900**
Construction Engineering (9%)	COST	9.00%	$394,000.00	$394,000
Construction Contingencies (5%)	COST	5.00%	$218,900.00	$218,900
Engineering Design (10%)	COST	10.00%	$437,800.00	$437,800
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$1,050,700**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$453,800.00	$453,800

SUMMARY

ITEM TOTAL	**$2,726,200**
PROJECTWIDE TOTAL	**$1,650,900**
OTHER COST TOTAL	**$1,050,700**
ICAP	**$453,800**
TOTAL	**$5,890,000**

Road 4N to Road 5N	MP	330.24	to MP	331.22
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	1,400	$5.00	$7,000
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	25,297	$8.00	$202,400
SAW CUTTING	L.FT.	230	$1.50	$400
EARTHWORK	L.SUM	1	$101,000.00	$101,000
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	31,908	$50.00	$1,595,500
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	31,046	$0.50	$15,600
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$25,000.00	$25,000
CONCRETE CURB	L.FT.	10,035	$20.00	$200,800
CONCRETE CURB AND GUTTER	L.FT.	9,915	$15.00	$148,800
CONCRETE SIDEWALK	SQ.FT.	44,942	$3.00	$134,900
CONCRETE SIDEWALK RAMP	EACH	6	$2,000.00	$12,000
CONCRETE DRIVEWAY	SQ.FT.	11,463	$15.00	$172,000
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$2,615,400**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$209,300.00	$209,300
Quality Control (1%)	COST	1.00%	$26,200.00	$26,200
Construction Surveying (1.5%)	COST	1.50%	$39,300.00	$39,300
Erosion Control (1%)	COST	1.00%	$26,200.00	$26,200
Mobilization (12%)	COST	12.00%	$313,900.00	$313,900
			PROJECTWIDE SUBTOTAL	**$614,900**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$969,100.00	$969,100
			PROJECTWIDE TOTAL	**$1,584,000**
Construction Engineering (9%)	COST	9.00%	$378,000.00	$378,000
Construction Contingencies (5%)	COST	5.00%	$210,000.00	$210,000
Engineering Design (10%)	COST	10.00%	$420,000.00	$420,000
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$1,008,000**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$435,400.00	$435,400

SUMMARY

ITEM TOTAL	**$2,615,400**
PROJECTWIDE TOTAL	**$1,584,000**
OTHER COST TOTAL	**$1,008,000**
ICAP	**$435,400**
TOTAL	**$5,650,000**

Road 5N Roundabout	MP	331.28	to MP	331.28
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	12,149	$8.00	$97,200
SAW CUTTING	L.FT.	176	$1.50	$300
EARTHWORK	L.SUM	1	$51,180.00	$51,200
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	11,719	$50.00	$586,000
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	9,233	$0.50	$4,700
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	2,779	$20.00	$55,600
CONCRETE CURB AND GUTTER	L.FT.	4,634	$15.00	$69,600
CONCRETE SIDEWALK	SQ.FT.	5,000	$3.00	$15,000
CONCRETE SIDEWALK RAMP	EACH	16	$2,000.00	$32,000
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	1,426	$60.00	$85,600
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	384	$135.00	$51,900
			ITEM TOTAL	**$1,264,100**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$101,200.00	$101,200
Quality Control (1%)	COST	1.00%	$12,700.00	$12,700
Construction Surveying (1.5%)	COST	1.50%	$19,000.00	$19,000
Erosion Control (1%)	COST	1.00%	$12,700.00	$12,700
Mobilization (12%)	COST	12.00%	$151,700.00	$151,700
			PROJECTWIDE SUBTOTAL	**$297,300**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$468,500.00	$468,500
			PROJECTWIDE TOTAL	**$765,800**
Construction Engineering (9%)	COST	9.00%	$182,700.00	$182,700
Construction Contingencies (5%)	COST	5.00%	$101,500.00	$101,500
Engineering Design (10%)	COST	10.00%	$203,000.00	$203,000
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$487,200**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$210,500.00	$210,500

SUMMARY

ITEM TOTAL	**$1,264,100**
PROJECTWIDE TOTAL	**$765,800**
OTHER COST TOTAL	**$487,200**
ICAP	**$210,500**
TOTAL	**$2,730,000**

Road 6N Intersection Realignment	MP	332.35	to MP	332.35
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	1,691	$8.00	$13,600
SAW CUTTING	L.FT.	100	$1.50	$200
EARTHWORK	L.SUM	1	$20,400.00	$20,400
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	3,592	$50.00	$179,700
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	500	$0.50	$300
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$5,000.00	$5,000
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$219,200**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$17,600.00	$17,600
`	COST	1.00%	$2,200.00	$2,200
Construction Surveying (1.5%)	COST	1.50%	$3,300.00	$3,300
Erosion Control (1%)	COST	1.00%	$2,200.00	$2,200
Mobilization (12%)	COST	12.00%	$26,400.00	$26,400
			PROJECTWIDE SUBTOTAL	**$51,700**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$81,300.00	$81,300
			PROJECTWIDE TOTAL	**$133,000**
Construction Engineering (9%)	COST	9.00%	$31,700.00	$31,700
Construction Contingencies (5%)	COST	5.00%	$17,700.00	$17,700
Engineering Design (10%)	COST	10.00%	$35,300.00	$35,300
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$84,700**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$36,600.00	$36,600

SUMMARY

ITEM TOTAL	**$219,200**
PROJECTWIDE TOTAL	**$133,000**
OTHER COST TOTAL	**$84,700**
ICAP	**$36,600**
TOTAL	**$480,000**

Old Highway 89 Roundabout	MP	333.41	to MP	333.41
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	20,000	$8.00	$160,000
SAW CUTTING	L.FT.	136	$1.50	$300
EARTHWORK	L.SUM	1	$30,088.00	$30,100
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	28,204	$50.00	$1,410,300
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	16,000	$0.50	$8,000
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	1,403	$20.00	$28,100
CONCRETE CURB AND GUTTER	L.FT.	1,797	$15.00	$27,000
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	1,533	$60.00	$92,000
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$2,019,900**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$161,600.00	$161,600
Quality Control (1%)	COST	1.00%	$20,200.00	$20,200
Construction Surveying (1.5%)	COST	1.50%	$30,300.00	$30,300
Erosion Control (1%)	COST	1.00%	$20,200.00	$20,200
Mobilization (12%)	COST	12.00%	$242,400.00	$242,400
			PROJECTWIDE SUBTOTAL	**$474,700**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$748,400.00	$748,400
			PROJECTWIDE TOTAL	**$1,223,100**
Construction Engineering (9%)	COST	9.00%	$291,900.00	$291,900
Construction Contingencies (5%)	COST	5.00%	$162,200.00	$162,200
Engineering Design (10%)	COST	10.00%	$324,300.00	$324,300
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$778,400**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$336,200.00	$336,200

SUMMARY

ITEM TOTAL	**$2,019,900**
PROJECTWIDE TOTAL	**$1,223,100**
OTHER COST TOTAL	**$778,400**
ICAP	**$336,200**
TOTAL	**$4,360,000**

Old Highway 89 to Frontier Road	MP	333.41	to MP	334.50
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	25,911	$8.00	$207,300
SAW CUTTING	L.FT.	176	$1.50	$300
EARTHWORK	L.SUM	1	$131,504.00	$131,600
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	39,091	$50.00	$1,954,600
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	31,800	$0.50	$15,900
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$40,000.00	$40,000
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$2,349,700**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$188,000.00	$188,000
Quality Control (1%)	COST	1.00%	$23,500.00	$23,500
Construction Surveying (1.5%)	COST	1.50%	$35,300.00	$35,300
Erosion Control (1%)	COST	1.00%	$23,500.00	$23,500
Mobilization (12%)	COST	12.00%	$282,000.00	$282,000
			PROJECTWIDE SUBTOTAL	**$552,300**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$870,600.00	$870,600
			PROJECTWIDE TOTAL	**$1,422,900**
Construction Engineering (9%)	COST	9.00%	$339,600.00	$339,600
Construction Contingencies (5%)	COST	5.00%	$188,700.00	$188,700
Engineering Design (10%)	COST	10.00%	$377,300.00	$377,300
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$905,600**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$391,100.00	$391,100

SUMMARY

ITEM TOTAL	**$2,349,700**
PROJECTWIDE TOTAL	**$1,422,900**
OTHER COST TOTAL	**$905,600**
ICAP	**$391,100**
TOTAL	**$5,070,000**

Frontier Road Roundabout	MP	334.50	to MP	334.50
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	17,600	$8.00	$140,800
SAW CUTTING	L.FT.	172	$1.50	$300
EARTHWORK	L.SUM	1	$55,200.00	$55,200
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	22,416	$50.00	$1,120,800
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	20,000	$0.50	$10,000
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	1,300	$20.00	$26,000
CONCRETE CURB AND GUTTER	L.FT.	1,520	$15.00	$22,800
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	1,691	$60.00	$101,500
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$1,741,500**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$139,400.00	$139,400
Quality Control (1%)	COST	1.00%	$17,500.00	$17,500
Construction Surveying (1.5%)	COST	1.50%	$26,200.00	$26,200
Erosion Control (1%)	COST	1.00%	$17,500.00	$17,500
Mobilization (12%)	COST	12.00%	$209,000.00	$209,000
			PROJECTWIDE SUBTOTAL	**$409,600**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$645,400.00	$645,400
			PROJECTWIDE TOTAL	**$1,055,000**
Construction Engineering (9%)	COST	9.00%	$251,700.00	$251,700
Construction Contingencies (5%)	COST	5.00%	$139,900.00	$139,900
Engineering Design (10%)	COST	10.00%	$279,700.00	$279,700
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$671,300**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$290,000.00	$290,000

SUMMARY

ITEM TOTAL	**$1,741,500**
PROJECTWIDE TOTAL	**$1,055,000**
OTHER COST TOTAL	**$671,300**
ICAP	**$290,000**
TOTAL	**$3,760,000**

Little Ranch Road Left-Turn Installation	MP	335.58	to MP	335.92
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	8,311	$8.00	$66,500
SAW CUTTING	L.FT.	118	$1.50	$200
EARTHWORK	L.SUM	1	$26,481.48	$26,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	9,766	$50.00	$488,300
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	8,800	$0.50	$4,400
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	0	$0.00	$0
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$585,900**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$46,900.00	$46,900
Quality Control (1%)	COST	1.00%	$5,900.00	$5,900
Construction Surveying (1.5%)	COST	1.50%	$8,800.00	$8,800
Erosion Control (1%)	COST	1.00%	$5,900.00	$5,900
Mobilization (12%)	COST	12.00%	$70,400.00	$70,400
			PROJECTWIDE SUBTOTAL	**$137,900**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$217,200.00	$217,200
			PROJECTWIDE TOTAL	**$355,100**
Construction Engineering (9%)	COST	9.00%	$84,700.00	$84,700
Construction Contingencies (5%)	COST	5.00%	$47,100.00	$47,100
Engineering Design (10%)	COST	10.00%	$94,100.00	$94,100
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$225,900**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$97,600.00	$97,600

SUMMARY

ITEM TOTAL	**$585,900**
PROJECTWIDE TOTAL	**$355,100**
OTHER COST TOTAL	**$225,900**
ICAP	**$97,600**
TOTAL	**$1,270,000**

Little Ranch Road Right-Turn Installation	MP	335.78	to MP	335.92
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	148	$8.00	$1,200
SAW CUTTING	L.FT.	665	$1.50	$1,000
EARTHWORK	L.SUM	1	$29,296.30	$29,300
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	685	$50.00	$34,300
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	1,330	$0.50	$700
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	0	$0.00	$0
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$66,500**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$5,400.00	$5,400
Quality Control (1%)	COST	1.00%	$700.00	$700
Construction Surveying (1.5%)	COST	1.50%	$1,000.00	$1,000
Erosion Control (1%)	COST	1.00%	$700.00	$700
Mobilization (12%)	COST	12.00%	$8,000.00	$8,000
			PROJECTWIDE SUBTOTAL	**$15,800**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$24,700.00	$24,700
			PROJECTWIDE TOTAL	**$40,500**
Construction Engineering (9%)	COST	9.00%	$9,700.00	$9,700
Construction Contingencies (5%)	COST	5.00%	$5,400.00	$5,400
Engineering Design (10%)	COST	10.00%	$10,700.00	$10,700
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$25,800**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$11,200.00	$11,200

SUMMARY

ITEM TOTAL	**$66,500**
PROJECTWIDE TOTAL	**$40,500**
OTHER COST TOTAL	**$25,800**
ICAP	**$11,200**
TOTAL	**$150,000**

Lighting	MP	337.00	to MP	337.10
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	0	$8.00	$0
SAW CUTTING	L.FT.	0	$1.50	$0
EARTHWORK	L.SUM	0	$0.00	$0
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	0	$50.00	$0
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	0	$0.50	$0
ROADWAY LIGHTING	L.SUM	1	$40,000.00	$40,000
LANDSCAPING ALLOWANCE	L.SUM	0	$0.00	$0
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$40,000**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$3,200.00	$3,200
Quality Control (1%)	COST	1.00%	$400.00	$400
Construction Surveying (1.5%)	COST	1.50%	$600.00	$600
Erosion Control (1%)	COST	1.00%	$400.00	$400
Mobilization (12%)	COST	12.00%	$4,800.00	$4,800
			PROJECTWIDE SUBTOTAL	**$9,400**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$14,900.00	$14,900
			PROJECTWIDE TOTAL	**$24,300**
Construction Engineering (9%)	COST	9.00%	$5,800.00	$5,800
Construction Contingencies (5%)	COST	5.00%	$3,300.00	$3,300
Engineering Design (10%)	COST	10.00%	$6,500.00	$6,500
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$15,600**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$6,700.00	$6,700

SUMMARY

ITEM TOTAL	**$40,000**
PROJECTWIDE TOTAL	**$24,300**
OTHER COST TOTAL	**$15,600**
ICAP	**$6,700**
TOTAL	**$90,000**

Big Chino Road Roundabout	MP	337.70	to MP	337.70
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	20,178	$8.00	$161,500
SAW CUTTING	L.FT.	124	$1.50	$200
EARTHWORK	L.SUM	1	$56,480.00	$56,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	29,198	$50.00	$1,459,900
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	24,400	$0.50	$12,200
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	3,723	$20.00	$74,500
CONCRETE CURB AND GUTTER	L.FT.	1,563	$15.00	$23,500
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	808	$60.00	$48,500
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$2,100,900**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$168,100.00	$168,100
Quality Control (1%)	COST	1.00%	$21,100.00	$21,100
Construction Surveying (1.5%)	COST	1.50%	$31,600.00	$31,600
Erosion Control (1%)	COST	1.00%	$21,100.00	$21,100
Mobilization (12%)	COST	12.00%	$252,200.00	$252,200
			PROJECTWIDE SUBTOTAL	**$494,100**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$778,500.00	$778,500
			PROJECTWIDE TOTAL	**$1,272,600**
Construction Engineering (9%)	COST	9.00%	$303,700.00	$303,700
Construction Contingencies (5%)	COST	5.00%	$168,700.00	$168,700
Engineering Design (10%)	COST	10.00%	$337,400.00	$337,400
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$809,800**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$349,800.00	$349,800

SUMMARY

ITEM TOTAL	**$2,100,900**
PROJECTWIDE TOTAL	**$1,272,600**
OTHER COST TOTAL	**$809,800**
ICAP	**$349,800**
TOTAL	**$4,540,000**

Bramble Drive Roundabout	MP	338.81	to MP	338.81
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	24,000	$8.00	$192,000
SAW CUTTING	L.FT.	160	$1.50	$300
EARTHWORK	L.SUM	1	$48,960.00	$49,000
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	33,383	$50.00	$1,669,200
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	25,900	$0.50	$13,000
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	4,115	$20.00	$82,300
CONCRETE CURB AND GUTTER	L.FT.	1,627	$15.00	$24,400
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	1,124	$60.00	$67,500
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$2,361,800**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$189,000.00	$189,000
Quality Control (1%)	COST	1.00%	$23,700.00	$23,700
Construction Surveying (1.5%)	COST	1.50%	$35,500.00	$35,500
Erosion Control (1%)	COST	1.00%	$23,700.00	$23,700
Mobilization (12%)	COST	12.00%	$283,500.00	$283,500
			PROJECTWIDE SUBTOTAL	**$555,400**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$875,200.00	$875,200
			PROJECTWIDE TOTAL	**$1,430,600**
Construction Engineering (9%)	COST	9.00%	$341,400.00	$341,400
Construction Contingencies (5%)	COST	5.00%	$189,700.00	$189,700
Engineering Design (10%)	COST	10.00%	$379,300.00	$379,300
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$910,400**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$393,200.00	$393,200

SUMMARY

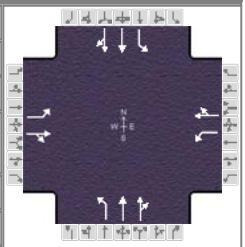
ITEM TOTAL	**$2,361,800**
PROJECTWIDE TOTAL	**$1,430,600**
OTHER COST TOTAL	**$910,400**
ICAP	**$393,200**
TOTAL	**$5,100,000**

APPENDIX WP2-3

2036 Capacity Analysis

HCS 2010 Signalized Intersection Results Summary

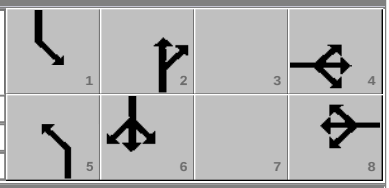
General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	AM Peak Hour - Build Condition	PHF	0.90
Urban Street	SR 89	Analysis Year	2036	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_AM_Build Condition.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	70	200	60	60	40	90	340	40	20	680	100

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	2.8	4.6	48.6	26.1	0.0	0.0
Yellow	4.0	0.0	4.0	4.0	0.0	0.0
Red	2.0	0.0	2.0	2.0	0.0	0.0



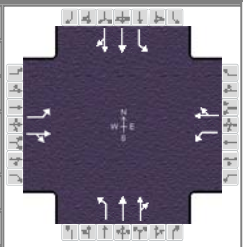
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	4.0	1.1	4.0
Phase Duration, s		32.1		32.1	13.3	59.1	8.8	54.6
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.5		4.5	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		18.5		24.4	7.5		2.6	
Green Extension Time (g_e), s		2.1		1.7	0.3	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	0.94		0.46	
Max Out Probability		0.03		0.20	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	78	300		67	111		100	214	208	22	443	423
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1277	1644		1075	1738		1774	1810	1743	1774	1810	1728
Queue Service Time (g_s), s	5.1	16.5		6.0	5.1		5.5	6.3	6.4	0.6	16.7	16.7
Cycle Queue Clearance Time (g_c), s	10.1	16.5		22.4	5.1		5.5	6.3	6.4	0.6	16.7	16.7
Green Ratio (*g/C*)	0.26	0.26		0.26	0.26		0.07	0.53	0.53	0.51	0.49	0.49
Capacity (*c*), veh/h	341	428		176	453		130	962	927	551	880	840
Volume-to-Capacity Ratio (*X*)	0.228	0.700		0.379	0.245		0.770	0.222	0.225	0.040	0.504	0.504
Back of Queue (*Q*), ft/ln (50 th percentile)	41.4	171.8		42.2	53.9		68.1	61.9	59.6	5.8	172.3	162.8
Back of Queue (*Q*), veh/ln (50 th percentile)	1.6	6.9		1.7	2.2		2.7	2.4	2.4	0.2	6.8	6.5
Queue Storage Ratio (*RQ*) (50 th percentile)	0.33	0.00		0.42	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	33.2	33.4		43.5	29.2		45.5	12.4	12.5	12.0	17.5	17.5
Incremental Delay (d_2), s/veh	0.3	2.6		1.3	0.3		9.2	0.5	0.6	0.0	2.1	2.2
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	33.5	36.1		44.9	29.5		54.7	13.0	13.0	12.1	19.5	19.6
Level of Service (LOS)	C	D		D	C		D	B	B	B	B	B
Approach Delay, s/veh / LOS	35.5	D		35.2	D		21.0	C		19.4	B	
Intersection Delay, s/veh / LOS	24.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.3	B	2.3	B
Bicycle LOS Score / LOS	1.1	A	0.8	A	0.9	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

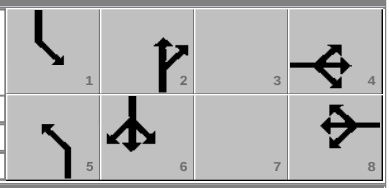
General Information				Intersection Information	
Agency	Burgess & Niple			Duration, h	0.25
Analyst	KMS	Analysis Date	May 6, 2016	Area Type	Other
Jurisdiction	ADOT/CYMPO	Time Period	PM Peak Hour - Build Condition	PHF	0.90
Urban Street	SR 89	Analysis Year	2036	Analysis Period	1> 7:00
Intersection	SR 89 and Road 3N	File Name	01_Road 3N_PM_Build Condition.xus		
Project Description	SR 89 Transportation Study				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	100	60	130	40	40	20	280	770	60	20	620	40

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

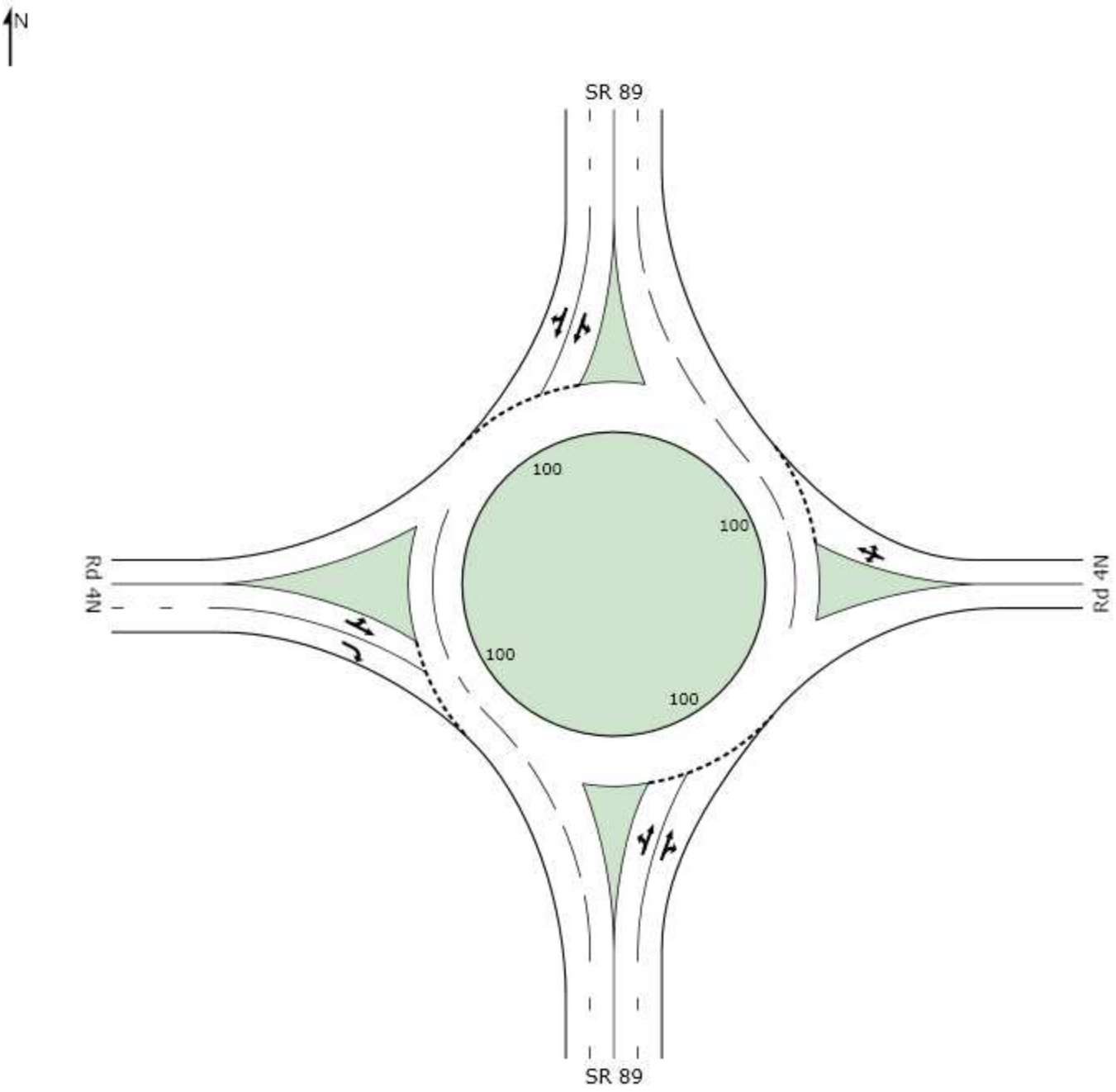
Green	2.8	11.1	43.9	18.2	0.0	0.0
Yellow	4.0	4.0	4.0	4.0	0.0	0.0
Red	2.0	2.0	2.0	2.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	5	2	1	6
Case Number		6.0		6.0	2.0	4.0	1.1	4.0
Phase Duration, s		24.2		24.2	25.9	67.0	8.8	49.9
Change Period, ($Y+R_c$), s		6.0		6.0	6.0	6.0	6.0	6.0
Max Allow Headway (*MAH*), s		4.4		4.4	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s		13.9		17.6	19.0		2.7	
Green Extension Time (g_e), s		1.0		0.6	0.9	0.0	0.0	0.0
Phase Call Probability		1.00		1.00	1.00		0.46	
Max Out Probability		0.35		1.00	0.00		0.04	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	111	211		44	67		311	467	455	22	370	363
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1329	1658		1166	1757		1774	1810	1763	1774	1810	1770
Queue Service Time (g_s), s	7.8	11.9		3.7	3.2		17.0	13.6	13.6	0.7	14.4	14.5
Cycle Queue Clearance Time (g_c), s	11.0	11.9		15.6	3.2		17.0	13.6	13.6	0.7	14.4	14.5
Green Ratio (*g/C*)	0.18	0.18		0.18	0.18		0.20	0.61	0.61	0.47	0.44	0.44
Capacity (*c*), veh/h	272	302		146	320		353	1104	1076	386	794	777
Volume-to-Capacity Ratio (*X*)	0.409	0.698		0.305	0.208		0.881	0.423	0.423	0.058	0.467	0.467
Back of Queue (*Q*), ft/ln (50 th percentile)	66.3	131.9		28.6	35.4		200.8	125.6	120.7	6.6	153.2	148.2
Back of Queue (*Q*), veh/ln (50 th percentile)	2.6	5.3		1.1	1.4		7.9	4.9	4.8	0.3	6.0	5.9
Queue Storage Ratio (*RQ*) (50 th percentile)	0.53	0.00		0.29	0.00		0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	39.4	38.3		45.6	34.8		38.9	10.2	10.2	14.4	19.8	19.8
Incremental Delay (d_2), s/veh	1.0	5.1		1.2	0.3		8.8	1.2	1.2	0.1	2.0	2.0
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	40.4	43.4		46.8	35.1		47.7	11.4	11.5	14.5	21.8	21.8
Level of Service (LOS)	D	D		D	D		D	B	B	B	C	C
Approach Delay, s/veh / LOS	42.4	D		39.8	D		20.6	C		21.6	C	
Intersection Delay, s/veh / LOS	24.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.8	C	2.8	C	2.2	B	2.3	B
Bicycle LOS Score / LOS	1.0	A	0.7	A	1.5	A	1.1	A


N
SR 89
Rd 4N
Rd 4N
SR 89
100
100
100
100

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N Build - AM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	33	3.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.87	27.1
8	T	422	5.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.42	30.4
18	R	22	3.0	0.232	5.7	LOS A	0.9	24.5	0.16	0.55	29.6
Approach		478	4.8	0.232	5.7	LOS A	0.9	24.5	0.16	0.46	30.1
East: Rd 4N											
1	L	44	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.86	27.0
6	T	22	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.59	30.0
16	R	22	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.65	29.5
Approach		89	3.0	0.115	5.8	LOS A	0.3	7.5	0.38	0.74	28.3
North: SR 89											
7	L	11	3.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.87	25.9
4	T	778	5.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.48	28.6
14	R	44	3.0	0.429	8.6	LOS A	2.2	56.3	0.32	0.58	28.0
Approach		833	4.9	0.429	8.6	LOS A	2.2	56.3	0.32	0.49	28.5
West: Rd 4N											
5	L	22	3.0	0.059	7.0	LOS A	0.2	3.9	0.50	0.90	26.5
2	T	11	3.0	0.059	7.0	LOS A	0.2	3.9	0.50	0.69	29.1
12	R	67	3.0	0.112	7.4	LOS A	0.3	7.2	0.49	0.75	28.5
Approach		100	3.0	0.112	7.2	LOS A	0.3	7.2	0.49	0.78	28.1
All Vehicles		1500	4.6	0.429	7.4	LOS A	2.2	56.3	0.28	0.52	28.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: SR 89 & Rd 4N Build - PM

SR 89 & Rd 4N
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	67	3.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.84	25.5
8	T	856	5.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.44	28.2
18	R	67	3.0	0.485	9.2	LOS A	2.8	71.8	0.26	0.55	27.6
Approach		989	4.7	0.485	9.2	LOS A	2.8	71.8	0.26	0.47	27.9
East: Rd 4N											
1	L	22	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.92	26.1
6	T	11	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.71	28.5
16	R	33	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.76	28.1
Approach		67	3.0	0.122	8.1	LOS A	0.3	7.9	0.53	0.81	27.4
North: SR 89											
7	L	22	3.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.87	26.5
4	T	600	5.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.47	29.4
14	R	22	3.0	0.331	7.2	LOS A	1.5	38.5	0.28	0.58	28.8
Approach		644	4.9	0.331	7.2	LOS A	1.5	38.5	0.28	0.49	29.3
West: Rd 4N											
5	L	22	3.0	0.050	6.0	LOS A	0.1	3.3	0.44	0.86	27.0
2	T	11	3.0	0.050	6.0	LOS A	0.1	3.3	0.44	0.62	29.8
12	R	44	3.0	0.065	6.0	LOS A	0.2	4.1	0.42	0.70	29.4
Approach		78	3.0	0.065	6.0	LOS A	0.2	4.1	0.43	0.74	28.6
All Vehicles		1778	4.6	0.485	8.3	LOS A	2.8	71.8	0.28	0.50	28.4

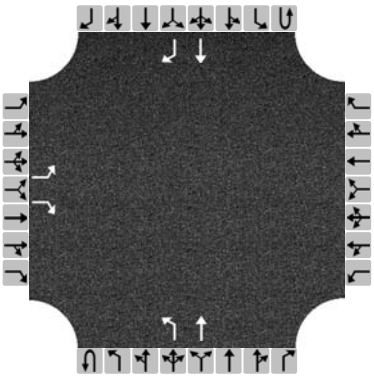
Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Rolling Hills Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Rolling Hills Road
Analysis Year	2036	North/South Street	SR 89
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		60						30	240				520	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

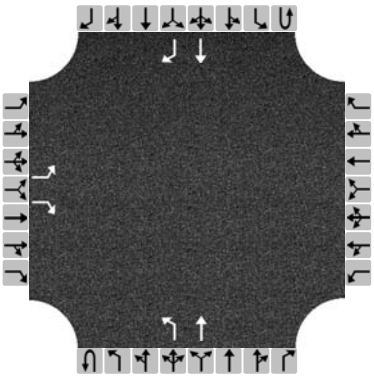
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		12		71						35						
Capacity		272		491						951						
v/c Ratio		0.04		0.14						0.04						
95% Queue Length		0.1		0.5						0.1						
Control Delay (s/veh)		18.9		13.6						8.9						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	14.3								1.0							
Approach LOS	B															

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	KMS	Intersection	SR 89 & Rolling Hills Rd
Agency/Co.	Burgess & Niple	Jurisdiction	ADOT/CYMPO
Date Performed	5/2016	East/West Street	Rolling Hills Road
Analysis Year	2036	North/South Street	SR 89
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	SR 89 Transportation Study		

Lanes



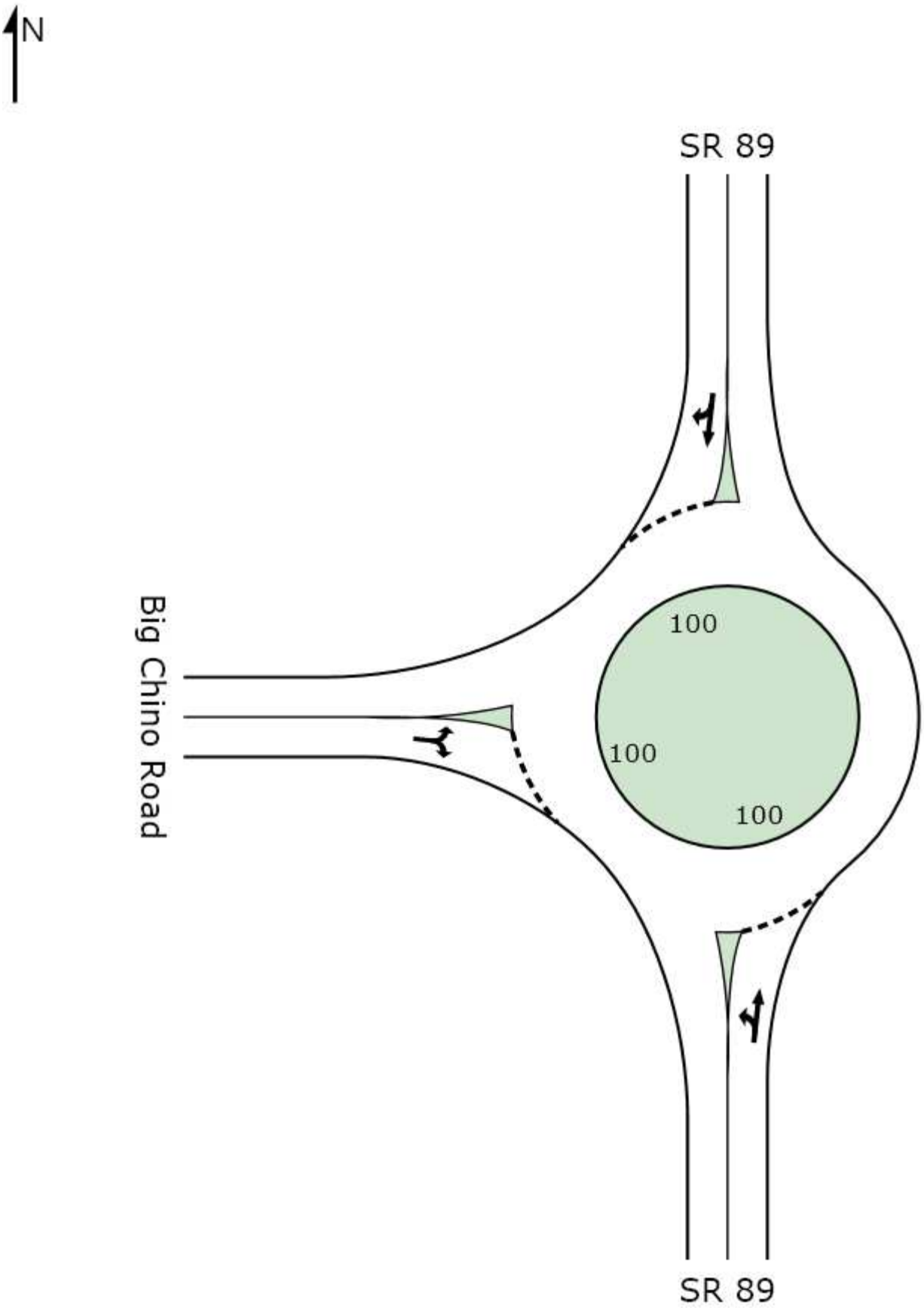
Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	1
Configuration		L		R						L	T				T	R
Volume (veh/h)		10		30						40	580				390	10
Percent Heavy Vehicles		3		3						3						
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		11		33						44						
Capacity		205		620						1110						
v/c Ratio		0.05		0.05						0.04						
95% Queue Length		0.2		0.2						0.1						
Control Delay (s/veh)		23.5		11.1						8.4						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	14.2								0.5							
Approach LOS	B															


N
SR 89
Big Chino Road
100
100
100
SR 89

MOVEMENT SUMMARY

SR 89 and Big Chino Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	76	3.0	0.253	5.8	LOS A	1.1	27.9	0.11	0.85	27.0
8	T	196	3.0	0.253	5.8	LOS A	1.1	27.9	0.11	0.40	30.3
Approach		272	3.0	0.253	5.8	LOS A	1.1	27.9	0.11	0.52	29.3
North: SR 89											
4	T	293	3.0	0.311	6.7	LOS A	1.4	35.9	0.24	0.45	29.7
14	R	22	3.0	0.311	6.7	LOS A	1.4	35.9	0.24	0.54	29.2
Approach		315	3.0	0.311	6.7	LOS A	1.4	35.9	0.24	0.46	29.7
West: Big Chino Road											
5	L	22	3.0	0.349	8.5	LOS A	1.5	38.1	0.48	0.86	25.9
12	R	261	3.0	0.349	8.5	LOS A	1.5	38.1	0.48	0.68	27.9
Approach		283	3.0	0.349	8.5	LOS A	1.5	38.1	0.48	0.69	27.8
All Vehicles		870	3.0	0.349	7.0	LOS A	1.5	38.1	0.28	0.56	28.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

SIDRA INTERSECTION

MOVEMENT SUMMARY

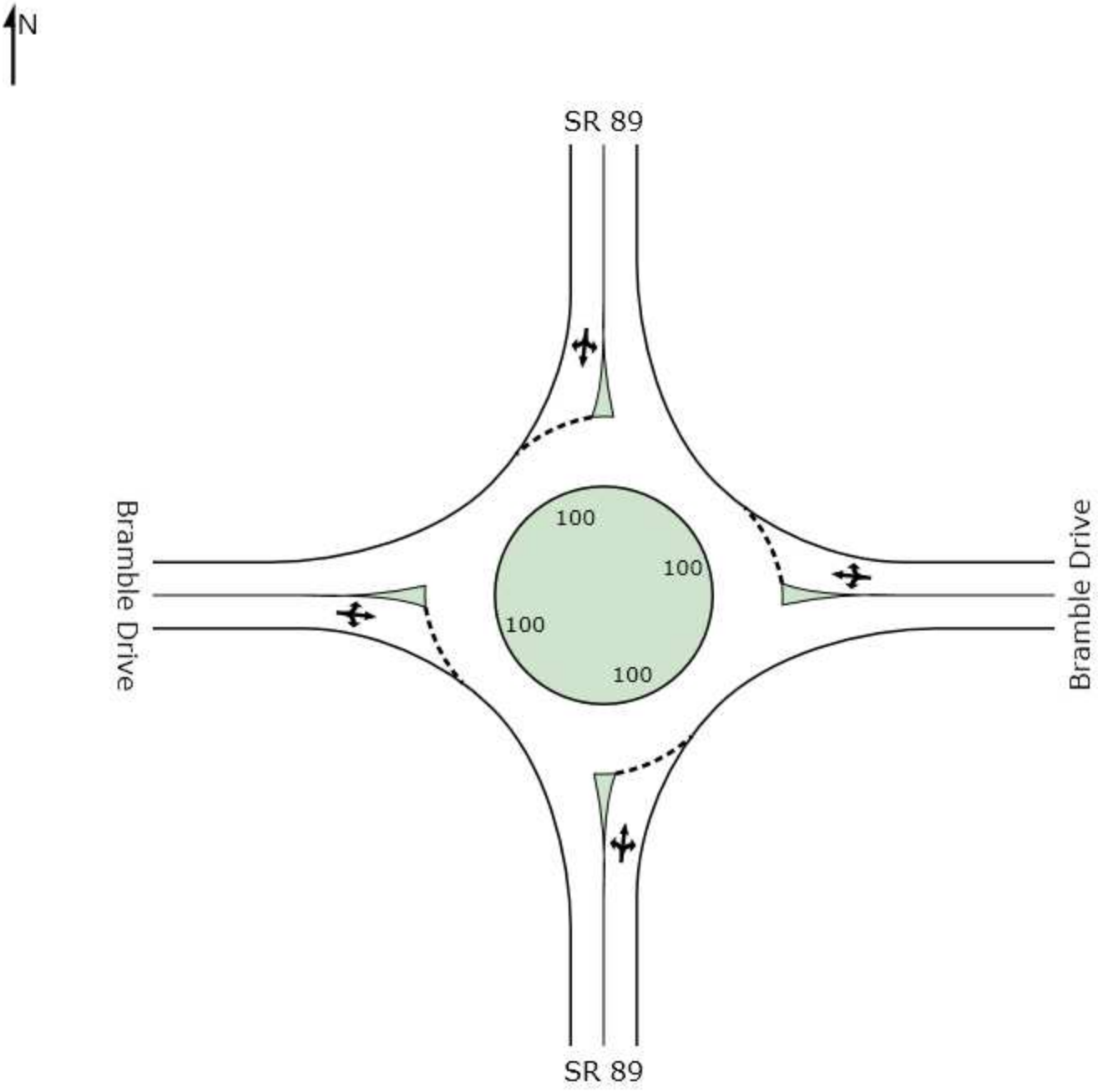
Site: SR 89 & Big Chino Road - Build - PM Peak Hour

SR 89 and Big Chino Road
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	272	3.0	0.574	10.7	LOS B	4.1	104.0	0.23	0.76	24.8
8	T	337	3.0	0.574	10.7	LOS B	4.1	104.0	0.23	0.40	27.2
Approach		609	3.0	0.574	10.7	LOS B	4.1	104.0	0.23	0.56	26.0
North: SR 89											
4	T	348	3.0	0.485	10.8	LOS B	2.5	64.4	0.54	0.68	27.3
14	R	54	3.0	0.485	10.8	LOS B	2.5	64.4	0.54	0.73	27.0
Approach		402	3.0	0.485	10.8	LOS B	2.5	64.4	0.54	0.69	27.2
West: Big Chino Road											
5	L	33	3.0	0.198	6.8	LOS A	0.7	18.7	0.46	0.85	26.6
12	R	120	3.0	0.198	6.8	LOS A	0.7	18.7	0.46	0.67	28.9
Approach		152	3.0	0.198	6.8	LOS A	0.7	18.7	0.46	0.71	28.3
All Vehicles		1163	3.0	0.574	10.2	LOS B	4.1	104.0	0.37	0.62	26.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.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SR 89

MOVEMENT SUMMARY

Site: SR 89 & Bramble Drive - Build - AM Peak Hour

SR 89 & Bramble Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	33	3.0	0.201	5.2	LOS A	0.8	20.8	0.08	0.89	27.3
8	T	174	3.0	0.201	5.2	LOS A	0.8	20.8	0.08	0.41	30.8
18	R	11	3.0	0.201	5.2	LOS A	0.8	20.8	0.08	0.51	30.1
Approach		217	3.0	0.201	5.2	LOS A	0.8	20.8	0.08	0.48	30.1
East: Bramble Drive											
1	L	11	3.0	0.026	4.3	LOS A	0.1	2.2	0.32	0.77	27.8
6	T	11	3.0	0.026	4.3	LOS A	0.1	2.2	0.32	0.46	31.1
16	R	1	3.0	0.026	4.3	LOS A	0.1	2.2	0.32	0.53	30.6
Approach		23	3.0	0.026	4.3	LOS A	0.1	2.2	0.32	0.61	29.4
North: SR 89											
7	L	1	3.0	0.086	4.2	LOS A	0.3	7.8	0.15	0.91	27.9
4	T	87	3.0	0.086	4.2	LOS A	0.3	7.8	0.15	0.43	31.4
14	R	1	3.0	0.086	4.2	LOS A	0.3	7.8	0.15	0.52	30.8
Approach		89	3.0	0.086	4.2	LOS A	0.3	7.8	0.15	0.44	31.4
West: Bramble Drive											
5	L	11	3.0	0.133	4.9	LOS A	0.5	12.5	0.23	0.79	27.5
2	T	1	3.0	0.133	4.9	LOS A	0.5	12.5	0.23	0.43	30.8
12	R	120	3.0	0.133	4.9	LOS A	0.5	12.5	0.23	0.51	30.2
Approach		132	3.0	0.133	4.9	LOS A	0.5	12.5	0.23	0.53	30.0
All Vehicles		461	3.0	0.201	4.9	LOS A	0.8	20.8	0.15	0.49	30.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

MOVEMENT SUMMARY

Site: SR 89 & Bramble Drive - Build - PM Peak Hour

SR 89 & Bramble Drive
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 89											
3	L	130	3.0	0.287	6.2	LOS A	1.3	32.8	0.14	0.79	26.8
8	T	152	3.0	0.287	6.2	LOS A	1.3	32.8	0.14	0.39	30.0
18	R	22	3.0	0.287	6.2	LOS A	1.3	32.8	0.14	0.48	29.4
Approach		304	3.0	0.287	6.2	LOS A	1.3	32.8	0.14	0.57	28.4
East: Bramble Drive											
1	L	11	3.0	0.016	4.6	LOS A	0.1	1.3	0.37	0.71	27.6
6	T	1	3.0	0.016	4.6	LOS A	0.1	1.3	0.37	0.47	30.7
16	R	1	3.0	0.016	4.6	LOS A	0.1	1.3	0.37	0.53	30.2
Approach		13	3.0	0.016	4.6	LOS A	0.1	1.3	0.37	0.67	28.0
North: SR 89											
7	L	11	3.0	0.379	8.0	LOS A	1.8	46.0	0.36	0.87	26.2
4	T	315	3.0	0.379	8.0	LOS A	1.8	46.0	0.36	0.52	28.9
14	R	33	3.0	0.379	8.0	LOS A	1.8	46.0	0.36	0.59	28.5
Approach		359	3.0	0.379	8.0	LOS A	1.8	46.0	0.36	0.53	28.8
West: Bramble Drive											
5	L	11	3.0	0.112	5.8	LOS A	0.4	9.9	0.42	0.85	27.2
2	T	11	3.0	0.112	5.8	LOS A	0.4	9.9	0.42	0.57	30.1
12	R	65	3.0	0.112	5.8	LOS A	0.4	9.9	0.42	0.63	29.6
Approach		87	3.0	0.112	5.8	LOS A	0.4	9.9	0.42	0.65	29.3
All Vehicles		763	3.0	0.379	7.0	LOS A	1.8	46.0	0.28	0.56	28.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Model used. Geometric Delay not included.

APPENDIX WP2-4

Crash Modification Factors

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 4576

Change left-turn phase to protected phasing on one or more approaches

Description: Change from permissive, permissive/protected, or protected/permissive to protected phasing on one or more approaches at urban signalized intersection

Prior Condition: Permissive, permissive/protected, or protected/permissive phasing.

Category: Intersection traffic control

Study: *Highway Safety Manual, 1st Edition*, Various, 2010

Star Quality Rating:	★★★★★

Crash Modification Factor (CMF)	
Value:	0.01
Adjusted Standard Error:	
Unadjusted Standard Error:	0.01

Crash Reduction Factor (CRF)	
Value:	99 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	1

Applicability	
Crash Type:	Left turn
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Signalized

Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	
Date Added to Clearinghouse:	
Comments:	Crash type is for left-turn crashes on treated approaches.

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

CMF / CRF Details

CMF ID: 4194

Conversion of signalized intersection into single- or multi-lane roundabout

Description:

Prior Condition: Signalized intersection

Category: Intersection geometry

Study: *Safety Effectiveness of Converting Signalized Intersections to Roundabouts*, Gross et al., 2012

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.81
Adjusted Standard Error:	
Unadjusted Standard Error:	0.06

Crash Reduction Factor (CRF)

Value:	19 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	6

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	2
Road Division Type:	
Speed Limit:	15-35 mph
Area Type:	Urban and suburban
Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Roundabout
Major Road Traffic Volume:	5300 to 52500 Annual Average Daily Traffic (AADT)

Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2000 to 2009
Municipality:	
State:	CO, FL, IN, MD, MI, NY, NC, SC, VT, WA
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Sites
Before Sample Size Used:	16 Sites
After Sample Size Used:	16 Sites

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	Conversion to 2-lane roundabout

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CMF / CRF Details

CMF ID: 4695

Convert high-speed rural intersection to roundabout

Description: Convert high-speed rural intersection to roundabout

Prior Condition: Stop controlled intersection (3 or 4 leg)

Category: Intersection geometry

Study: *A Statistical Analysis and Development of a Crash Prediction Model for Roundabouts on High-Speed Rural Roadways*, Isebrands, 2012

Star Quality Rating:	[View score details]

Crash Modification Factor (CMF)	
Value:	0.33
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)

Value:	67 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	1 to 2
Road Division Type:	
Speed Limit:	40-65 mph
Area Type:	Rural
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Roundabout
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	
Municipality:	
State:	KS, MD, MN, OR, WA, WI
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Site-years
Before Sample Size Used:	98 Site-years
After Sample Size Used:	98 Site-years

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 285

Provide a right-turn lane on one major-road approach

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection geometry

Study: ***Safety Effectiveness of Intersection Left- and Right-Turn Lanes*****, Harwood et al., 2002**

Star Quality Rating:	★★★★☆

Crash Modification Factor (CMF)	
Value:	0.86
Adjusted Standard Error:	0.06
Unadjusted Standard Error:	0.05

Crash Reduction Factor (CRF)

Value:	14 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	6
Unadjusted Standard Error:	5

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	1500 to 40600 Average Daily Traffic (ADT)

Minor Road Traffic Volume:	25 to 26000 Average Daily Traffic (ADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	Yes. HSM lists this CMF in **bold** font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
Date Added to Clearinghouse:	
Comments:	Countermeasure name changed to match HSM

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CMF / CRF Details

CMF ID: 7774

Install lighting

Description:

Prior Condition: Roadways without street lighting

Category: Highway lighting

Study: ***Validation and Application of Highway Safety Manual (Part D) in Florida*, Abdel-Aty et al., 2014**

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.63
Adjusted Standard Error:	
Unadjusted Standard Error:	0.12

Crash Reduction Factor (CRF)

Value:	37 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	12

Applicability

Crash Type:	All
Crash Severity:	Fatal,Serious injury,Minor injury
Roadway Types:	All
Number of Lanes:	
Road Division Type:	All
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	Night

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2006 to 2010
Municipality:	
State:	FL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Mar-08-2016
Comments:	CMFs of adding lighting on all roads types with all number of lanes.

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CMF / CRF Details

CMF ID: 7775

Install lighting

Description:

Prior Condition: Roadways without street lighting

Category: Highway lighting

Study: ***Validation and Application of Highway Safety Manual (Part D) in Florida*, Abdel-Aty et al., 2014**

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.84
Adjusted Standard Error:	
Unadjusted Standard Error:	0.18

Crash Reduction Factor (CRF)

Value:	16 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	18

Applicability

Crash Type:	All
Crash Severity:	Property damage only (PDO)
Roadway Types:	All
Number of Lanes:	
Road Division Type:	All
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	Night

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2006 to 2010
Municipality:	
State:	FL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Mar-08-2016
Comments:	CMFs of adding lighting on all roads types with all number of lanes.

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CMF / CRF Details

CMF ID: 2514

Replace TWLTL with raised median

Description:

Prior Condition: Two way left turn lane (TWLTL)

Category: Access management

Study: *Modeling and Evaluating the Safety Impacts of Access Management (AM) Features in the Las Vegas Valley*, Mauga and Kaseko, 2010

Star Quality Rating:	★★★☆☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.77
Adjusted Standard Error:	
Unadjusted Standard Error:	0.0616

Crash Reduction Factor (CRF)

Value:	23 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	6.16

Applicability

Crash Type:	Angle,Fixed object,Head on,Rear end,Run off road,Sideswipe,Single vehicle
Crash Severity:	All
Roadway Types:	All
Number of Lanes:	
Road Division Type:	All
Speed Limit:	30-45
Area Type:	Urban
Traffic Volume:	4883 to 96080
Time of Day:	Not specified

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	

Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2002 to 2006
Municipality:	
State:	NV
Country:	
Type of Methodology Used:	Regression cross-section
Sample Size Used:	Crashes

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

CMF / CRF Details

CMF ID: 7569

Convert 2 lane roadway to 4 lane divided roadway

Description: Conversion of urban and rural two-lane roadways to four-lane divided roadways

Prior Condition: 2 lane roadway

Category: Roadway

Study: *Evaluation of the Safety Effectiveness of the Conversion of Two-Lane Roadways to Four-Lane Divided Roadways: Bayesian vs. Empirical Bayes*, Ahmed et al., 2015

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.712
Adjusted Standard Error:	
Unadjusted Standard Error:	0.076

Crash Reduction Factor (CRF)	
Value:	28.79 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	7.65

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	2
Road Division Type:	Undivided
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	

Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2002 to 2012
Municipality:	
State:	FL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

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APPENDIX WP2-5

Public Involvement Summary

State Route 89 Chino Valley to Forest Boundary Transportation Study

(Perkinsville Road to two miles north of Bramble Drive in Paulden)

February 2017

Prepared by
Arizona Department of Transportation
206 S. 17th Ave.
Phoenix, AZ 85007

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4.0 Appendix 6

Stakeholder Outreach Plan

Meeting notifications, newspaper ad and mailer/postcard

Title VI reports and public meeting summaries for each meeting, including written comments received at the meeting, sign-in sheets

Media clips about the study

1.0 Introduction

The Arizona Department of Transportation (ADOT) in association with the Central Yavapai Metropolitan Planning Organization (CYMPO), Yavapai County, the Town of Chino Valley, and Federal Highway Administration (FHWA), issued a study to develop a vision for safety and performance improvements on a 13-mile segment of State Route 89 between Perkinsville Road in Chino Valley to two miles north of Bramble Drive in Paulden.

In order to improve safety and operational efficiency along SR 89, the study's purpose was to identify access, mobility, safety and expansion needs for the corridor. The recommendations were then prioritized for the short-term (five-year), mid-term (ten-year) and long-term (twenty-year) time periods.

The study began in May of 2016 and was complete by March 2017. Extensive outreach was done throughout the study. Initially, a public outreach plan was prepared and followed throughout the study process.
Study outreach included the following:

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3,881 stakeholders was sent out on 1-4-17 as a reminder of the four scheduled meetings
- Study webpage was created: azdot.gov/pauldenstudy
- Information through the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley, Urgent Care in Chino Valley

2.0 Public Information Meetings

ADOT held four meetings to provide study information and answer questions with the general public. The four outreach meetings were held on Thursday, Jan. 5 at the Paulden Christian Fellowship Church at 165 Aspen Road, Paulden, AZ 86334; Tuesday, Jan. 10 at council chambers at the Town of Chino Valley, 202 N. SR 89, Chino Valley, AZ 86332; Wednesday, Feb. 1 at the Yavapai County Board of Supervisors meeting, 1015 Fair Street, Prescott, AZ 86305 and Wednesday, Feb. 15 at the Central Yavapai Metropolitan Planning Organization (CYMPO) board meeting at 1015 Fair Street, Prescott, AZ 86305. The biggest attendance was at the first meeting in Paulden at the PACO meeting. A full summary of each of the meetings is detailed in the Title VI report.

2.1 Outreach

The study team prepared an extensive outreach schedule to ensure all Title VI requirements were met and that proper notifications were provided for the upcoming meetings.

The study mailer was mailed out on Dec. 1 to 2,500 addresses within a ¼ mile radius along the study corridor. This flier introduced the study and invited residents and businesses to attend one of the upcoming public information meetings.

2.2 Notifications

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3,881 stakeholders on January 4, 2017
- Project webpage was created: azdot.gov/pauldenstudy
- Study and meeting notifications were hand-delivered in Paulden and Chino Valley. Locations include the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley, Urgent Care, Pharmacy, ShopCo and Ace Valley hardware
- Local media outlets covered the meeting announcements such as the Daily Courier, KYCA AM 1490, Yavapai Broadcasting and eNews of Prescott/Chino Valley
- The Daily Courier and Chino Valley Review announced the meetings on January 5, 2017
- The Chino Valley Review and the Daily Courier ran a follow up story on January 11, 2017 about the Paulden meeting

2.3 Outreach Meetings

The purpose of the four meetings was to inform the local community about the transportation study. The intent behind each of the four meetings was to partner with the local jurisdictions (CYMPO, the Town of Chino Valley and Yavapai County) who were also working along-side ADOT during the study. Feedback was encouraged to help offer suggestions for necessary improvements that address safety, access, mobility, and capacity issues.

2.4 Title VI

Title VI information was presented at the beginning of the slide show. Mentions were made of information and survey cards that were made available at each meeting (photos attached). This included an English and Spanish brochure as well as self-identification surveys. A Title VI Summary was prepared for each the four meetings (attached).

3.0 Public Comment Summary

Written questions and concerns were presented and addressed during each meeting. Many concerns were from residents who want to see intersection improvements throughout the corridor, some were of the lack of acceptance of roundabouts and other comments were made about the timing for the widening of SR 89.

Written comments received during the meetings are located as part of the documents received from each meeting. Each meeting has a public meeting summary, Title VI summary, written comments (if received) and sign-in sheets.

Comments were classified into the following categories:

- Roundabouts & Locations
- Timing of widening project/s
- Concern for need for turn lanes along the corridor
- Safety concerns
- Concern for wildlife corridors

3.1 Summary of Comments

- Roundabouts and Location
    - Many questions were about roundabout locations and why couldn't a signal be placed instead?
    - Roundabouts are not safe, signals are better
    - Where will the new roundabouts be located
    - Some of the public expressed operational concerns with roundabouts, but most appeared to accept the safety benefits after receiving explanation from the Study Team

- Timing of widening project
    - ADOT was informative and up front about the lack of current funding for this study
    - ADOT reminded the public that this is a high-level planning study
    - ADOT would look at doing a few improvement projects now, based on the need and dependent upon funding availability
- Concerns for turn-lanes along the corridor
    - Many residents voiced concerns for the need for turn lanes at Buffalo Run and South end of Old Hwy 89 and at Little Ranch Road
- Wildlife Corridors
    - A few people were vocal about the desire for wildlife corridors to help with keeping the antelope population strong

APPENDIX

Stakeholder outreach plan

Meeting notifications: Newspaper ad, postcard/mailer

Title VI reports and summaries for each meeting

Written comments

Sign-in sheets

Media clips

SR89 Chino Valley to Forest Boundary Transportation Study
Public and Stakeholder Outreach Plan

Task	Responsible Parties	Description	Start	Finish
Create / Update Study Website	Tricia / Jason	-Jason to provide Tricia with approved deliverables (content). -Tricia to work with WebTeam to create/update.	May 2016	February 2017
Study Notification	Tricia / Core Study Team	-Tricia to provide notification to direct interested public/ stakeholders to the Study Website and sign up for the GovDelivery study email list. -Core Study Team to review message.	September 2016	February 2017
Public / Stakeholder Review of Draft Alternatives and Access Management	Tricia / Core Study Team	-Tricia to prepare Newspaper Ads and GovDelivery email blasts to notify public/stakeholders to review the draft alternatives, draft access management plan, and notify of upcoming meetings. -Core Study Team to review ad/email messages.	September 2016	December 2016
Draft Alternatives and Access Management Plan Presentations	Jason / Tricia / District / Dan	-Jason to provide draft Plan of Improvements (Working Paper 2). -Tricia to prepare presentation. -District and Dan to present to PACO, County Board, and Chino Council. -Tricia to document public feedback.	October 2016	December 2016
Public/Stakeholder Outreach Summary Report	Tricia / Core Study Team	-Tricia to prepare a Public/ Stakeholder Outreach Summary Report based on input received. -Core Study Team to review.	January 2017	March 2017
Draft/Final Report Outreach	Dan / Tricia / Core Study Team	-Dan to prepare email blast when the Draft Report (for review) and Final Report (for record) are available. -Core Study Team to review message. -Tricia to distribute to Stakeholder list.	February 2017	March 2017

Prescott Newspapers, Inc.

1958 Commerce Center Circle
Prescott, AZ 86301
(928) 445-3333
jwalther@prescottaz.com
www.westernnews.com
(928) 445-4756 fax

Invoice No.	Quote
Invoice Date:	October 27, 2016
Bill To:	ADOT
	Tricia Lewis
Address:	
Phone:	928-606-2420
E-mail:	Tlewis@azdot.gov
Fax:	

Description	Units	Cost Per Unit	Amount
Quarter page ad in the Chino Valley Review	63.00	$ 9.37	$ 590.31
7-Dec-16			
21-Dec-16			

Invoice Subtotal	$ 590.31
Tax Rate	2.00%
Sales Tax	11.81
Other	
Credit Card Payment Received	
TOTAL	**$602.12**

Make all checks payable to Prescott Newspapers Inc.
Total due upon receipt. Overdue accounts subject to a service charge of 2% per month.

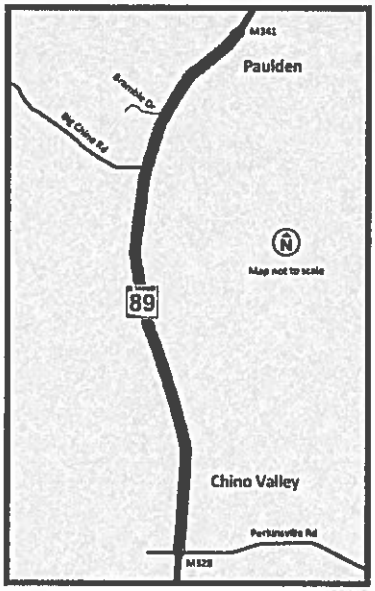
Thank you for your business!

ARIZONA 89

SR 89 Chino Valley to Forest Boundary Transportation Study

Perkinsville Road to two miles north of Bramble Drive in Paulden

The Arizona Department of Transportation is studying a 13-mile segment of State Route 89, between Perkinsville in Chino Valley and two miles north of Bramble Drive in Paulden. The purpose of this long-range planning study is to help identify future roadway improvements as funding becomes available.



Your input is needed! You can learn more about the study and provide comments at the following meetings:

- **Paulden Area Community Organization (PACO):** 7 p.m. Thursday, Jan. 5, 2017, at the Paulden Christian Fellowship Church, 165 Aspen Road, Paulden 86334
- **Town of Chino Valley Council Meeting:** 6 p.m. Tuesday, Jan. 10, at council chambers, 202 N. State Route 89, Chino Valley, 86332
- **Yavapai County Board of Supervisors Meeting:** 9 a.m. Wednesday, Feb. 1, 1015 Fair Street, Prescott, 86305
- **Central Yavapai Metropolitan Planning Organization (CYMPO) Board Meeting:** 4 p.m., Wednesday, Feb. 15, at 1015 Fair Street, Prescott, 86305

(Note: Each meeting will cover the same information)

For additional study details, or to sign up to receive study emails, please visit:

azdot.gov/PauldenStudy

Pursuant to Title VI of the Civil Rights Act of 1964, and the Americans with Disabilities Act (ADA), ADOT does not discriminate on the basis of race, color, national origin, age, sex or disability. Persons who require a reasonable accommodation based on language or disability should contact Tricia Lewis at 928.606.2420 or email TLewis@azdot.gov. Requests should be made as early as possible to ensure the state has an opportunity to address the accommodation.

De acuerdo con el título VI de la Ley de Derechos Civiles de 1964 y la Ley de Estadounidenses con Discapacidades (ADA por sus siglas en inglés), el Departamento de Transporte de Arizona (ADOT por sus siglas en inglés) no discrimina por raza, color, nacionalidad, edad, género o discapacidad. Personas que requieren asistencia (dentro de lo razonable) ya sea por el idioma o por discapacidad deben ponerse en contacto con Tricia Lewis al 928.606.2420 o por correo electrónico al TLewis@azdot.gov. Las solicitudes deben hacerse lo más pronto posible para asegurar que el equipo encargado del proyecto tenga la oportunidad de hacer los arreglos necesarios.

ADOT

FOR MORE INFORMATION, CONTACT:
Tricia Lewis, senior community relations officer,
ADOT Northwest District
TLewis@azdot.gov or **928.606.2420**

Appendix A – Study Mailer

SR 89 Chino Valley to Forest Boundary Transportation Study
Perkinsville Road to two miles north of Bramble Drive in Paulden

The Arizona Department of Transportation is studying a 13-mile segment of State Route 89, between Perkinsville in Chino Valley and two miles north of Bramble Drive in Paulden. The purpose of this long-range planning study is to help identify future roadway improvements as funding becomes available.

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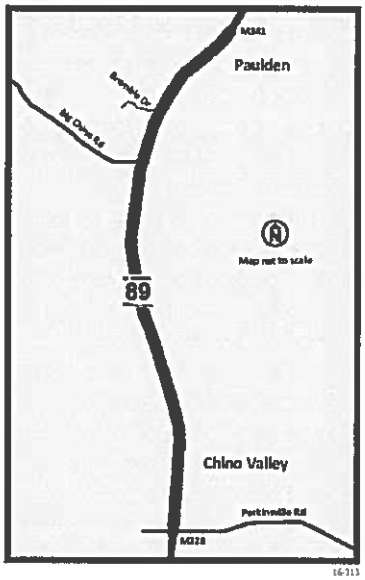
(Note: Each meeting will cover the same information)

For additional study details, or to sign up to receive study emails, please visit our website at:
azdot.gov/PauldenStudy



16-313

ADOT

FOR MORE INFORMATION, CONTACT:
Tricia Lewis, senior community relations officer, ADOT Northwest District
TLewis@azdot.gov or 928.606.2420

16-313 Postcard SR 89 Paulden Study.indd 1 11/18/2016 11:35:45 AM

ADOT

ADOT Communications
1655 W. Jackson St., MD 126F
Phoenix, AZ 85007

Your input is needed! SR 89 Chino Valley to Forest Boundary Transportation Study

Pursuant to Title VI of the Civil Rights Act of 1964, and the Americans with Disabilities Act (ADA), ADOT does not discriminate on the basis of race, color, national origin, age, sex or disability. Persons who require a reasonable accommodation based on language or disability should contact Tricia Lewis at 928.606.2420 or email TLewis@azdot.gov. Requests should be made as early as possible to ensure the state has an opportunity to address the accommodation.

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16-313 Postcard SR 89 Paulden Study.indd 2 11/18/2016 11:35:45 AM

State Route 89 Chino Valley to Forest Boundary Transportation Study
Road 3 North to two miles north of Bramble Drive in Paulden

The Arizona Department of Transportation is studying a 13-mile segment of State Route 89, between Road 3 North in Chino Valley and two miles north of Bramble Drive in Paulden. **The purpose of this long-range planning study is to help identify future roadway improvements as funding becomes available.**

Your input is needed! You can learn more about the study and provide comments at the following meetings:

- Paulden Area Community Organization (PACO): 7 p.m., Thursday, Jan. 5, at the Paulden Christian Fellowship Church, 165 Aspen Road, Paulden 86334
- Town of Chino Valley Council Meeting: 6 p.m., Tuesday, Jan. 10, at council chambers, 202 N. State Route 89, Chino Valley, 86332
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(Note: Each meeting will cover the same information)

For additional study details, or to sign up to receive study emails, please visit our website at: www.azdot.gov/Pauldenstudy

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CONTACT: Tricia Lewis, senior community relations officer
ADOT-Northwest District
928-606-2420 or tlewis@azdot.gov

State Route 89 Chino Valley to Forest Boundary Transportation Study
Road 3 North to two miles north of Bramble Drive in Paulden

Public Information Meeting Overview –
Paulden Area Community Organization (PACO) Paulden Meeting

TRACS: P8600 70P

Overview

Project:	State Route 89 Chino Valley to Forest Boundary Transportation Study Road 3 North to two miles north of Bramble Drive in Paulden
Meeting Type:	Public Information Meeting – Part of the PACO monthly meeting
Intention:	To introduce the transportation study to the local area, including residents and business owners. Explain the need, timeframe and intent behind the study.

Meeting Date and Location

Date/Time:	Thursday, Jan. 5, 2017 | 7 p.m. to 9 p.m.
Location:	Paulden Christian Fellowship Church | 165 Aspen Rd. Paulden, 86334
Intention:	To engage the local community in a study that would eventually impact them greatly. To explain and highlight the areas ADOT feels need attention along the corridor. ADOT wants to explain how this study identifies several necessary improvements to address safety, access, mobility, and capacity issues.

Public Meeting

Format and Meeting Site Layout

Format: The Office of Community Relations coordinated with the local community organization (PACO) at a monthly meeting which actually consumed the entire agenda. Tricia Lewis reserved the site and worked with the PACO president several months prior to the meeting. The meeting site layout was rows of chairs with a podium at the front of the room. Alvin Stump, the NW District Engineer did a presentation/slide show and then opened up the meeting to questions and answer session.

Meeting layout

- Chairs: 100 set up theater style with podium and head table at the front of the room
- Tables: No tables were set up, there was not room for tables in the small venue (church)
    - Registration and Title VI – setup in the front of the room (photos provided)
- A/V: One microphone
- Sign-in/orientation
    - Materials: Sign-in sheets; Title VI information was provided and mentioned during beginning of presentation

Presentation:

The PACO meeting had a small agenda prior to opening the floor up to ADOT. At approximately 7:15, Tricia Lewis and Alvin Stump stood up and did introductions of the team that was present: Tricia Lewis, senior community relations office, Alvin Stump, NW district engineer, Dan Gabiou, MPD project manager, Andy Roth, NW assistant district engineer. Alvin began with the study overview but before the presentation got into detail, he highlighted the Title VI materials. A detailed slide show was presented and then a Q&A session (that included 26 questions). Alvin answered all the questions during the meeting.

- Presented by Tricia Lewis (welcome, introduction of study team, purpose of the meeting and Title VI information)
- Presented by Alvin Stump (study overview)

Questions:

- Written comments/questions were answered during the presentation
- Open house style after presentation
- Q&A discussion with project members after the presentation and written questions were answered

Meeting Schedule:

7:00 p.m.: Set-up (Communications, Project Team)

- Registration table
- Screen at the front of the room, A/V equipment provided

7:15 p.m. – Meeting began with PACO agenda, interaction with project team members

Answered written questions once presentation was done

9 p.m. – The church started to clear about 9:15 and meeting was complete

Notifications:

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21 (both Wednesday since that is production day)
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3881 stakeholders
- Project webpage was created: azdot.gov/pauldenstudy
- Information through the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley

Contact information for collateral:

Email: tlewis@azdot.gov

Phone: 928.606.2420

Tricia Lewis

From: Daniel Gabiou
Sent: Friday, January 13, 2017 2:04 PM
To: Tricia Lewis; Jason Pagnard
Subject: SR89 Public Comments Summary

Paulden Meeting Comments (1/5/17)

Comments	Respo nses
1) Why 4 lanes when Hell Canyon is 2 lanes?	Traffic volumes are lower at Hell Canyon. We'll only be looking at a passing lane further north.
2) Hope to see these turns in the near future.	
3) Why build a 16' wide median at Big Chino? How would a roundabout work there?	The roundabout would be ideal at this location. We need 16' width in order to add a median and turn-lane.
4) The section between Chino and Paulden is dangerous. Any improvements are appreciated.	
5) You should lower the speed limit to 55 all the way to Chino.	The assigned speed limit is based on most people's comfort level.
6) There are people passing on the right in the emergency areas (shoulders).	
7) There should be an additional paved road connecting Paulden to Chino.	Any work off of SR89 would be a County project.
8) At roundabouts, can the yield signs be converted to stop signs?	No, this would defeat the purpose of the roundabout.
9) If Phoenix has 30% of the population, do they get all the money [for transportation improvements]?	Phoenix has their own pot of money. Safety funds are something we compete for statewide.
10) Thanks for Little Ranch Rd; roundabouts are great.	
11) We should do a merging ramp instead of a lights or roundabouts.	
12) What are we doing at the railroad? There's not a lot of width there. Would you widen to 4 lanes, then squeeze back down to 2 lanes? What if people race to pass and hit the abutments?	Any widening of the Railroad overpass bridge would require significant costs. Adding the median helps to slow people down.
13) We need alternative transportation routes such as bike routes and sidewalks. Will cattle guards be removed?	Rd 3 N to Rd 5 N will include sidewalks. In rural areas, we'll have shoulder for bikes. At intersections it would be case by case. Cattle guards can be replaced when fencing is available.
14) You should just add a passing lane; not expand lanes. 4 Lanes open up development. Passing lanes are cheaper.	
15) When are we repaving? We don't need roundabouts; we need to preserve what we have.	
16) What's the total cost?	$50M - $60M range.
17) I like roundabouts. Put one at Big Chino.	
18) We need school bus pullouts.	
19) Why include access points at Frontier instead of Buffalo Run?	

20) Why no Left Turn lanes with construction at Little Ranch Rd? When will access to Little Ranch Rd be repaired?	We used Bridge Program funds for that project. Bridge funds have to be used for bridges, so we could add turn lanes at that time. We'll try to get maintenance funds and patch the potholes.
21) No traffic circle at Big Chino, but lighting is needed.	Roundabouts reduce conflicts points from 32 to 8 and reduce fatalities by over 90%.
22) Little Ranch Rd is very dangerous. Need Left Turn lane.	
23) Can we have a "No Passing" at Little Ranch Rd?	No passing is tied to sight distance.
24) Need a traffic signal at Big Chino and Bramble.	
25) Will Sedona take money away from the Northwest District?	All construction funds are competitive statewide.
26) What's more expensive, a signal or a roundabout?	It depends on the intersection. A 2-lane roundabout could be as cheap as $1.5M - $2M.
27) No more roundabouts. 18 wheelers don't fit. There are black marks in the roundabouts from where the trucks drive over them.	The aprons are intended for trucks to drive over them when they drive in the inner lane.
28) Can we get street lights?	Hopefully as part of the Paulden turn lane project.
29) Is it more economical to do yellow striping [instead of adding a raised median]?	It's a safety problem. Adding a median prevents crossover accidents.
30) You should clear the area near Little Ranch Rd to improve visibility.	
31) Thanks for lowering the speed limit.	
32) Roundabouts won't fix driver behavior. They'll still pass on the right in the shoulder when the buses are stopped.	We'll take bus stops into consideration.
33) What will the impacts be to the RV Park and Post Office?	We are close to having a couple of options that we will share with the businesses. Once we get them developed, we will meet with the businesses. As it stands, all improvements will be inside the right-of-way.

Chino Valley Meeting Comments (1/10/17)

Comments	**Respo nses**
1) Will there be a roundabout at Rd 5 N?	We're looking at the possibility, but it's currently unfunded
2) Does ADOT pave/maintain local roads in Paulden?	No, the town and county are responsible for maintaining local roads.
3) How does prioritization work for safety? There are a lot of accidents between Chino and Paulden.	We apply for federal funds. It's prioritized based on a benefit to cost calculation.
4) How wide is the current corridor?	Most of the corridor is 200', except it gets narrower in Paulden. This study is not looking at adding a new alignment. In the long term, we may have a parallel system, but that would be very far out.
5) Why roundabouts? We had them in a long time ago and took them out because they didn't work.	Back in the day we used traffic circles, but we took them out because they created more accidents. We're proposing roundabouts now. Roundabouts reduce the contact points from 32 to 8. Modern roundabouts have different design, eliminate serious accidents, and are more efficient.
6) Big Chino wash is very sensitive environmentally.	
7) There is a bald eagle nest near Rd 6 N. It's a very	As part of any future projects, we will complete a NEPA

sensitive area. We lost 3 eagle eggs due to loud noises in the area.	process and coordinate with AGFD and USFWS and incorporate any mitigation measures to reduce impacts to the eagles.
8) We need a wildlife crossing near Paulden.	

Dan Gabiou, CPM
Planning Program Manager
ADOT Multimodal Planning Division
206 S. 17th Avenue, MD310B
Phoenix, AZ 85007
602-712-7025
azdot.gov

ADOT
Multimodal Planning

TITLE VI MEETING SUMMARY for:

The State Route 89 Chino Valley to Forest Boundary Transportation Study Road 3 North to two miles north of Bramble Drive in Paulden

TO: Lucy Schrader

FROM: Tricia Lewis

DATE: January 9, 2017

Public Information Meeting:
Thursday, Jan. 5, 2017 at 7 p.m., at the Paulden Area Community Organization (PACO) monthly meeting located at the Paulden Christian Fellowship Church in Paulden. (Three more meetings are scheduled for this same study).

Total attendees that signed in at the meeting: 71 people attended the first outreach meeting in Paulden.

Accommodation Requests: None received for this meeting.

Accommodations Made: Church was relatively located in the center of Paulden area and was well-known and attended by local residents and business owners.

Self-Identification Surveys Returned: 2

Note: attach a copy of any advertisements and mailers that were used to publicize this meeting as well as a photo of the display. This cover sheet will become an appendix to the final meeting summary.

- Two print ads were placed for notification of the upcoming outreach schedule and were in the Chino Valley Review on Dec. 7 and again on Dec. 21.

PAULDEN AREA COMMUNITY ORGANIZATION
GENERAL MEETING SIGN-IN
DATE: January 5, 2017

BOARD MEMBERS - PLEASE INITIAL NEXT TO YOUR NAME

Betsy Terry	BT
Dave Chrazanowski	DC
Don Nowell	DN
Gary Hanby	GH
Gin Sullivan	
James Haley	JH
Judi Lewis	JL
Terri McPherson	TM
Tom Martens	TM

MEMBERS AND GUESTS - PLEASE PRINT

NAME	ADDRESS	EMAIL
NEVLS	N FEATHER MTN	@N FILE
MARK + Theresa Logan	N Feather Mtn	theresl@live.com
Bonnie Kuhlman	Saddle Rd.	Neel.Bonnie@gmail.com
Karen Nu	SAUFRANSICO	
Blackhawk	Paulden, AZ	
Gary / Carol Hanby	PAULDEN, AZ	
John / Angel Benson	Paulden AZ	
Cathy Schultz	Paulden AZ	[illegible]
Wes Lusher	Annie Rd	wlusher122gmail.com
Oliver Thomas	Big Springs	"
Mitchell Peterson	N. Mitchell Lane	Mitchell.Peterson JR@[illegible]

NAME	ADDRESS	EMAIL
Matthew Peterson	Mitchell Lane	Matthew81388@Gmail
Craig Brown	YAV. Co	
SHIRLEY WOOD	YAVAPAI CO.	
Hooker Alan & Laurie	W 3500 Reinway Rd.	ewebabe@gmail.com
Albert & Patty Marquez	Big Springs Ranch Rd.	
CASSIE NOWELL	YAVAPAI CO	
Betsy Terry		
Marylan M McKinney	Paulden	
Doug McKinney	Paulden	
[illegible] Peterson	YAVAPI County Little Ranch Rd	
Kathy Mutteral	22100 N Wolf Den Lane	
MELODY ROTH	22100 N WOLF DEN LN PAULDEN	
Richard & Mary [illegible]	25995 N Hooty	
DAN & KATHI DORE		
Bob & Lynn Taylor	2655 Big Chino Rd	
Steve & Beverly Long	410 W Big Chino Rd	
Sher Bennett		
STEVE FREY	25400 N. IRONWOOD DR. PAULDEN	SFREY124@AOL.com
Peter Thomma		
Deb Stephens	26895 N Champagne Ln	dSWALKERS283@GMAIL.com
Mary Christensen	3370 W. Harvest Way Paulden	
Sue Tone	Daily Courier	stone@prescottaz.com.
Mel Zurmaroll		
Lisa Wells / Cliff Hodges	24925 N. Camino Del Reino, Paulden	wellsmnaz@yahoo.com
[illegible] +2 visiting friends	~~8[illegible] Stockton~~ 270 E. Yogi Path Park	

NAME	ADDRESS	EMAIL
JoAnn Hankey	22580 Malapai Ridge	jhquilts@commspeed.net
Dana Riddle	740 W. Willow Wind Tr	dana_riddle@msn.com
Starlyn Price	22340 Sunny Ln	starlyn555@gmail.com
Walter Rupp	PO Box 214 Chino	
Helen Rupp	PO Box 214 Chino	
Demi Thompson	22075 N Triple L Lane	
Sam Thompson	"	Dusty12cycs@Yahoo.com
Dyan Miller	240 W. Granada Dr.	dyanymiller@hotmail.com

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swers to allow you time to speak directly
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Ranch

azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Would problem areas such as 179 into Sedona take money away from Northwest district?

ADOT azdot.gov

Question Card

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No more round abouts 18 wheelers DO NOT FIT!
Check out the (first) black rubber marks not on the round button

ADOT azdot.gov

swered at the end of the presentation,
pass it to an ADOT project representative.
swers to allow you time to speak directly
stion, we encourage you to speak with a
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there ASAP

azdot.gov

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Can we get a light at Bigchino & Bramble.
Please

ADOT azdot.gov

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What is more expensive to install?
A. Traffic signals
B. Round-a-bouts.

ADOT azdot.gov

guntas

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royecto de ADOT. Hemos limitado el tiempo
o de que hable directamente con el personal
pregunta, le aconsejamos que hable con un
imir legiblemente.

Douts

ne turn lane

azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Why an access point at Frontea Rd rather than Buffalo Ranch Rd which has more traffic?

ADOT azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Why wasn't Left Turn Lane installed with the recent hiway construction @ Little Ranch? Also when will the access to Little Ranch be repaired?

ADOT azdot.gov

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nswers to allow you time to speak directly
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g legibly.

T

FIT TURN LANES @ HIGH/ LAKE

US THE DOOR TO DEVELOPERS

azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

I think we need school buses pull off. Thought round about were on intersections? +

ADOT azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Comments You will probably see universal opposition to a traffic circle at Big Chino. Rather wait until traffic warrants are met for a signal. However, lighting is needed now at this intersection

ADOT azdot.gov

[redacted]

nswered at the end of the presentation,
pass it to an ADOT project representative.
swers to allow you time to speak directly
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azdot.gov

Question Card

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I hear "cost benefit" – is there a Lives benefit analysis?
If Phoenix has 30% of the population
Do they get 90% of highway
Funds?

ADOT azdot.gov

Question Card

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Can ya'll
Would consider a merging ramp to join traffic to keep traffic moving on 89 rather than full intersections or many roundabouts?

ADOT azdot.gov

[redacted]

swered at the end of the presentation,
pass it to an ADOT project representative.
swers to allow you time to speak directly
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azdot.gov

Question Card

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Can the yield ~~signs~~ be changed to Stop Signs @ the roundabouts

ADOT azdot.gov

Question Card

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Thank you for including Little Ranch
left turn plans - Very dangerous
Intersection - Round abouts are
great! They allow traffic to keep
moving but also slow speed

ADOT azdot.gov

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like answered at the end of the presentation,
d and pass it to an ADOT project representative.
and answers to allow you time to speak directly
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azdot.gov

Question Card

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The section of Hwy 89 between CV & Pueblo is becoming more dangerous by the day - anything that can be done to improve road conditions (reduced speed, widening etc) would be appreciated

ADOT azdot.gov

Question Card

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When is it planned for Hwy 89 to be Repaved?

ADOT azdot.gov 1

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azdot.gov

Question Card

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Why does the median by Big China road need to be 16' wide? How does the roundabout play into it?

Any plans for entry from old 89 when the 4 lane is done?

ADOT azdot.gov

Question Card

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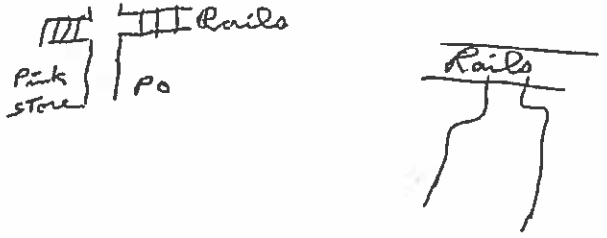

ADOT azdot.gov

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What about alternate transportation route - bicycles/walkers/horses?

Will side road cattle guards be removed?

What kind of safety lights?

Will turn lanes be equal @ intersections?
—Currently just a N bound turn lane (R) @ Verde Ranch Road

Will you be working PRIMARILY N from CV or as needed or hit & miss between 3N & Bramble?

12-181

ADOT

azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

How can you make 4 ln when the Hell canyon is 2 ln and make more problem and their are all ready two lanes

12-181

ADOT

azdot.gov

ADOT Self-Identification Survey

Completing this survey is voluntary. If you choose to respond, please mark all that apply.

ETHNICITY/RACE:

- ☐ American Indian/Alaskan Native
- ☐ Asian/Pacific Islander
- ☐ Hispanic/Latino
- ☐ African American/Black
- ☒ White
- ☐ Other

GENDER:

- ☒ Female
- ☐ Male

AGE:

- ☐ 1 - 20
- ☐ 21- 39
- ☐ 40 - 64
- ☒ 65+

DISABLED:

- ☐ Yes
- ☒ No

VETERAN STATUS:

- ☐ Yes
- ☒ No

12-200

ADOT Self-Identification Survey

Completing this survey is voluntary. If you choose to respond, please mark all that apply.

ETHNICITY/RACE:

- ☐ American Indian/Alaskan Native
- ☐ Asian/Pacific Islander
- ☐ Hispanic/Latino
- ☐ African American/Black
- ☑ White
- ☐ Other

GENDER:

- ☐ Female
- ☑ Male

AGE:

- ☐ 1 - 20
- ☐ 21- 39
- ☐ 40 - 64
- ☑ 65+

DISABLED:

- ☑ Yes
- ☐ No

VETERAN STATUS:

- ☑ Yes
- ☐ No

12-200

State Route 89 Chino Valley to Forest Boundary Transportation Study
Road 3 North to two miles north of Bramble Drive in Paulden

Public Information Meeting Overview –
Town of Chino Valley council meeting

TRACS: P8600 70P

Overview

Project:	State Route 89 Chino Valley to Forest Boundary Transportation Study Road 3 North to two miles north of Bramble Drive in Paulden
Meeting Type:	Council meeting
Intention:	To introduce the transportation study to the local area, including residents and business owners. Explain the need, timeframe and intent behind the study.

Meeting Date and Location

Date/Time:	Tuesday, Jan. 10, 2017 | 6 p.m.
Location:	Town of Chino Valley Council meeting | 202 N. State Route 89, Chino Valley, AZ 86332
Intention:	To engage the local community in a study that would eventually impact them greatly. To explain and highlight the areas ADOT feels need attention along the corridor. ADOT wants to explain how this study identifies several necessary improvements to address safety, access, mobility, and capacity issues.

Public Meeting

Format and Meeting Site Layout

Format: The Office of Community Relations coordinated with the Town of Chino Valley to get study information on the agenda. Tricia Lewis worked with Cecelia Grittman, the interim town manager to coordinate the study details and preparation for council. The meeting layout was as it is during a council meeting with a podium and screen at the front of the room with rows of chairs for audience members. Alvin Stump, the NW District Engineer did a presentation/slide show and then opened up the meeting to questions and answer session but was limited per the mayor. The presentation with questions was over at 6:15 p.m. but members of the public came out to the hallway to ask the project team questions. Many of the written questions were answered in the hallway with the members of the project team interacting with the public.

Meeting layout

- Chairs: 100 set up theater style with podium and head table at the front of the room
- Tables: No tables were set up
    - Registration and Title VI – setup in the back of the room
- A/V: One microphone
- Sign-in/orientation

- Materials: Sign-in sheets; Title VI information was provided and mentioned during beginning of presentation

Presentation:

The council meeting began with pledge of allegiance and call to the public. At approximately 6:00, Dan Gabiou asked the council if we could send around a sign-in sheet for people to sign in as part of our meeting. The sign-in sheets were distributed around the room and collected once everyone had a chance to fill them out. The council had a small agenda prior to Alvin Stump's presentation. Alvin introduced the team members (Dan Gabiou and Tricia Lewis). Alvin began with the study overview but before the presentation got into detail, he highlighted the Title VI materials. A detailed slide show was presented and then a very brief Q&A session followed).

- Presented by Alvin Stump (study overview)

Questions:

- Written comments/questions were answered during the presentation
- A Q&A session was not permitted during the council meeting, members of the public were asked to fill out comment cards and four were received

Meeting Schedule:

6:00 p.m.: Council meeting began

- Registration table and Title VI display in back of the room
- Screen at the front of the room, A/V equipment provided

6:00 p.m. – Meeting began with regular council agenda items and open to members of the public prior to ADOT getting the floor

7 p.m. – Project team discussed with a few residents and then were dismissed

Notifications:

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21 (both Wednesday since that is production day)
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3881 stakeholders
- Project webpage was created: azdot.gov/pauldenstudy
- Information through the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley

Contact information for collateral:

Email: tlewis@azdot.gov

Phone: 928.606.2420

ADOT
Civil Rights Office
15-0510 R12/16 azdot.gov

TITLE VI MEETING SUMMARY

TITLE VI MEETING SUMMARY FOR: SR 89 Chino Valley to Forest Boundary Transportation Study

TO: ADOT Civil Rights Office

FROM (Name, Title, Program Area/Unit):

Tricia Lewis, senior community relations officer, ADOT communications, NW District

Name and purpose of meeting:

Town of Chino Valley council meeting - purpose of meeting was to inform and update the Town of Chino Valley about the study and explain the short, mid and long-term recommendations for the corridor.

Date, location and summary of activities at meeting:

Tuesday, Jan. 10, council chambers 202 N. State Route 89, Chino Valley, AZ 86332
Alvin Stump provided a short presentation before council and members of the audience at their monthly meeting.

Number of public attendees: _____

Accommodation Request for Limited English Proficiency (LEP) and ADA:

Accommodations made in advance or requested? (ex. Interpretation, translation, listening device)	How was the request accommodated? (ex. Interpreter, Translator, renting of a listening device)	Estimated cost associated with accommodation? ($)

# of Self-Identification Surveys returned: _____

ADOT Self-Identification Survey - Title VI

CATEGORY	DESIGNATION	COUNT
Race/Ethnicity	African American/Black	
	American Indian/Alaskan Native	
	Asian	
	Hispanic/Latino	
	Native Hawaiian/Other Pacific Islander	
	White	
Sex	Female	
	Male	

Additional Information (Optional): Use the space below to provide any additional information about the meeting or accommodations

Note: attach a copy of any advertisements and mailers that were used to publicize this meeting as well as a photo of the Title VI display.

Please click the submit button when you have completed this form to open an email and send to CivilRightsOffice@azdot.gov.

Submit

SR 89 Chino Valley to Forest Boundary Transportation Study

Completion of this sign-in sheet is completely voluntary and helps the project team keep an accurate record of meeting attendees. Under state law, any identifying information provided below will become part of the public record and, as such, must be released to any individual upon request. Please print clearly.

NAME	TITLE	COMPANY	ADDRESS	PHONE	EMAIL
Harynkena Gregor Knauer			1070 N. Cherokee Dr. C.V.		harynkshq.knauer@gmail.com
Gary Beverly		Sierra Club	PO Box 176/1219 Granite Creek CV	928 308-1003	gloverde@cableone.net
Cheryl Romley			828 Talia Place CV, Az	928 636-3098	csesinger@aol.com
Ron Romley			828 Talia Pl CV Az	928-710-9592	Rromley@aol.com
ROBERT + JUDY COONTS			1990 E. El Nopal PRESCOTT AZ	928-583-5386	judy.coonts@gmail.com
Alton + Deretta Kemp			P.O. Box 895 Chino Az	928-636-2711	
EVA + MIKE DAMIANO			820 E LATIGO CT, PRESCOTT	928 583 0720	damianoeva@gmail.com

ADOT

SR 89 Chino Valley to Forest Boundary Transportation Study

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NAME	TITLE	COMPANY	ADDRESS	PHONE	EMAIL
Tom Payne		Tom's Print + Sign	98 W. State Rt 89	928-636-4266	Tom@TomsPrintShop.com
John Scholl	Superintendent	Chino Valley USD	650 E Center St CV.	928 636 2458	jscholl@chinovalleyschools.com
Ruth Mayday	Development Svcs Dir.	TOCV		928 636 4427	rmayday@chinoaz.net
Cloyce Kelly	citizen	American Legion Scouts + STAR ROTC	1981 W. Bumblebee Dr	942 302 9026	
Mike Webb	citizen		30 Cactus Wren	928-515-9736	Zihnh@yahoo.com
Jim Partridge	citizen		6550 N. Bison Walk DR	928 636 4829	jdpartridge@q.com
Diana Partridge	citizen		6550 N. Bison Walk DR	1-928-899-7124	jdpartridge@q.com

ADOT

SR 89 Chino Valley to Forest Boundary Transportation Study

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NAME	TITLE	COMPANY	ADDRESS	PHONE	EMAIL
Danielle Feller			PO Box 2998 CV. 86323	818/667-9175	daniani2@hotmail.com
Gary Fong			1695 W. Rd 5 N Chino	928-636-5107	gmd@gwestoffice.net
Suzanne Froelich			Country West #28	928 ~~283-0~~ 254 715-5986	
Linda S Lizarraga			330 Lauren Ln CV	928 583 0497	ls12123@gmail.com
John Alcaraz			1427 New York Pl CV	623-695-6627	

ADOT

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Design in wildlife corridors and bypass structures?

Don't harm our pronghorn!

12-101

ADOT azdot.gov

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

Turn left lanes at Buffalo Run Road and Frontier road is needed. It is impossible for residents to turn left off of Hwy 89 onto these roads to go home without being run into. We had a fatality at Frontier in 2016. Left turn lanes are desperately needed before a passing lane.

12-101

ADOT azdot.gov

Diana Partridge 6550 N. Bison Walk Dr 86 Buffalo Run

Question Card

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What, if any, plans have been included for wildlife corridors in the widening plans?

Kate

Kateocm@cableone.net O'Connor

12-101

ADOT azdot.gov

Masse

9284204723

Question Card

If you have a question(s) that you would like answered at the end of the presentation, please write your question(s) on this card and pass it to an ADOT project representative. We have limited the time for questions and answers to allow you time to speak directly with project staff. If we do not get to your question, we encourage you to speak with a project representative. Thank you for printing legibly.

ADOT just finnished A Right Turn Lane at Verde Ranch Rd. Why is it twice as long as the Right turn lane for north bound traffic at the south end of old Hw 89 just North of marker 333?

12-101

ADOT azdot.gov

State Route 89 Chino Valley to Forest Boundary Transportation Study
Road 3 North to two miles north of Bramble Drive in Paulden

Public Information Meeting Overview –
Yavapai County Board of Supervisors monthly meeting

TRACS: P8600 70P

Overview

Project:	State Route 89 Chino Valley to Forest Boundary Transportation Study Road 3 North to two miles north of Bramble Drive in Paulden
Meeting Type:	Study presentation during monthly board meeting
Intention:	To introduce the transportation study to the Yavapai County Board of Supervisors and the general public. Explain the need, timeframe and intent behind the study.

Meeting Date and Location

Date/Time:	Wednesday, Feb. 1, 2017 | 9 a.m.
Location:	Yavapai County Board of Supervisors meeting | 1015 Fair Street, Prescott, AZ 86305
Intention:	To explain and highlight the areas ADOT feels need attention along the corridor. ADOT wants to explain how this study identifies several necessary improvements to address safety, access, mobility, and capacity issues.

Public Meeting

Format and Meeting Site Layout

Format: ADOT was given the first item on the agenda for the monthly board meeting. The meeting site layout was rows of chairs with a podium at the front of the room. Alvin Stump, the NW District Engineer did a presentation/slide show and then answered questions from the board members. A few audience members asked questions about the study such as when this study would go into construction and also some suggestions about intersection improvements at Buffalo Run Road and SR 89.

Meeting layout

- The meeting was set up for a CYMPO board meeting and was in the Yavapai County Board of Supervisors chambers. There are rows of chairs set up facing the board members.
- Tables: No tables were set up
    - Registration and Title VI – setup on the table on the side of the room (photos provided)
- A/V: One microphone
- Sign-in/orientation
    - Materials: Sign-in sheets; Title VI information was provided and mentioned during beginning of presentation

Presentation:

ADOT was a guest at the Yavapai County Board of Supervisor's meeting and had ADOT study presentation at the beginning of the agenda. At approximately 9:10 p.m., Alvin Stump stood up and introduced him and Tricia Lewis. Alvin began with the study overview but before the presentation got into detail, he highlighted the Title VI materials. A detailed slide show was presented and then Alvin took questions from the BOS.

Even though the presentation was on the SR 89 study, many members of the BOS asked questions about I-17. The county administrator spoke up to remind the BOS the item was on the 89 study not improvements on I-17.

- Presented by Alvin Stump (study overview)

Questions:

- Written comments/questions were answered during the presentation

Meeting Schedule:

9:00 a.m.:

Screen at the front of the room, A/V equipment provided

9:10 a.m.: Meeting began with invocation and a few agenda items. ADOT did the presentation and then questions from the Yavapai County Board of Supervisors. The study presentation was familiar because a few of the BOS had seen the presentation prior to this meeting.

Notifications:

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21 (both Wednesday since that is production day)
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3881 stakeholders
- Project webpage was created: azdot.gov/pauldenstudy
- Information through the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley

Contact information for collateral:

Email: tlewis@azdot.gov

Phone: 928.606.2420

ADOT
Civil Rights Office
15-0510 R12/16 azdot.gov

TITLE VI MEETING SUMMARY

TITLE VI MEETING SUMMARY FOR: SR 89 Chino Valley to Forest Boundary Transportation Study

TO: ADOT Civil Rights Office

FROM (Name, Title, Program Area/Unit):

Tricia Lewis, senior community relations officer, ADOT communications, NW District

Name and purpose of meeting:

Yavapai County Board of Supervisors meeting - held during the monthly board meeting. The purpose of the meeting was to inform the BOS about the transportation study. Provide an opportunity for questions from BOS and general public.

Date, location and summary of activities at meeting:

Wednesday, Feb. 1 at the Yavapai County BOS board room at 1015 Fair Street, Prescott, AZ 86305
Alvin Stump provided a short presentation to the BOS and members of the audience during the monthly board meeting.

Number of public attendees: 35

Accommodation Request for Limited English Proficiency (LEP) and ADA:

Accommodations made in advance or requested? (ex. Interpretation, translation, listening device)	How was the request accommodated? (ex. Interpreter, Translator, renting of a listening device)	Estimated cost associated with accommodation? ($)
A blind woman asked about attending a meeting and couldn't get transportation to a night meeting.	Community Relations offered the two day meetings, the Yavapai County BOS and the CYMPO board meeting would be held during the day.	$0

# of Self-Identification Surveys returned: 0

ADOT Self-Identification Survey - Title VI

CATEGORY	DESIGNATION	COUNT
Race/Ethnicity	African American/Black	
	American Indian/Alaskan Native	
	Asian	
	Hispanic/Latino	
	Native Hawaiian/Other Pacific Islander	
	White	
Sex	Female	
	Male	

Additional Information (Optional): Use the space below to provide any additional information about the meeting or accommodations

Note: attach a copy of any advertisements and mailers that were used to publicize this meeting as well as a photo of the Title VI display.

Please click the submit button when you have completed this form to open an email and send to CivilRightsOffice@azdot.gov.

Submit

713-724

Board of Supervisors – Sign in Sheet

Feb. 1, 2017

ADOT Paulden Study – Meeting #3

NAME	Company	Email
Cynthia Gentle	Yavapai County	cynthia.gentle@yavapai.us
TERI DREW	NACOG	jsweeya@nacog.org
Michael Holmes	Yavapai County	Michael.Holmes@yavapai.us
Sara Ekwall	Yavapai County	sara.ekwall@yavapai.us
Marlyn Summers	Yavapai County	marlyn.summers@yavapai.us
Barbara Fox	Yavapai County	barbara.fox-thomas@yavapai.us
DeShannan Young	Yavapai County	deshannan.young@yavapai.us
Mary Conner	Yavapai Co.	mary.conner@yavapai.us
Ken VanKeuren	Y.C.	Kenny.VanKeuren@yavapai.us
David Rhodes	YCSO	david.rhodes@yavapa.us
Wendy Ross	Yavapai County	wendy.ross@yavapai.us
Kevin Blake	Yavapai County	Kevin.Blake@yavapai.us
Kristy Kennedy	YCDS	Kristy.Kennedy@yavapai.us
Steven Mauk	YCDS	Steven.Mauk@yavapai.us
David Beau Boisvert	Yavapai County Assessor's Office	david.boisvert@yavapai.us
Nicole Russell	YCDS	nicole.russell@yavapai.us
Tammy DeWitt	Yavapai Co	tammy.dewitt@yavapai.us
Byron Jasper	YCPW	byron.jasper@yavapai.us
RANDY SCHENCK		rtks_86@yahoo.com
JIM RAY		cowtinstrz@AOL.com
PHILIP LAPLANTE		
KERK MALLORY		KMallory440@AOL.com
MARY Mallory		Kmmallory2000@yahoo.com
CAL WINNAHAN		SUPERVISOR Smith office
Frank Vander Horst	VASD #59	frank.vander.horst@yavapai.us
[illegible]	VA	[illegible]

Billie Orr	City of Prescott	billieorr@aol.com
LARRY Hartley		[illegible]
Bob Betts	PAWUG	pawugchair@gmail.com
George Sheats	Prescott PAZ	gsheats@aol.com
Jim Peterson	Prescott - citizen	JPeterson@cableone.net
GREG CANAVARRO	PAWUG	7achilles@gmail.com
DAN & DARCY DELEONARDIS	PRESCOTT	dannydeleonardis@gmail
Steve & Penny Goredich	Paulden	penny.goredich@gmail

State Route 89 Chino Valley to Forest Boundary Transportation Study
Road 3 North to two miles north of Bramble Drive in Paulden

Public Information Meeting Overview –
Central Yavapai Metropolitan Planning Organization (CYMPO) Board meeting

TRACS: P8600 70P

Overview

Project:	State Route 89 Chino Valley to Forest Boundary Transportation Study Road 3 North to two miles north of Bramble Drive in Paulden
Meeting Type:	Study presentation during monthly board meeting
Intention:	To introduce the transportation study to the CYMPO, including residents and business owners. Explain the need, timeframe and intent behind the study.

Meeting Date and Location

Date/Time:	Wednesday, Feb. 15, 2017 | 4 p.m. to 6 p.m.
Location:	Yavapai County Board meeting | 1015 Fair Street, Prescott, AZ 86305
Intention:	To engage the local community in a study that would eventually impact them greatly. To explain and highlight the areas ADOT feels need attention along the corridor. ADOT wants to explain how this study identifies several necessary improvements to address safety, access, mobility, and capacity issues.

Public Meeting

Format and Meeting Site Layout

Format: ADOT was given the first item on the agenda for the monthly board meeting. The meeting site layout was rows of chairs with a podium at the front of the room. Alvin Stump, the NW District Engineer did a presentation/slide show and then answered questions from the board members. A few audience members asked questions about the study such as when this study would go into construction and also some suggestions about intersection improvements at Buffalo Run Road and SR 89.

Meeting layout

- The meeting was set up for a CYMPO board meeting and was in the Yavapai County Board of Supervisors chambers. There are rows of chairs set up facing the board members.
- Tables: No tables were set up
    - Registration and Title VI – setup on the table on the side of the room (photos provided)
- A/V: One microphone
- Sign-in/orientation
    - Materials: Sign-in sheets; Title VI information was provided and mentioned during beginning of presentation

Presentation:

The CYMPO board meeting had their regular monthly agenda but put ADOT's study presentation at the beginning of the meeting. At approximately 4:10 p.m., Tricia Lewis and Alvin Stump stood up and introduced themselves.. Alvin began with the study overview but before the presentation got into detail, he highlighted the Title VI materials. A detailed slide show was presented and then a Q&A session (that included 2 questions). Alvin answered all the questions during the meeting.

- Presented by Tricia Lewis (welcome, introduction of study team, purpose of the meeting and Title VI information)
- Presented by Alvin Stump (study overview)

Questions:

- Written comments/questions were answered during the presentation
- Questions were addressed during the call to public portion of the meeting

Meeting Schedule:

4:00 p.m.: Set-up (Communications, Project Team)

- Registration table
- Screen at the front of the room, A/V equipment provided

4:05 p.m. – Meeting began with Opening remarks and approval of past meeting board meeting minutes. ADOT did the presentation and then answered two questions from the public. ADOT was complete with the study presentation by 4:25 p.m.

Notifications:

- Newspaper ad published in the Chino Valley Review on Wednesday, Dec. 7 and Dec. 21 (both Wednesday since that is production day)
- Postcard mailed to 2,500 residents, business owners along the corridor that were within ¼ mile of the project
- Gov Delivery email blast about the meeting to over 3881 stakeholders
- Project webpage was created: azdot.gov/pauldenstudy
- Information through the Paulden Post Office, Family Dollar store, local gas stations, McDonald's in Chino Valley, Town of Chino Valley

Contact information for collateral:

Email: tlewis@azdot.gov

Phone: 928.606.2420

ADOT
Civil Rights Office
15-0510 R12/16 azdot.gov

TITLE VI MEETING SUMMARY

TITLE VI MEETING SUMMARY FOR: SR 89 Chino Valley to Forest Boundary Transportation Study

TO: ADOT Civil Rights Office

FROM (Name, Title, Program Area/Unit):

Tricia Lewis, senior community relations officer, ADOT communications, NW District

Name and purpose of meeting:

CYMPO board meeting - purpose of meeting was to inform and update the CYMPO board and general public about the study and explain the short, mid and long-term recommendations for the corridor.

Date, location and summary of activities at meeting:

Wednesday, Feb. 15 at 1015 Fair Street, Prescott, AZ 86305
Alvin Stump provided a short presentation to the CYMPO board and members of the public at the monthly board meeting.

Number of public attendees: 6

Accommodation Request for Limited English Proficiency (LEP) and ADA:

Accommodations made in advance or requested? (ex. Interpretation, translation, listening device)	How was the request accommodated? (ex. Interpreter, Translator, renting of a listening device)	Estimated cost associated with accommodation? ($)
n/a	n/a	n/a

# of Self-Identification Surveys returned: 0

ADOT Self-Identification Survey - Title VI

CATEGORY	DESIGNATION	COUNT
Race/Ethnicity	African American/Black	
	American Indian/Alaskan Native	
	Asian	
	Hispanic/Latino	
	Native Hawaiian/Other Pacific Islander	
	White	
Sex	Female	
	Male	

Additional Information (Optional): Use the space below to provide any additional information about the meeting or accommodations

Note: attach a copy of any advertisements and mailers that were used to publicize this meeting as well as a photo of the Title VI display.

Please click the submit button when you have completed this form to open an email and send to CivilRightsOffice@azdot.gov.

Submit

CYMPO
Central Yavapai Metropolitan Planning Organization

Executive Board Meeting

DATE: February 15, 2017

CYMPO
Central Yavapai Metropolitan Planning Organization

PLEASE PRINT

SIGN-IN SHEET

NAME	ORGANIZATION (If Applicable)	E-Mail Address	Phone
CHERI & RON RONLEY	YAVAPAI REGIONAL TRANSIT	RRonley@aol.com CSesinger@aol.com	928 210 9392 928 710-5295
Kent Goodyear			
DAVE BABBITT			
BILL HAWKINS			
Charles ANDREWS	COP	charles.andrews@prescott-az.gov	928 777 1163
Kirk Ivy			
Tom Armstrong		TomArmstrong_2@msn.com	
ANDREW WALLACE	CITIZEN		PRESCOTT, AZ
J.D. GREENBERG	WILDLIFE FOR PYDC	ON FILE	
Norm Davis	Town of Prescott Valley	on file	
Michael Lopez	Town of Chino	—	—
Tricia Lewis	ADOT	tlewis@azdot.gov	928-606-2420

Prescott Audubon Society

A Chapter of the National Audubon Society

© 2012

P. O. Box 4156; Prescott, Arizona 86302

2-9-17
Response
letter mailed
2-1017

Tricia Lewis
Arizona Department of Transportation
1109 Commerce Dr.
Prescott, AZ 86305

tlewis@az.dot.gov

RE: SR89 Chino-Paulden Transportation Study

January 26, 2017

To the AZ Department of Transportation:

On behalf of all members of the Prescott Audubon Society, we submit the following comments and concerns regarding the proposed widening of SR 89 between Chino Valley and Paulden, in Yavapai County.

For safety reasons, we support appropriate improvements to SR 89 between Paulden and Chino Valley, as traffic is increasing along the entire route from Ash Fork to Chino. We also support planning that integrates transportation and community, including "system preservation practices such as green corridor programs" (text from AZ law promising priority funding for plans that include these factors). We believe that coordinated plans that take into account all the types of corridors – water, wildlife, utilities, and community development –during the planning process will result in the most economic and social benefit at the lowest cost in the long term. Sustainable and low maintenance in design beats costly retrofitting. We at Prescott Audubon do not claim to be experts in the costs and complexities of transportation planning, but our 550 members are taxpayers with an interest in the best quality of life in the Yavapai County region.

- As commercial and retail buildings grow on the north end of Chino, and as residential traffic increases in Paulden, there will be more merging into traffic along this route. Roundabouts and

turning lanes, as well as slower speed limits seem reasonable here. Slower speeds also reduce bird and wildlife mortality.

- At Road 6 North in Chino, on the east side, the Del Rio Springs supports an active Bald Eagle nest site. Such nest sites are protected by the AZGFD, usually from December through April. Please consult with the AZGFD to ensure that construction in that region is not scheduled during that time of the year.

- Unfortunately, bright lights attract wildlife to highways. Highway lighting should be as modest as possible, with lights that face downwards only. Collisions with wildlife, especially raptors and owls, will be minimized. The lands along this stretch of road support hundreds of raptors, especially during the spring and fall migration seasons.

- What is the status of the planned "Great Western Drive", the highway that would bypass Chino to the east? If that is to be the roadway for through traffic, then SR 89 becomes the business district, which means more turning lanes will be needed for entering and exiting SR 89. Widening the entire section may not be as important, and wildlife corridor planning will be different.

- The Big Chino Wash flows below this segment of the road, and watercourses attract life of every sort, including human. Design should ensure that this major corridor is not adversely affected by highway changes.

- The region between Chino and Paulden still supports Pronghorn herds, and impact on their migratory corridors should be minimized. Pronghorn are a symbol of Arizona, of value to residents and visitors alike. Pronghorn will not cross paved roadways that carry as much traffic as SR 89 does.

We thank you for the opportunity to submit these comments and be a small part of the collaborative process. We have seen the successes of planning that minimizes adverse impacts to the environment in other parts of Arizona, and we have a strong interest in ensuring the same for our Yavapai County region.

Sincerely,

Board of Directors

PRESCOTT AUDUBON SOCIETY

ADOT

Multimodal Planning

February 9, 2017

Subject: SR89 Chino Valley to Forest Boundary Transportation Study Letter

Dear Prescott Audubon Society Board of Directors,

Thank you for your letter dated January 26, 2017. ADOT appreciates the Prescott Audubon Society's participation in the SR89, Chino Valley to Forest Boundary Transportation Study. Your input has been reviewed by the Study Team and taken into consideration. Please see the below response to your comments received:

- ADOT appreciates the Prescott Audubon Society's support of roundabouts within this corridor. Roundabouts are proven safety countermeasures which are being considered at several intersections throughout the corridor.
- ADOT has been made aware of the active Bald Eagle nest site off of Road 6 North. It will be noted within the study documents that any future design projects will further coordinate with the Arizona Game and Fish Department (AGFD) and US Fish and Wildlife Services (USFWS) to ensure compliance with the Bald and Golden Eagle Protection Act and the National Environmental Policy Act (NEPA).
- Roadway lighting is being considered as a future improvement near Sweet Valley Rd (near the Paulden Post Office). Your recommendation to use modest, downward-facing lighting will be considered during design and may be implemented if the recommendation meets state and federal design standards and is cost-effective.
- The "Great Western Expansion" is currently not programmed in ADOT's Tentative 10-year State Transportation Improvement Program. Likely a future study or design would be completed to address the Great Western Expansion when population growth, traffic needs, and funding permits.
- During design, coordination with the Army Corps of Engineers, AGFD, and USFWS would occur if any impacts were anticipated within the Big Chino Wash in order to comply with NEPA.
- Pronghorn antelope and other wildlife crossing improvements have been considered as part of this study. Although no wildlife overpass or underpass features were deemed feasible, wildlife crossing signs have been recommended as a near-term improvement to promote driver awareness.

Thanks again for your input and interest in the SR89, Chino Valley to Forest Boundary Transportation Study. Please visit the study website at azdot.gov/PauldenStudy for additional study details and contact Tricia Lewis (TLewis@azdot.gov or 928-606-2420) with any additional input or questions.

Sincerely,

Dan Gabiou, CPM
ADOT, Planning Program Manager
602-712-7025
DGabiou@azdot.gov

Paulden Area Community Organization
(a 501c3 organization)

PO Box 735
Paulden, AZ 86334

January 19, 2017

Mr. Alvin Stump
Arizona Dept. of Transportation
1109 E. Commerce Drive
Prescott, AZ 86305

Dear Mr. Stump:

On behalf of the Paulden Area Community Organization and Paulden residents, thank you for your presentation regarding the future of the Highway 89 corridor. As evidenced by the attendance, you can see that this matter is very important to our community residents and businesses. We appreciated the opportunity for questions and answers and believe that we were well informed by your thorough presentation. Thank you for your patience in answering our many questions. Please relay our appreciation to your team as well. We appreciate all you and they do for our community. We look forward to the future and continuing to work with you as a community partner as we continue to grow and thrive.

Sincerely,

Don Nowell, President

Daily Courier – Jan. 5.

ADOT wants input on Highway 89 between Chino Valley, Paulden

Originally Published: January 5, 2017 6 a.m.

The Arizona Department of Transportation is studying a 13-mile segment of Highway 89 between Road 3 North in Chino Valley and two miles north of Bramble Drive in Paulden. The purpose of this long-range planning study is to identify future roadway improvements as funding becomes available.

ADOT is asking for public input. Four meetings are scheduled and the same information will be presented at each meeting.

- Paulden Area Community Organization (PACO) at 7 p.m. Thursday, Jan. 5, at the Paulden Christian Fellowship Church, 165 Aspen Road, Paulden.
- Chino Valley Town Council meeting at 6 p.m., Tuesday, Jan. 10, at council chambers, 202 N. Highway 89, Chino Valley.
- Yavapai County Board of Supervisors meeting at 9 a.m., Wednesday, Feb. 1, 1015 Fair St., Prescott.
- Central Yavapai Metropolitan Planning Organization (CYMPO) Board meeting, 4 p.m., Wednesday, Feb. 15, 1015 Fair St., Prescott.

Persons who require a reasonable accommodation based on language or disability should contact Tricia Lewis at 928-606-2420 or email tlewis@azdot.gov. Requests should be made as early as possible to ensure the state has an opportunity to address the accommodation.

COMMENTS

Comments are not posted immediately. Submissions must adhere to our Use of Service Terms of Use agreement. Rambling or nonsensical comments may not be posted. Comment submissions may not exceed a 200 word limit, and in order for us to reasonably manage this feature we may limit excessive comment entries.

IH8Politics 6 hours, 42 minutes ago 0

Why is it that ADOT continues to put funding into roads that are not nearly as busy as others, roads like Hwy. 169 that have non-stop traffic for 15 miles on a 2 lane Hwy., and has a ton of semi traffic as well as passenger cars with fatal accidents weekly? ADOT owns the right of way to make 169 a 4 lane Hwy....

Sign in to suggest removal Sign in to reply

pvtom 6 hours, 21 minutes ago 0

These ADOT public meetings are a joke. Behind the scenes it is the operation of unrecorded meetings/phone calls between political forces that decide "what" will happen. The "missing" arm of the 89-69 interchange is a prime example.It was eliminated from final drawings without ANY comments as to "WHY". I found out why by digging.

Sign in to suggest removal Sign in to reply

Yabbadabbadoo 5 hours, 59 minutes ago 0

Put at least 10 roundabouts in.

Sign in to suggest removal Sign in to reply

williamgauslow 2 hours, 33 minutes ago 0

Should change Highway 89's name to Roundabout Way. Leave the two lane section thru the Dells "as is."

Sign in to suggest removal Sign in to reply

CV Review - Jan. 11

ADOT: More roundabouts planned for Highway 89

203 accidents in five years in 13-mile stretch of road

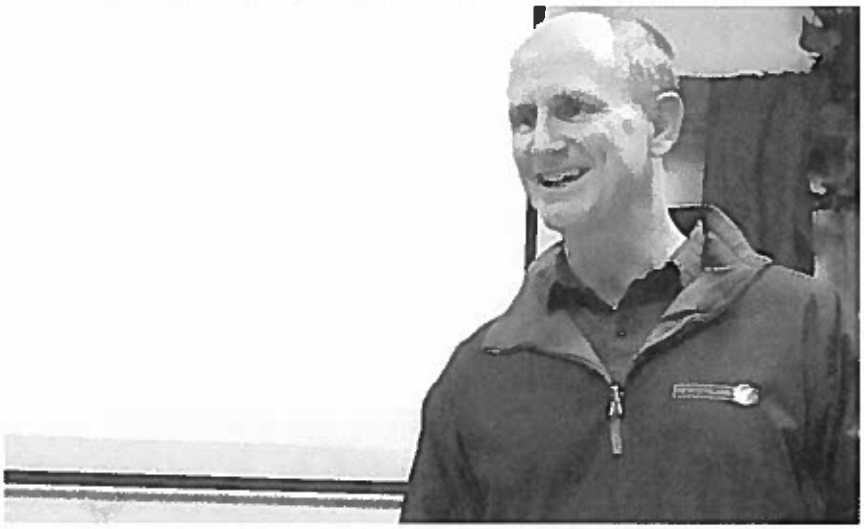

Photo by Sue Tone

Alvin Stump speaks at the Thursday, Jan. 5 Paulden Area Community Organization meeting, explaining plans for improvements on Highway 89.

By Sue Tone

tonenotes

Originally Published: January 11, 2017 5:40 a.m.

Plans to widen Highway 89 to four lanes on a 13-mile segment of road between Chino Valley and Paulden came as welcome news to most of the more than 60 audience members attending the Jan. 5 Paulden Area Community Organization meeting.

Only one resident expressed concerns that a wider road would bring developers; he preferred building passing lanes instead a widening of the highway.

Alvin Stump, Northwest District engineer with the Arizona Department of Transportation (ADOT), presented plans and a rough timeline for proposed work on Highway 89 extending from Road 3 North at the north end of Chino Valley northward to past the Wishing Well intersection within the Kaibab National Forest boundary.

Traffic congestion and accident issues on this stretch have led ADOT to plan for widening the road to four lanes, adding turn lanes, and putting in roundabouts.

CRASHING CONCERN

During five years, from 2010 through 2014, ADOT reported these incidents on Highway 89 for the 13 miles north of Perkinsville Road:

203 accidents

62 injury accidents

3 fatalities

Since 2014, there have been an additional two fatalities

At the mention of roundabouts, some in the audience voiced their disappointment. However, as the meeting progressed, many defended the benefits of roundabouts.

"I can appreciate not everybody's a fan of roundabouts. I'm not a fan of signals," Stump said. "You put in a signal, it doesn't control the speed. Drivers still blow through the intersection. Roundabouts force you to slow down. Fatalities are reduced by 90 percent."

Most of the 203 accidents reported between 2010 and 2014 occurred between Road 3 North and Road 4 North, Stump said, with a significant number between Rolling Hills Road and Paulden.

Based on traffic count studies at intersections, ADOT plans to expand Highway 89 to four lanes with a raised 8-foot median and 5-foot sidewalks on both sides between Road 3 North and Road 5 North. From Road 5 North to Sweet Valley/Old 89, it also plans four lanes with an open median with 4-foot shoulders, and 10-foot shoulders on the outside, including turn lanes at key intersections.

Traffic at Big Chino Road is approaching the point of needing a signal, Stump said. Little Ranch Road and Bramble Road are good candidates for roundabouts.

ADOT will be adding turn lanes through Paulden where the Post Office and the Pink Store are located, and may drop the speed limit to 45. This is in the design stage now.

Based on attendees' comments, other proposals ADOT is looking at met with their approval. These include full intersections at Old 89, Frontier, Rolling Hills, Little Ranch and Sweet Valley roads; a passing lane between Old Highway 89 and Frontier Road; and passing lanes further north between the forest boundary and Hell Canyon.

The time frame for completing the work is based on availability of funds. County Supervisor Craig Brown said the county lost about $13 million in Highway User Revenue Funds (HURF). He supports taking "baby steps" by breaking the 13-mile segment into smaller projects, as ADOT is proposing.

"When there is a little bit of money left over from other (ADOT) projects, we'll fight for that money," Brown said.

The entire project could take up to 20 years and about $60 million to complete.

ADOT representatives will make the same presentation and answer questions at three more venues:

• Chino Valley Town Council meeting at 6 p.m., Tuesday, Jan. 10, at council chambers, 202 N. Highway 89, Chino Valley.

• Yavapai County Board of Supervisors meeting at 9 a.m., Wednesday, Feb. 1, 1015 Fair St., Prescott.

• Central Yavapai Metropolitan Planning Organization (CYMPO) Board meeting, 4 p.m., Wednesday, Feb. 15, 1015 Fair St., Prescott.

Follow Sue Tone on Twitter @ToneNotes. Reach her at 928-445-3333 ext. 2043 or 928-642-7867.

Daily Courier
January 11, 2017

ADOT unveils plans for Highway 89 between Chino Valley, Paulden

More planned roundabouts thrill (or not) Paulden residents

By Sue Tone
tonenotes

Originally Published: January 11, 2017 5:55 a.m.

Plans to widen Highway 89 to four lanes on a 13-mile segment of road between Chino Valley and Paulden came as welcome news to most of the more than 60 audience members attending the Jan. 5 Paulden Area Community Organization meeting. Only one resident expressed concerns that a wider road would bring developers; he preferred building passing lanes instead a widening of the highway.

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At the mention of roundabouts, some in the audience voiced their disappointment. However, as the meeting progressed, many defended the benefits of roundabouts.

During the five years between 2010 and 2014, 203 accidents have occurred on the 13-mile segment between Chino Valley and Paulden, including:

62 injury accidents

3 fatalities

Since 2014, there have been additional accidents, including at least two fatalities, according to ADOT.

"I can appreciate not everybody's a fan of roundabouts. I'm not a fan of signals," Stump said. "You put in a signal, it doesn't control the speed. Drivers still blow through the intersection. Roundabouts force you to slow down. Fatalities are reduced by 90 percent."

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• Yavapai County Board of Supervisors meeting at 9 a.m., Wednesday, Feb. 1, 1015 Fair St., Prescott.

• Central Yavapai Metropolitan Planning Organization (CYMPO) Board meeting, 4 p.m., Wednesday, Feb. 15, 1015 Fair St., Prescott.

COMMENTS

BirdOfFire 2 hours, 45 minutes ago 0

I was excited to hear this road is finally, finally, going to be widened, until I read it will take 20 years to do it! What a joke. Are you kidding me? 20 years? This road needed to be widened 10 years ago. Imagine what it will be like in 20 years when complete! By then it will need to be 6 lanes. Wow, so ADOT just wasted our tax paying dollars to do a to do a traffic study 20 years in the future. The study will be ineffective by then. What a waste this meeting, article and discussion are. Widen the road already! Do it in 5 years!

DrSam 2 hours, 26 minutes ago 0

Seriously? Announcing the CV Town Council meeting the DAY AFTER it happens??? What a bush-league move.

-Roundabouts cause accidents. "Forcing" a slowdown on a long flat straight highway full of 20-ton trucks is an amateur thought process. This is a major commerce route alternate to I-17/Flagstaff ! I swear we need to drain the ADOT swamp next!

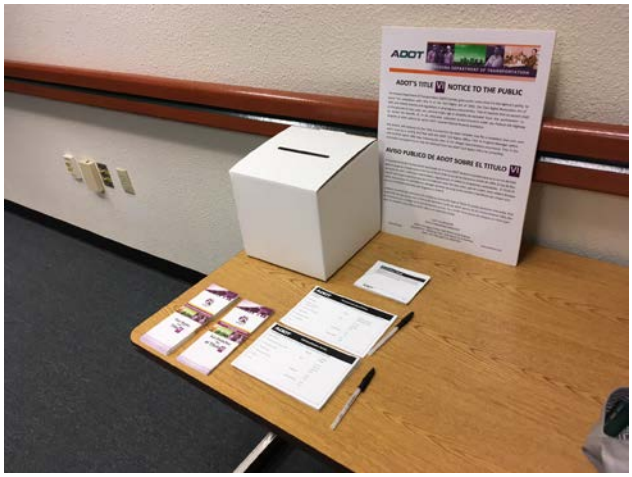
-How about fixing the worst high-sped highway in the state: the stretch north of Drake turnoff where pavement is broken, heaving and not flat nor graded to 65+ MPH vehicles.

-Maybe if ADOT officials tried driving these roads in any vehicle besides a new, state-maintained tax-payer paid car, they'd see/feel how unsafe these roads are at speed! UNSAFE! -add another circle, what morons. While they're at it, how about a high mound and statues to block any view of on-coming vehicles!?!

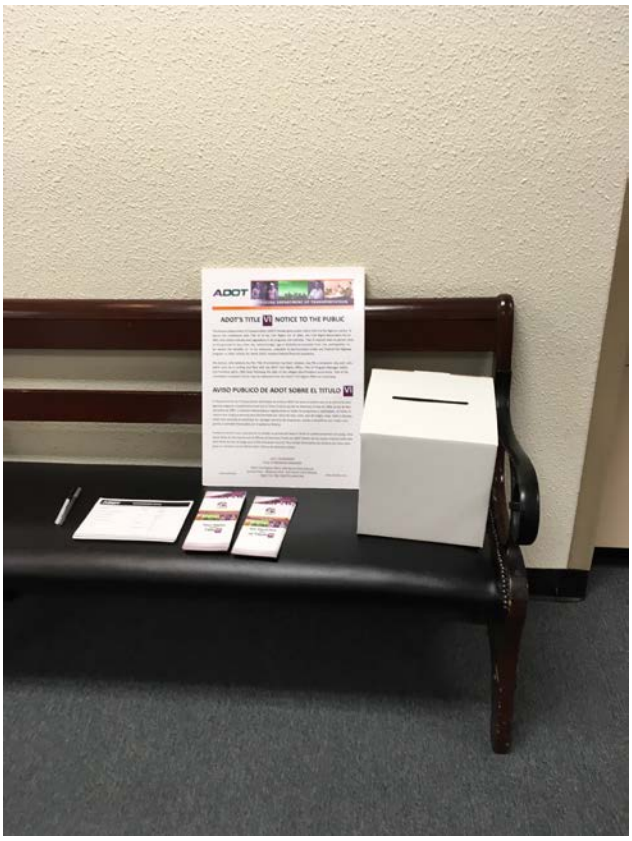
Public Involvement Photos

Picture 1

Picture 2



Picture 3



Picture 4

Picture 5

APPENDIX FR-1

Prescoping Reports, Field Review Reports, and Field Summary Notes

Planning Assistance for Rural Areas
PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: March 29, 2017	**ADOT Project Manager:** Dan Gabiou
Project Name: Widen to Four-lane Section with Raised Median from Butterfield Road to Road 4N	
City/Town: Town of Chino Valley	**County:** Yavapai
COG/MPO: Central Yavapai Metropolitan Planning Organization	**ADOT District:** Northwest District
Primary Route/Street: State Route 89	
Beginning Limit: Butterfield Road (MP 328.95)	
End Limit: Road 4N (MP 330.18)	
Project Length: 1.23 miles	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other	
Adjacent Land Ownership(s): *(Check all that apply)* ☒ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name: Town of Chino Valley		
LPA/Tribal Contact: Michael Lopez		
Email Address: mlopez@chinoaz.net	**Phone Number:** 928-636-7140	
Administration: ☒ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
Within the project area, the five year crash history indicates that crashes are generally clustered around intersections with a high number of left-turn crashes. Many of these appear to be attributable to a lack of access management. Driveway spacing within the corridor is dense and exceeds the recommended spacing in the Draft ADOT Access Management Guidelines. The population in Chino Valley is anticipated to grow 73% over the next 25 years; employment will increase 100%. There is a development platted between Road 3N and Road 3½N, so traffic volumes along SR 89 are increasing due to general growth as well as additional commercial and recreational traffic to I-40 and beyond. The anticipated increase in traffic volumes will compound the existing safety and access management issues.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☒
The primary purpose of the project is to widen SR 89 from Butterfield Road to Road 4N to a four-lane typical urban section with a raised median. South of Road 3N, there is an existing two way left turn lane, which will be converted to a raised median to improve access management and reduce the number of conflict points. The existing section transitions to a two-lane road just north of Road 3N; this section will be widened to four lanes with a raised median to improve access management and reduce the number of conflict points. These improvements compliment the recently constructed roundabouts at Perkinsville Road and Road 4N.			

Planning Assistance for Rural Areas
PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☒ Access / Traffic Control / Detour Issues	☒ Right-of-Way
☐ Constructability / Construction Window Issues	☒ Environmental
☐ Stakeholder Issues	☒ Utilities
☐ Structures & Geotech	☐ Other

Right-of-way: Project improvements will be located within the existing right-of-way. Temporary Construction Easements (TCE)s may be required south of Road 3N on both sides of the roadway and at some driveways. TCEs may be required just north of Road 3N on the west side of SR 89. Driveways will be reconstructed per ADOT standard detail C-05.20.

Traffic control will be needed during construction to protect the work zone, and phasing will need to accommodate the Town of Chino Valley emergency services located west of SR 89 on Road 3N.

Environmental: There is a potential historic house structure on the northwest corner of Road 3N. This is an area that should be avoided if possible. If impacts are necessary, design should seek to mitigate impacts.

Utilities: Utility relocation is required for this widening project. Overhead power lines run along the east and/or west side(s) of SR 89 for the majority of the project limits which will need to be relocated prior to construction. There are locations where these power lines cross SR 89, which should be protected during construction. Various utility service lines may cross SR 89 or be within the disturbed limits, including gas, cable, electric, and irrigation. Existing drainage facilities will be impacted by the proposed project based on conceptual design, including extending a culvert just south of Commercial Way. There are roadside drainage ditches and a storm drain pipe under the southbound lane(s) north in the southern portion of the project. Utility investigation is required during design.

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☒ HSIP	☒ State
	☒ Local	☐ Private	☐ Tribal	☐ Other:

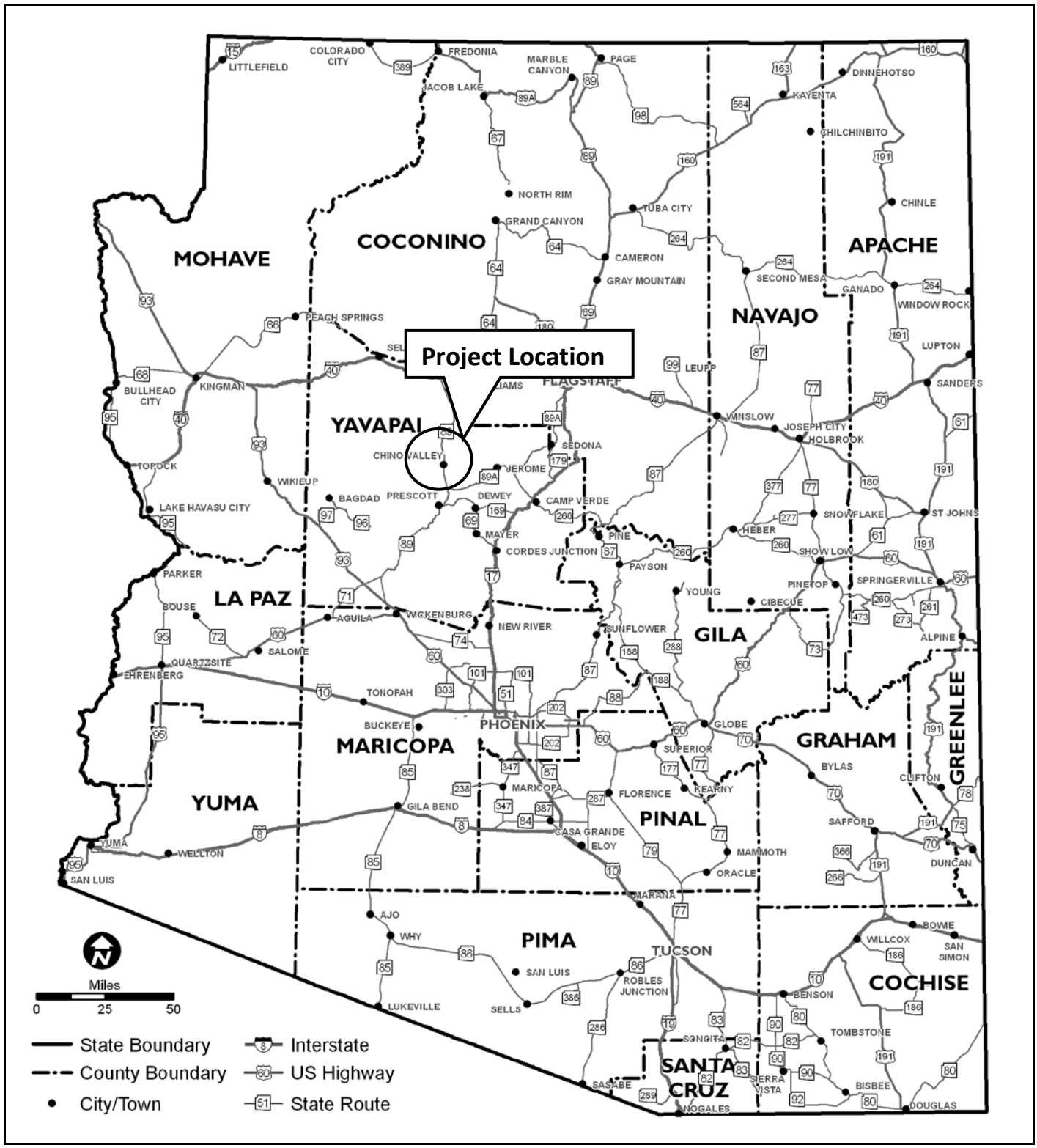
COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$128,000	$385,000	$0	$5,857,000	$6,371,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☒ Design-Bid-Build ☐ Design-Build ☐ Other: Indefinite quantities contract
Design Program Year: FY 2020 – FY 2025
Construction Program Year: FY 2021 – FY 2026

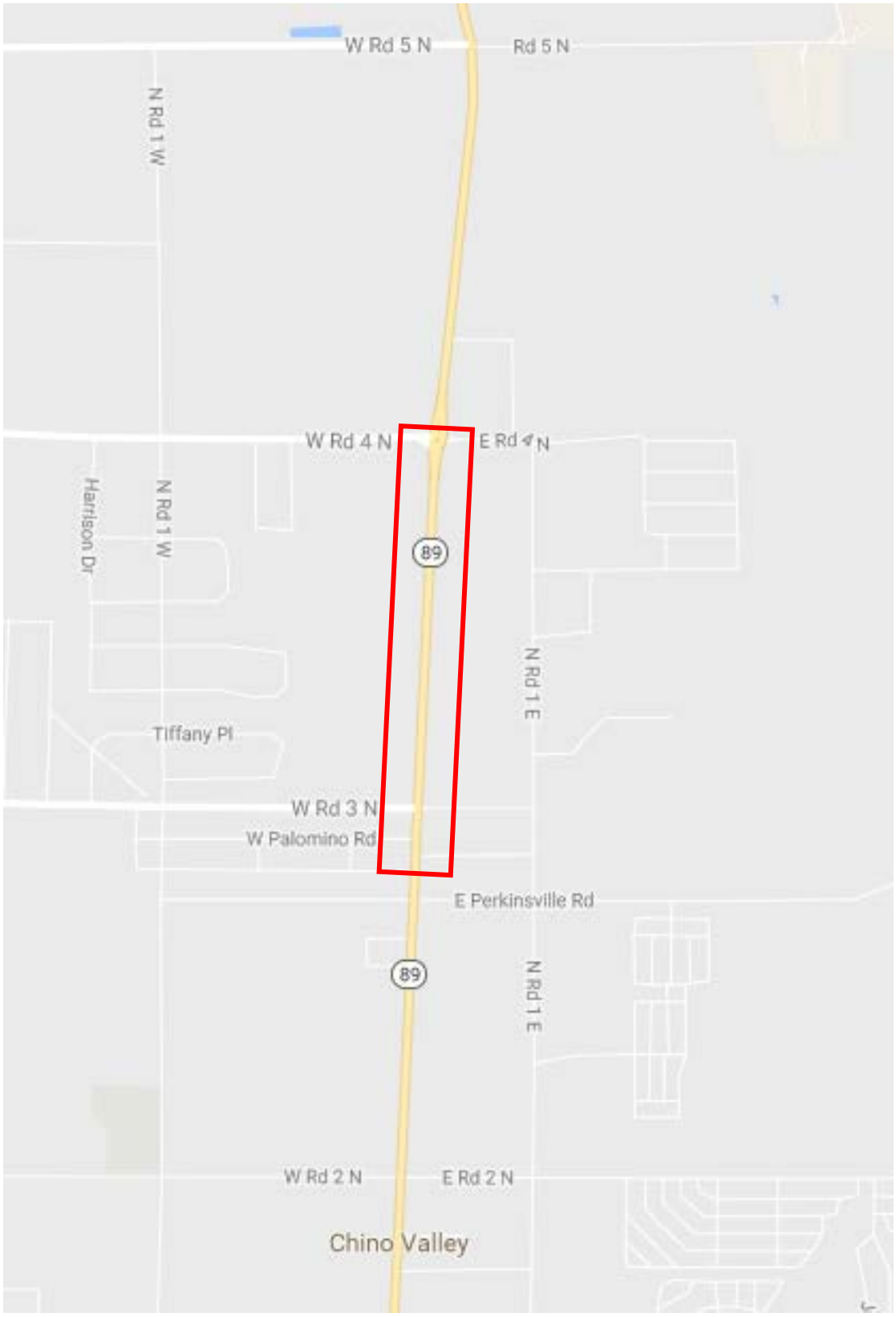
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



Project Limits: Butterfield Road to Road 4N

ATTACHMENT 3 – SCOPE OF WORK

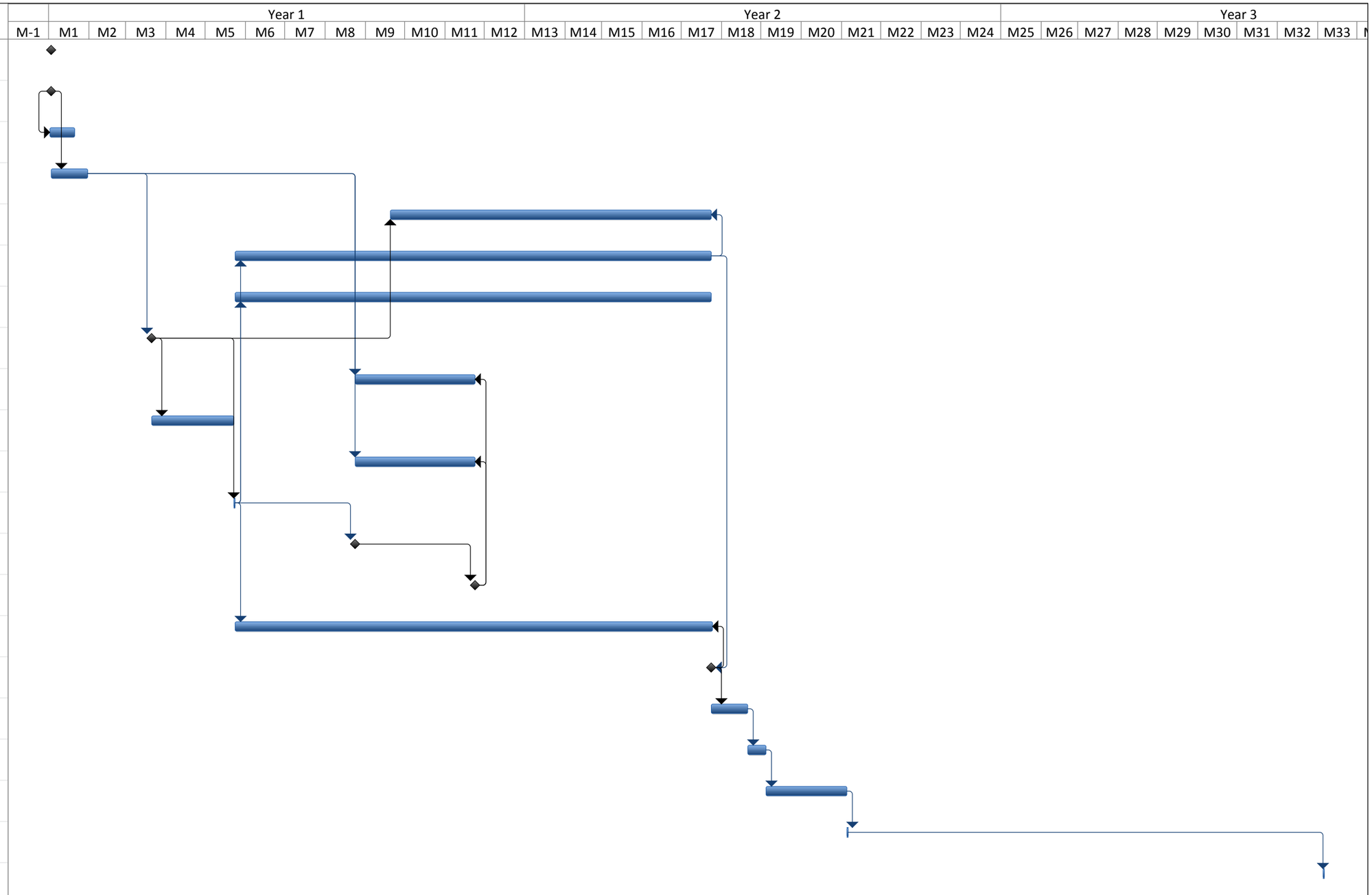
SCOPE OF WORK
Widen SR 89 to four-lane facility, from Butterfield Road to the roundabout at Road 4N. Typical section per Urban Highway Typical Section UA as shown in Figure 306.4A of the ADOT Roadway Design Guidelines (RDG), modified to have an eight-foot raised median and 5-foot sidewalk on both sides. • Remove approximately 2,800 feet of concrete curb and gutter. • Remove approximately 28,100 square yards of existing asphaltic concrete pavement, including saw cutting. • Construct approximately 33,100 square yards of new asphaltic concrete pavement. • Construct approximately 11,200 feet of concrete curb and 9,600 feet of concrete curb and gutter. • Construct 54,500 square feet of 5-foot wide concrete sidewalk. • Reconstruct 19 driveways (ADOT standard detail C-05.20). • Construct 22 PROWAG compliant sidewalk ramps. • Provide approximately 650 square yards of median paving. • Provide approximately 37,300 feet of pavement marking on new pavement. • Provide landscaping, including decomposed granite in median and adjacent to sidewalk. • Approximately 11,400 cubic yards of earthwork.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• Construct two-lane roundabout at intersection of SR 89 and Road 3N. Instead, retiming the existing signal with a protected left-turn phase will be implemented. If the countermeasure underperforms, a roundabout may be reconsidered. If roundabout constructed at Road 3N, then construct raised median at Butterfield Road to make it right-in right-out only. • Construct roundabout at Road 3 1/2N, which is to be considered with future development. • Provide detached sidewalk in lieu of attached sidewalk (could be included during project design). • Driveway consolidation was considered, but was not included due to anticipated implementation challenges. • Driveway elimination was considered, but was not included due to anticipated implementation challenges.

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ATTACHMENT 4 – PROJECT SCHEDULE

ID	Task Name
1	Pre-Design/Scoping
2	Notice to Proceed (NTP)
3	Project Start-up/Kick-off
4	Mapping/Survey
5	Environmental Clearance
6	Right-of-Way Clearance
7	Utility and Railroad Clearance
8	Design Stage I
9	Geo. Test and Report
10	Value Analysis
11	Material Memo
12	Design Stage II
13	Design Stage III
14	Design Stage IV
15	Traffic Control Plans
16	Final PS & E
17	C&S Finalize Bid Package & Clearance
18	Bid Advertisement Package - Ready
19	Bid Advertisement Date
20	Bid Award Date
21	Facilities Open



Project: SR 89 Butterfield Rd to Ro
Date: Fri 3/31/17

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		

ATTACHMENT 5 – ITEMIZED COST ESTIMATE

Butterfield Road to Road 3N	MP	329.00	to MP	329.20
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	6,653	$2.00	$13,400
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	739	$8.00	$6,000
SAW CUTTING	L.FT.	1,130	$1.50	$1,700
EARTHWORK	L.SUM	1	$3,856.00	$3,900
ASPHALT SURFACE COURSE	SQ.YD.	6,653	$6.00	$40,000
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	277	$50.00	$13,900
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	6,864	$0.50	$3,500
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$20,000.00	$20,000
CONCRETE CURB	L.FT.	1,219	$20.00	$24,400
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	10,129	$3.00	$30,400
CONCRETE SIDEWALK RAMP	EACH	12	$2,000.00	$24,000
CONCRETE DRIVEWAY	SQ.FT.	815	$15.00	$12,300
MEDIAN PAVING	SQ.YD.	553	$60.00	$33,200
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$226,700**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$18,200.00	$18,200
Quality Control (1%)	COST	1.00%	$2,300.00	$2,300
Construction Surveying (1.5%)	COST	1.50%	$3,500.00	$3,500
Erosion Control (1%)	COST	1.00%	$2,300.00	$2,300
Mobilization (12%)	COST	12.00%	$27,300.00	$27,300
			PROJECTWIDE SUBTOTAL	**$53,600**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$84,100.00	$84,100
			PROJECTWIDE TOTAL	**$137,700**
Construction Engineering (9%)	COST	9.00%	$32,800.00	$32,800
Construction Contingencies (5%)	COST	5.00%	$18,300.00	$18,300
Engineering Design (10%)	COST	10.00%	$36,500.00	$36,500
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$87,600**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$37,800.00	$37,800

SUMMARY

ITEM TOTAL	**$226,700**
PROJECTWIDE TOTAL	**$137,700**
OTHER COST TOTAL	**$87,600**
ICAP	**$37,800**
TOTAL	**$490,000**

Road 3N to Road 4N	MP	329.20	to MP	330.16
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	2,800	$5.00	$14,000
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	27,314	$8.00	$218,600
SAW CUTTING	L.FT.	301	$1.50	$500
EARTHWORK	L.SUM	1	$87,100.00	$87,100
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	32,820	$50.00	$1,641,000
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	30,413	$0.50	$15,300
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$25,000.00	$25,000
CONCRETE CURB	L.FT.	10,000	$20.00	$200,000
CONCRETE CURB AND GUTTER	L.FT.	9,551	$15.00	$143,300
CONCRETE SIDEWALK	SQ.FT.	44,388	$3.00	$133,200
CONCRETE SIDEWALK RAMP	EACH	10	$2,000.00	$20,000
CONCRETE DRIVEWAY	SQ.FT.	9,268	$15.00	$139,100
MEDIAN PAVING	SQ.YD.	118	$60.00	$7,100
STORM SEWER ALLOWANCE	L.SUM	1	$82,000.00	$82,000
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$2,726,200**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$218,100.00	$218,100
Quality Control (1%)	COST	1.00%	$27,300.00	$27,300
Construction Surveying (1.5%)	COST	1.50%	$40,900.00	$40,900
Erosion Control (1%)	COST	1.00%	$27,300.00	$27,300
Mobilization (12%)	COST	12.00%	$327,200.00	$327,200
			PROJECTWIDE SUBTOTAL	**$640,800**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$1,010,100.00	$1,010,100
			PROJECTWIDE TOTAL	**$1,650,900**
Construction Engineering (9%)	COST	9.00%	$394,000.00	$394,000
Construction Contingencies (5%)	COST	5.00%	$218,900.00	$218,900
Engineering Design (10%)	COST	10.00%	$437,800.00	$437,800
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$1,050,700**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$453,800.00	$453,800

SUMMARY

ITEM TOTAL	**$2,726,200**
PROJECTWIDE TOTAL	**$1,650,900**
OTHER COST TOTAL	**$1,050,700**
ICAP	**$453,800**
TOTAL	**$5,890,000**

Road 3N Roundabout	MP	329.20	to MP	329.20
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	2,600	$5.00	$13,000
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	7,200	$8.00	$57,600
SAW CUTTING	L.FT.	288	$1.50	$500
EARTHWORK	L.SUM	1	$19,424.00	$19,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	6,899	$50.00	$345,000
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	3,000	$0.50	$1,500
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	1,905	$20.00	$38,100
CONCRETE CURB AND GUTTER	L.FT.	2,400	$15.00	$36,000
CONCRETE SIDEWALK	SQ.FT.	10,685	$3.00	$32,100
CONCRETE SIDEWALK RAMP	EACH	16	$2,000.00	$32,000
CONCRETE DRIVEWAY	SQ.FT.	2,746	$15.00	$41,200
MEDIAN PAVING	SQ.YD.	948	$60.00	$56,900
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	317	$135.00	$42,800
			ITEM TOTAL	**$931,200**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$74,500.00	$74,500
Quality Control (1%)	COST	1.00%	$9,400.00	$9,400
Construction Surveying (1.5%)	COST	1.50%	$14,000.00	$14,000
Erosion Control (1%)	COST	1.00%	$9,400.00	$9,400
Mobilization (12%)	COST	12.00%	$111,800.00	$111,800
			PROJECTWIDE SUBTOTAL	**$219,100**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$345,100.00	$345,100
			PROJECTWIDE TOTAL	**$564,200**
Construction Engineering (9%)	COST	9.00%	$134,600.00	$134,600
Construction Contingencies (5%)	COST	5.00%	$74,800.00	$74,800
Engineering Design (10%)	COST	10.00%	$149,600.00	$149,600
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$359,000**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$155,100.00	$155,100

SUMMARY

ITEM TOTAL	**$931,200**
PROJECTWIDE TOTAL	**$564,200**
OTHER COST TOTAL	**$359,000**
ICAP	**$155,100**
TOTAL	**$2,010,000**

PLANNING ASSISTANCE FOR RURAL AREAS
PRELIMINARY SCOPING FIELD REVIEW REPORT

The purpose of Preliminary Scoping (Pre-Scoping) is to more accurately develop a project's Scope of Work (SOW), Schedule, and Itemized Cost Estimate prior to programming a project in a Transportation Improvement Program (TIP). This process will help to streamline project design by reducing upfront work, scope changes, project delays, and TIP Amendments.

The information gathered from the Pre-Scoping Field Review Report will be used to develop the project's SOW, Schedule, and Itemized Cost Estimate, which will be summarized in the Pre-Scoping Report.

Pre-Scoping Field Review Forms are to be completed by functional groups responsible for each area as needed (based on the project scope). Not all projects will require all Field Review Forms to be filled out.

Field Review Form	Name	Date Completed
Background Data	Benjamin Barkan	January 10, 2017
Bridge – Design		
Bridge – Hydraulics / Drainage	Dan Gabiou	January 25, 2017
District – Constructability		
District – Maintenance		
Environmental	Dan Gabiou and Justin Hoppmann	January 25, 2017
Geotechnical		
Pavement / Materials		
Right-of-Way		
Roadway / Drainage	Roger McCormick	January 25, 2017
Traffic / Safety	Dan Gabiou	January 25, 2017
Utilities		

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

23 USC 409 Disclaimer:
Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

BACKGROUND DATA
(To be completed prior to KOM and Field Review)

Previous Projects

ADOT / LPA / Tribal Project Number	Begin Milepost / Cross Street	End Milepost / Cross Street	Length (miles)	As-Built Date	Description
H833001C				09/2016	Roundabout Construction at Perkinsville Road and SR 89
H827801C				09/2016	Roundabout Construction at Road 4 North and SR 89

ITEM	YES	NO	If Yes, Describe (or see below)
Past Study Completed?	☒	☐	**CYMPO Title VI Plan, June 2016** No protected populations identified. **AASHTO U.S. Bicycle Route System, August 2015** U.S. Bicycle Route (USBR 79) recommended to go from Prescott to I-40 along SR 89. **CYMPO Regional Transportation Plan Update 2040, April 2015** Reprioritization of transportation investments through the 2040 planning horizon. RTP indicates widening to six lanes from Deep Well Ranch Road to Center Street is included in the FY2025 to FY2040 planning horizon; this segment is south of the Study Area. The Great Western Extension is included in the FY2025 to FY 2040 planning horizon and is a new two-lane facility located north of SR 89A and will intersect SR 89 near Road 5 South. **State Route 89 Access Management Plan, June 1997** One-mile spacing of major, signalized intersections and non-major intersections with right-in, right-out, and left-in access at half-mile spacing. Driveways with direct access to SR 89 consolidated or eliminated when possible. **Chino Valley Extension Study, February 2009** New four-lane access controlled road, Chino Valley Extension, to serve as an alternate route for SR 89 in Chino Valley and Paulden areas (recommended intersection approximately 1 mile south of Big Chino Road).
Project included in TIP?	☐	☒	Not programmed
Is AADT available?	☒	☐	See below
Is crash data available?	☒	☐	**Corridor Summary:** SR 89, Perkinsville Road to Road 4N. 51 crashes reported in a 5-year study period (2011 thru 2015). 7 angle crashes, 6 left turn crashes, 16 rear end crashes, 5 run off the road crashes, 10 sideswipe crashes, 1 animal crash, 2 single vehicle crashes, and 4 other crashes that do not fall into these categories. No fatal injury, but 5 crashes resulted in incapacitating injury.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017

Project Limits: P1A and P2-Perkinsville Road to Road 4N

Known Transit needs?	☐	☒	
Known Freight needs?	☒	☐	Potential increase in freight traffic once Hell Canyon Bridge is replaced.
Known Railroad needs?	☐	☒	
Known Airport needs?	☐	☒	
Known Bike needs?	☒	☐	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Known Pedestrian / ADA needs?	☒	☐	Provide new sidewalks. Update pedestrian facilities to be PROWAG compliant. Investigate detached sidewalk.
Other needs?	☒	☐	Accommodate Town emergency services located west of SR89 on Road 3N, utility relocations, traffic signal retiming.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

BMP 328.20 Road 2 North			EMP 329.20 Road 3 North		
	NB AADT	SB AADT	AADT	T Factor %	Future 2035 AADT
2015	9,545	10,142	19,687	7.3	31,499
2014	9,168	9,730	18,898	6.5	N/A
2013	9,130	9,701	18,850	7.6	N/A
2012	9,174	9,567	18,599	7.9	N/A
2011	9,113	9,278	18,391	10.0	N/A

BMP 329.20 Road 3 North			EMP 330.20 Road 4 North		
	NB AADT	SB AADT	AADT	T Factor %	Future 2035 AADT
2015	6,006	6,028	12,034	8.0	19,254
2014	5,464	5,494	10,959	7.3	N/A
2013	5,504	5,532	11,035	7.9	N/A
2012	3,255	5,575	10,036	7.5	N/A
2011	5,378	5,316	10,695	12.0	N/A

Source: *https://www.azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic*

Traffic Counts were conducted for this study March 23, 2016. Daily traffic volumes were approximately 12,900 just north of Road 3N.

Study forecast projected 2036 AADT of 16,538 vpd.

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

BRIDGE DESIGN FIELD REVIEW FORM

BRIDGE NO._____

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Replace Bridge	☐	☒	☐	
Span Bridge	☐	☒	☐	
Box Culvert	☐	☒	☐	
Unique Structure	☐	☒	☐	
Replace Bridge Deck	☐	☒	☐	
Widen	☐	☒	☐	
Rail/Sidewalk Barrier	☐	☒	☐	
Corrosion Protection	☐	☒	☐	
Structural Repairs	☐	☒	☐	
Deck	☐	☒	☐	
Superstructure	☐	☒	☐	
Substructure	☐	☒	☐	
Concrete Wearing Course	☐	☒	☐	
Expansion Joints	☐	☒	☐	
Approach Panels	☐	☒	☐	
Erosion/Scour Protection	☐	☒	☐	
Painting	☐	☒	☐	
Over Water?	☐	☒	☐	
Utility accommodation	☐	☒	☐	
Need Asbestos Assessed?	☐	☒	☐	
Removals	☐	☒	☐	
Br Inventory Sheet indicates that Accelerated Bridge Construction (ABC) should be considered?	☐	☒	☐	
Other	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

BRIDGE HYDRAULICS / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			Struc. # If any	RP	LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE			
Mainline Culverts ☐ Repair ☐ Line ☐ Replace ☒ Extend	☒	☐	☐			Extend culvert between Road 3½N and Commercial Way to accommodate roadway widening.
Sideline Culverts ☐ Replace ☐ Extend	☐	☐	☒			Culverts under drives exist, but will likely not be disturbed. Depends on final grading.
Tile	☐	☒	☐			
Storm Sewer	☐	☐	☒			Storm drain system identified under northbound lanes, north of Road 3N. Outlet may need adjusted to accommodate widening.
Erosion Repairs	☐	☒	☐			
Waterway analysis	☐	☒	☐			
Risk Assessment	☐	☒	☐			
Ditch Hearing	☐	☒	☐			
Special Structures	☐	☒	☐			
Weirs	☐	☒	☐			
Vortex	☐	☒	☐			
Fish Passage	☐	☒	☐			
Ponds	☐	☒	☐			
Other:	☐	☒	☐			

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

DISTRICT - CONSTRUCTION FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Detour[a]	☐	☒	☐	
Temporary Construction[a]	☒	☐	☐	TCEs may be required at existing roadway intersections, depending on limits of paving and sidewalk improvements.
Staging[a]	☐	☐	☒	Unknown at this time.
Stockpiling	☐	☐	☒	Unknown at this time.
Innovative Contracting	☐	☒	☐	
Traffic Control	☒	☐	☐	Construction phasing will be required to accommodate daily traffic and emergency services.
Other	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

DISTRICT - MAINTENANCE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Striping	☒	☐	☐	
Signing	☒	☐	☐	
Lighting	☐	☐	☒	Unknown at this time.
Curb & Gutter	☒	☐	☐	
Low gravel shoulder correction	☐	☒	☐	
Guard Rail Repair	☐	☒	☐	
Fencing	☐	☒	☐	
Noisewall	☐	☒	☐	
Drainage Repair	☐	☐	☒	Basin on SB side of SR 89 in front of local business (Fix Bros Auto)
Erosion Area Correction	☐	☒	☐	
Flooding Area Correction	☐	☐	☐	
Snow Trap, Storage, Icing Correction	☐	☐	☒	Unknown at this time.
RWIS	☐	☐	☒	Unknown at this time.
Anti-Icing System	☐	☒	☐	
Frost Heave Correction	☐	☒	☐	
Rest Area Work	☐	☒	☐	
Landscaping	☐	☐	☒	Unknown at this time.
Millings needed	☐	☐	☒	Unknown at this time.
Other salvage items	☐	☐	☒	Unknown at this time.
Other:	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

ENVIRONMENTAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
4(f) / 6(f) sites	☐	☐	☒	A potentially historic house structure is located on the NW corner of Road 3N and SR 89.
Extensive Cultural/Historical Work	☐	☐	☒	Impacts to potentially historic adjacent properties would need to be evaluated to determine level of effort.
Title VI/Environmental Justice Populations	☐	☒	☐	The project area has a higher percentage of Hispanic residents than the surrounding county; however, no disproportionate impacts are anticipated.
Noise Concerns	☒	☐	☐	There are several adjacent properties with noise sensitive uses (residential, churches, etc) Because the project would increase capacity, a noise analysis would need to be completed.
Jurisdictional Waters or Wetlands	☐	☒	☐	None present in the project area.
Floodplain	☐	☒	☐	The project falls within Flood Zone X per FEMA mapping, or areas determined to be outside the 0.2% annual chance floodplain.
State/Federal T&E Species	☐	☒	☐	No suitable habitat is located in the project area.
Wildlife Crossing Concerns	☐	☐	☐	No known concerns in the project area.
Hazmat or Contaminated site	☐	☒	☐	There are no known spills or incidents within the project area. Adjacent properties include uses such as automotive repair which frequently utilize solvent and petroleum products. Additionally, one property is occupied by numerous aboveground storage tanks.
Prime or Unique Farmland	☐	☒	☐	Soils within the project area are of a type which is considered Prime Farmland if irrigated. Currently no actively irrigated farming occurs adjacent to the project area.
Air Quality Nonattainment or Maintenance Area	☐	☒	☐	No known concerns in the project area.
Noxious or Invasive Species	☐	☒	☐	No known concerns in the project area.
Visual Quality Concerns	☐	☒	☐	No known concerns in the project area.
Public Involvement Required	☒	☐	☐	Due to business/residential impacts of access management improvements.
Significant Environmental Impacts	☐	☒	☐	
Avoidance Areas	☒	☐	☐	Avoidance of the potentially historic structure on the NW corner of Road 3N is recommended.
Other	☐	☐	☐	

Anticipated NEPA Clearance Type	Categorical Exclusion (CE) ☒	Environmental Assessment (EA) ☐	Environmental Impact Statement (EIS) ☐	N/A (No federal funds anticipated) ☐

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017

Project Limits: P1A and P2-Perkinsville Road to Road 4N

Anticipated Permits Needed	Section 404 Permit: Nationwide Permit ☐ Individual Permit ☐	Individual Section 401 Certification ☐	Section 402 Permit: AZPDES ☒ NPDES ☐

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

GEOTECHNICAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
Will geotechnical borings be required?	☒	☐	☐	Est Drilling/Excavation Depth: unknown at this time.
Will rock coring be required?	☐	☒	☐	
Will test pits be required?	☐	☒	☐	Est Drilling/Excavation Depth:
Is site accessible by a 4-wheel vehicle, backhoe, or trackhoe?	☒	☐	☐	
Will a seismic refraction survey be required?	☐	☐	☒	Unknown at this time.
Will geologic mapping be required?	☐	☐	☒	Unknown at this time.
Will soil/rock lab testing be required?	☐	☐	☒	Unknown at this time.
Will geotechnical investigation require a separate Environmental Clearance?	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

PAVEMENT / MATERIALS FIELD REVIEW FORM

ITEM		ITEM NEEDED			LOCATION / QUANTITY / NOTES
		YES	NO	MAYBE	
Hot Mix Asphaltic Concrete Pavement	Minor Rehab/Preventative Maint (Chip Seal, Slurry Seal, etc.)	☐	☒	☐	*(include lane width)*
	Major Rehab (Mill & Replace Only)	☒	☐	☐	Through existing 4-lane section.
	Major Rehab (Mill, Replace & Overlay)	☐	☒	☐	
	Major Rehab (Overlay Only)	☐	☒	☐	
	Reconstruction	☐	☒	☐	*(include lane width)*
	Widening/Adding Turn Lanes	☒	☐	☐	*Through 2-lane section and intersections.*
	Pavement Core	☒	☐	☐	
	Falling Weight Deflectometer Test	☐	☒	☐	
Portland Cement Concrete Pavement	Joint Repairs	☐	☒	☐	
	Dowel Bars	☐	☒	☐	
	Major CPR	☐	☒	☐	
	Minor CPR	☐	☒	☐	
	Widening/Turn Lanes	☐	☒	☐	
	Pavement Core	☐	☒	☐	
	Other:	☐	☒	☐	
Sub-surface	Aggregate Base Improvement	☐	☐	☒	Unknown at this time.
	Subgrade Improvement	☐	☐	☒	Unknown at this time.
	Other:	☐	☐	☐	
Shl-der	Shoulder Work	☐	☒	☐	*(include shoulder width)*
	Other:	☐	☐	☐	
Edge Drains	Edge Drain Video Insp	☐	☒	☐	
	Edge Drain Flushing	☐	☒	☐	
	New Edge Drains	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

RIGHT-OF-WAY FIELD REVIEW FORM

Location	Existing ROW Width	Owner	Comments
South of Rd 3N	100 feet	ADOT	
North of Rd 3N	150 feet to 200 feet	ADOT	ROW on west side jogs over 750 feet north of Road 3N

List all adjacent land owners within the project limits	Private owners

ITEM	YES	NO	MAYBE	PARCEL # / LOCATION / QUANTITY / NOTES
Potential Full-Parcel ROW Take	☐	☒	☐	
Potential Partial-Parcel ROW Take	☐	☒	☐	
Access Issues	☐	☒	☐	
Temporary Construction Easement (TCE) required	☒	☐	☐	
Drainage Easement required	☐	☐	☒	Unknown at this time.
Access Easement required	☐	☐	☒	Unknown at this time.
Plats needed	☐	☒	☐	
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

ROADWAY / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Design Exception	☐	☒	☐	
CSS Design Flexibility	☐	☐	☒	Limit impacts to the NW corner of Road 3N intersection.
Hor. Curve Correction	☐	☒	☐	
Vert. Curve Correction	☐	☒	☐	
Crown Correction	☐	☒	☐	
Super Correction	☐	☒	☐	
Side Slope Correction	☐	☒	☐	
Shlder slope correction	☐	☒	☐	
Flatten Entrance Slopes	☐	☒	☐	
Sight-line Obstr. Correction	☐	☒	☐	
Guardrail	☐	☐	☒	Unknown at this time.
Curb & Gutter	☒	☐	☐	
Retaining Walls	☐	☐	☒	Unknown at this time.
Spillway	☐	☒	☐	
Downdrain	☐	☒	☐	
Scuppers	☐	☐	☒	Unknown at this time.
69kV lines Steel Poles	☐	☐	☒	
Other:	☐	☐	☐	

Comments and Risk Identification:

When considering pavement widening, a few locations that have existing utility poles could possibly need relocation due to lying within the clear zone once the road is expanded.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

TRAFFIC / SAFETY FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Bicycle Countermeasures				
Bike Lane	☐	☒	☐	
Pavement Markings / Signs	☐	☐	☒	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Shared Use Path	☐	☒	☐	
Other:	☒	☐	☐	Route is part of National bike route. Maintain shoulder for design.
Curve Countermeasures				
Enhanced Delineation and Friction for Horizontal Curve	☐	☒	☐	
Curve Warning Signs	☐	☒	☐	
Other:	☐	☐	☐	
Intersection Countermeasures				
Access Control	☒	☐	☐	Raised median.
Pedestrian Phasing	☐	☐	☒	Unknown at this time.
Pedestrian Signal/ Countdown Signal	☐	☐	☒	Unknown at this time.
Offset/lengthen turn lane	☐	☒	☐	
Phasing/protected left turn	☒	☐	☐	Adjust traffic signal phasing/timing.
Roundabout	☒	☐	☐	Long-term roundabout at Road 3N to allow business/residential access. Roundabout at 3 1/2N. If Road 3N roundabout is constructed, then close median at Butterfield Road.
Signal Backplates with Retroreflective Borders	☐	☐	☒	Unknown at this time.
Stop Bar	☒	☐	☐	
Other:	☐	☐	☒	Loop boxes for through lanes on NB 89, south of intersection at Road 3N, are too far from intersection and need to be moved closer.
Lane / Roadway Departure Countermeasures				
Longitudinal Rumble Strips / Stripes on 2-Lane Roads (shoulder & centerline)	☐	☒	☐	
Raised Median Barrier	☐	☒	☐	
Safety Edge	☐	☒	☐	
Shoulder	☐	☒	☐	
Other:	☐	☐	☐	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Pedestrian Countermeasures				
ADA Improvement	☒	☐	☐	Update ADA accommodations to be PROWAG compliant.
Crosswalk	☐	☐	☒	Unknown at this time.
Median and Ped Xing Island (urban / suburban area)	☐	☒	☐	
Pedestrian Hybrid Beacon	☐	☒	☐	
Pedestrian Warning Sign (Ped Xing, No Right on Red, Yield to Peds)	☐	☒	☐	
Road Diet	☐	☒	☐	
Sidewalk	☒	☐	☐	New 5-foot sidewalks on both sides of the road to be paid for by Chino Valley.
Traffic Calming	☐	☒	☐	
Widen Shoulder	☐	☒	☐	
Other:	☐	☐	☐	
Railroad Crossing Countermeasures				
Active Advanced Warning Sign	☐	☒	☐	
Flashing Light Signals	☐	☒	☐	
Gates (Automated, Channelized, Four-Quadrant)	☐	☒	☐	
Pavement Markings	☐	☒	☐	
Signage	☐	☒	☐	
Train Detection System	☐	☒	☐	
Traffic Signal	☐	☒	☐	
Warning Bell	☐	☒	☐	
Wayside Horn System	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P1A and P2-Perkinsville Road to Road 4N

UTILITIES
FIELD REVIEW FORM

(1) Info Source	(2) FACILITY OWNER	(3) FACILITY TYPE	(4) LOCATION	(5) Impact	(6) ROW /TCE	(7) REMARKS/ REASON FOR CONFLICT
B&C-Bluestake	Arizona Public Services – Precott Carby Hrober (602) 493-4225	ELECTRIC	Along SB SR 89, ranges from 10'-20' from EOP, Several 5" underground lines run across SR 89 about 55' north of Perkinsville Rd., Overhead lines cross SR 89 at Adams Dr., Road 3N, Road 3-1/2N, and Road 4N, Overhead line crosses SR 89 approximately 250' north of Road 3N, 200' of OH power along NB SR 89 beginning 250' north of Road 3N, Secondary overhead line crosses SR 89 approximately 750' north of Road 3N, Overhead primary line crosses SR 89 approximately 900' north of Road 3N, Overhead primary line crosses SR 89 approximately 100' south of Industrial Dr., Overhead primary along NB SR 89 from just south of Industrial Dr. to just south of Road 4N, 12 5" underground lines along NB SR 89 pick up where OH primary ends south of Road 4N and extends to Road 4N, 4 5" underground lines along NB SR 89 extend from Road 4N to just north of Road 4N	Y		Potential for pole relocation. OH utility pole relocation required on SB side of SR 89 from Road 3N to Road 4N.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

B&C-Bluestake	Arizona Department of Transportation – Maricopa Trevor Eltringham (928) 308-3361	ELECTRIC	New underground lighting conduit and pull boxes run around footprint of roundabout at Perkinsville Road, New underground lighting conduit runs along each side of SR 89 for about 200' north from Perkinsville Road, Underground conduit runs along SB SR 89 for about 400' south from Road 3N and along NB SR 89 for about 400' north from Road 3N, New underground lighting conduit and pull boxes run around footprint of roundabout at Road 4N, New underground lighting conduit runs along each side of SR 89 for about 200' north from Road 4N,	Y		Conflict north of Road 3N. Potential for utility relocation.
B&C-Bluestake	Arizona Department of Transportation – Maricopa Amber Galindo-Zarate (928) 759-2426 x3615	CULVERT, STORM DRAIN	Multiple culverts run parallel to SR 89 under driveways from Road 3N to Road 4N. Multiple culverts cross SR 89 between Perkinsville Road and Road 4N. Storm drain runs along SB SR 89 from south of Road 3N to north of Road 3N and connects at least 2 manholes, then outlets to ditch north of Road 3N on SB side.	Y		Conflict with roadway widening. Potential for utility relocation.
C-Bluestake	Cable One – Prescott Johnny Cedillo (928) 237-6874	CATV	3 cables ranging from 1/4" to 3/4" run along SB EOP of SR 89 from Perkinsville Road to Road 3N, 3/4" main carrier cable runs along SB EOP of SR 89 from Road 3N to Road 4N, 1/4"-1/2" fiber runs along center of SR 89 connecting manholes from Road 3N to Road 4N, 3/4" main carrier cable crosses SR 89 at Road 3N, 1/4" fiber crosses SR 89 at Road 3N, 1/2" feeder cable crosses SR 89 at Road 3N, 1/2" feeder cable crosses SR 89 just north of Road 3N, 3/4" main carrier cable crosses SR 89 just south of Palomino Rd., 2 3/4" main carrier cables cross SR 89 at Road 4N, All utilities underground in vicinity of new roundabout at SR 89/Perkinsville Rd., rise above ground after clearing roundabout construction limits.	Y		Conflict with roadway widening. Potential for utility relocation.
C-Bluestake	CTLQL – CenturyLink USIC DISPATCH CENTER (800) 778-9140	COAXIAL, FIBER	No response	N/A		No Response

C-Bluestake	UniSource Energy Services – Prescott Aaron McCoy (928) 771-7233	GAS	4" underground gas line runs along NB SR 89 from Perkinsville Rd. to Adams Dr., 4" underground gas line crosses SR 89 at Butterfield Rd., 2" high pressure gas line runs along NB SR 89 from Butterfield Rd. to Road 3N, 2" gas main runs along NB SR 89 from Road 3N to about 1000' north of Road 3N,	Y		Potential conflict with roundabouts and subsequent utility relocation.
C-Bluestake	Chino Valley Irrigation District (928) 636-4535	IRRIGATION	No response	N/A		No Response

1) **Use A – Permit Log, B – Field Observation, C – Utility/Other**
2) **Facility Owner (company/agency) name and contact information. Note: this does not include drainage features located underground**
3) **Type and Size of facility**
4) **Use Milepost or Stationing. Last resort describe**
5) **Y – Likely to impact facility with project N – Not likely to impact facility**
6) **Y – If relocation, likely to need TCE or ROW N- No**
7) **Pertinent Information include potential relocation cost, schedule impacts, coring requirements, potential Utility Agreement notes, or other risks**

Planning Assistance for Rural Areas
PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: March 29, 2017	**ADOT Project Manager:** Dan Gabiou
Project Name: Construct NB Left-Turn Lane and SB Right-Turn Lane at Little Ranch Road	
City/Town: Community of Paulden	**County:** Yavapai
COG/MPO: Central Yavapai Metropolitan Planning Organization	**ADOT District:** Northwest District
Primary Route/Street: State Route 89	
Beginning Limit: MP 335.65	
End Limit: MP 335.88	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name: Town of Chino Valley		
LPA/Tribal Contact: Michael Lopez		
Email Address: mlopez@chinoaz.net	**Phone Number:** (928) 636-7140	
LPA/Tribal Name: Yavapai County		
LPA/Tribal Contact: Byron Jaspers		
Email Address: Byron.jaspers@yavapai.us	**Phone Number:** (928) 771-3183	
Administration: ☒ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
There is a need to address safety at the intersection of SR 89 and Little Ranch Road. Within the five year analysis period, there were five crashes at this intersection; two single vehicle, one animal, one sideswipe, and one run off the road. Four of the five crashes occurred at night. The run off the road was an incapacitating crash; the other four had no injuries. There was a fatal crash (rear end collision) shortly after the analysis period. Many of these appear to be attributable to a lack of turn lanes for turning movements to Little Ranch Road to remove slow/stopped vehicles from the high-speed mainline. In general, there is a need to reduce the number of single vehicle and nighttime collisions.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The primary purpose of the project is to provide a northbound left-turn lane and a southbound right-turn lane at Little Ranch Road, which will help to mitigate crashes near the intersection by providing a safe location for turning movements.			

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☒ Environmental
☐ Stakeholder Issues	☐ Utilities
☒ Structures & Geotech	☒ Other: Drainage

Environmental: The proposed project limits fall within a known eagle nest area near Sullivan Lake. Wildlife crossing are in the project area. Appropriate measures should be taken to avoid impacting wildlife in the area.

Structures: Structure No. 979, Big Chino Wash Bridge, is less than 800 feet north of Little Ranch Road. The structure was reconstructed in 2014 and has a deck width of 47 feet, maximum span length of 78 feet, and is 290 feet long. Turn lane improvements should be configured to eliminate the need for bridge widening. Potential rock cut/blasting will be needed north of Little Ranch Road.

Drainage: A culvert crosses SR 89 approximately 200 feet south of the intersection. Based upon conceptual design, the culvert would not need to be extended to accommodate improvements. There is a small floodplain between Sweet Valley Road and Little Ranch Road. Final design will require further drainage investigation.

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☒ HSIP	☒ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

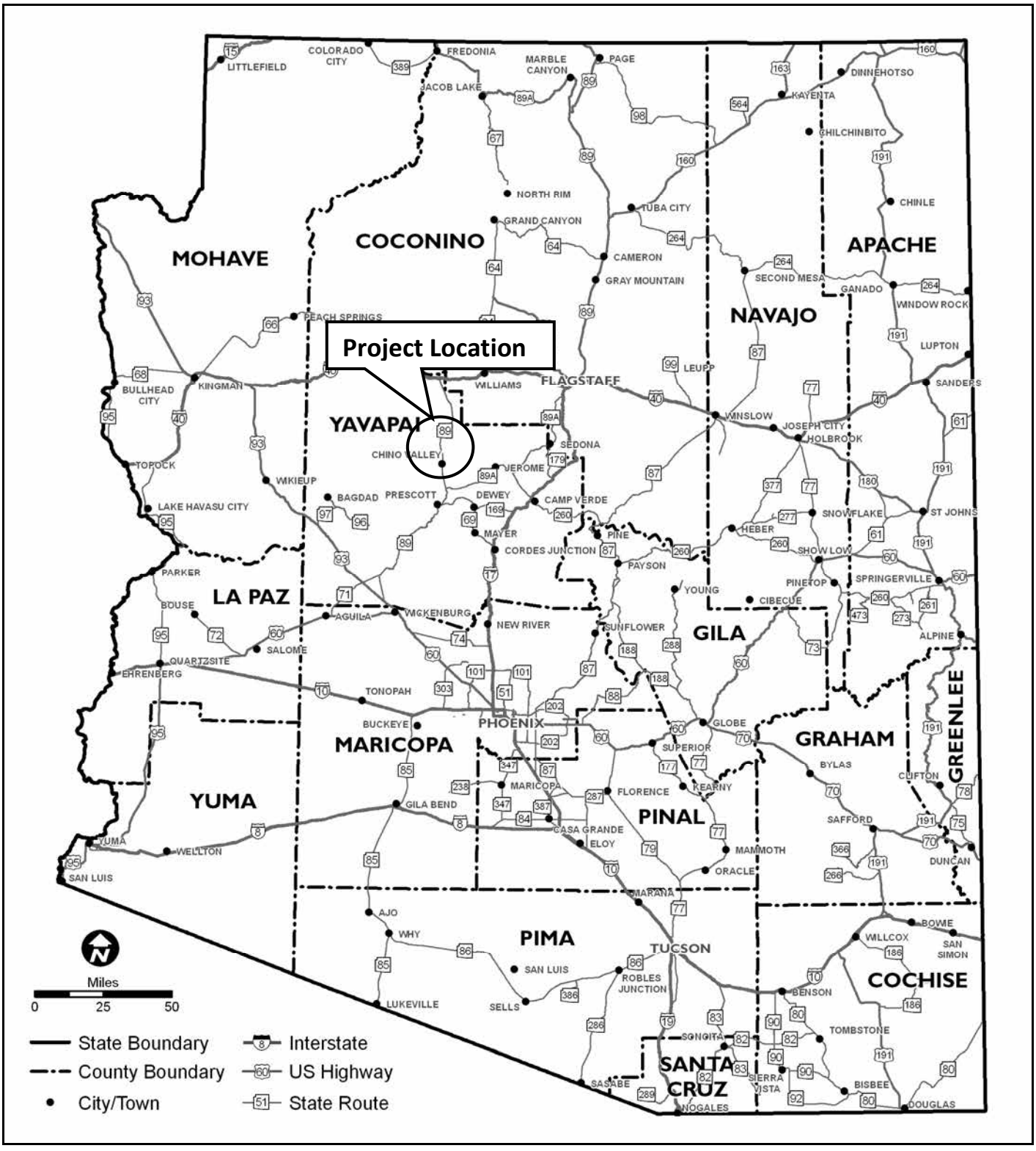
COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$28,000	$85,000	$0	$1,295,000	$1,410,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☒ Design-Bid-Build ☐ Design-Build ☐ Other
Design Program Year: FY 2021-FY 2026
Construction Program Year: FY 2022 – FY 2027

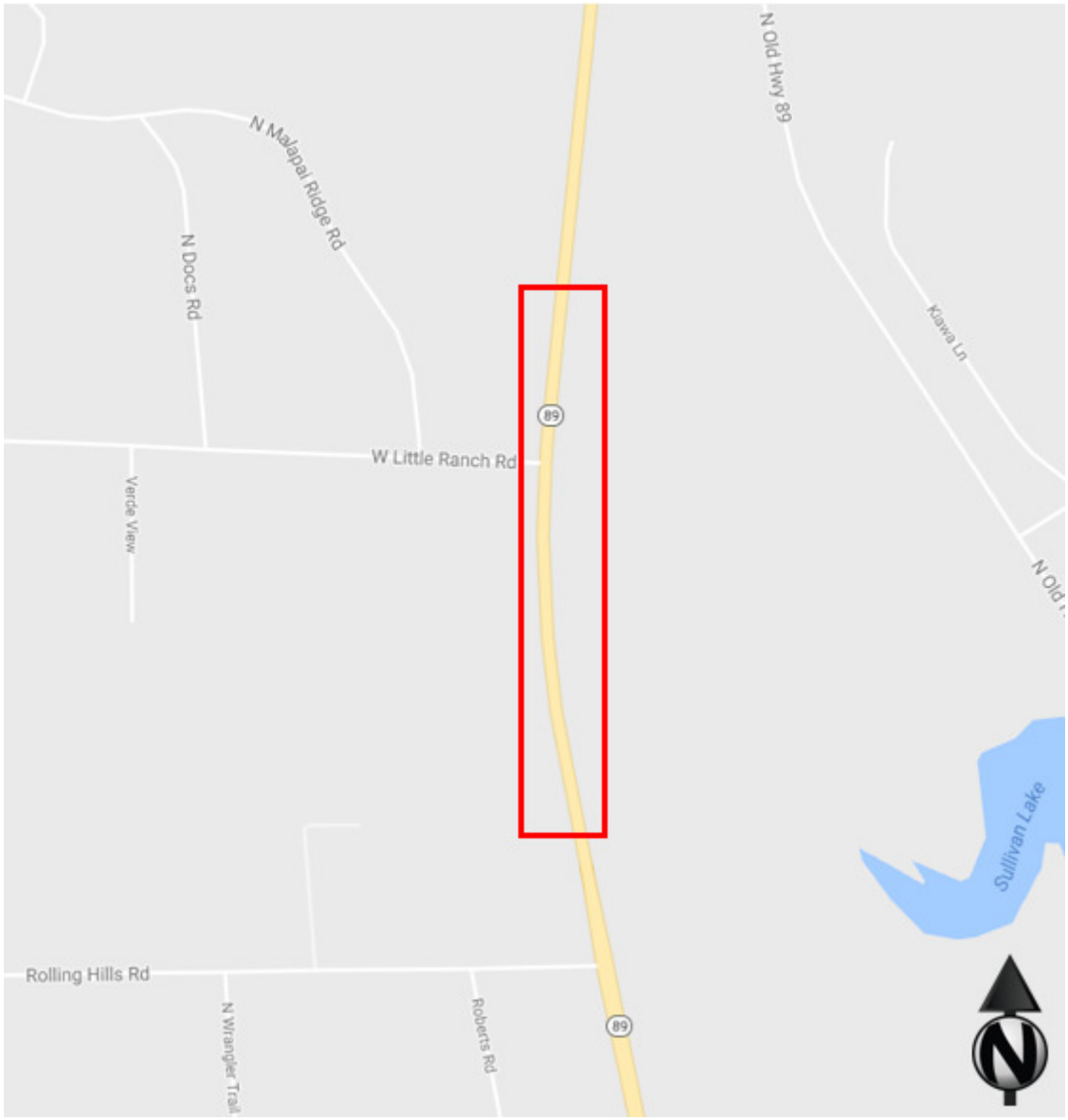
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



Project Limits: Intersection at Little Ranch Road
(MP 335.65 to MP 335.88)

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK

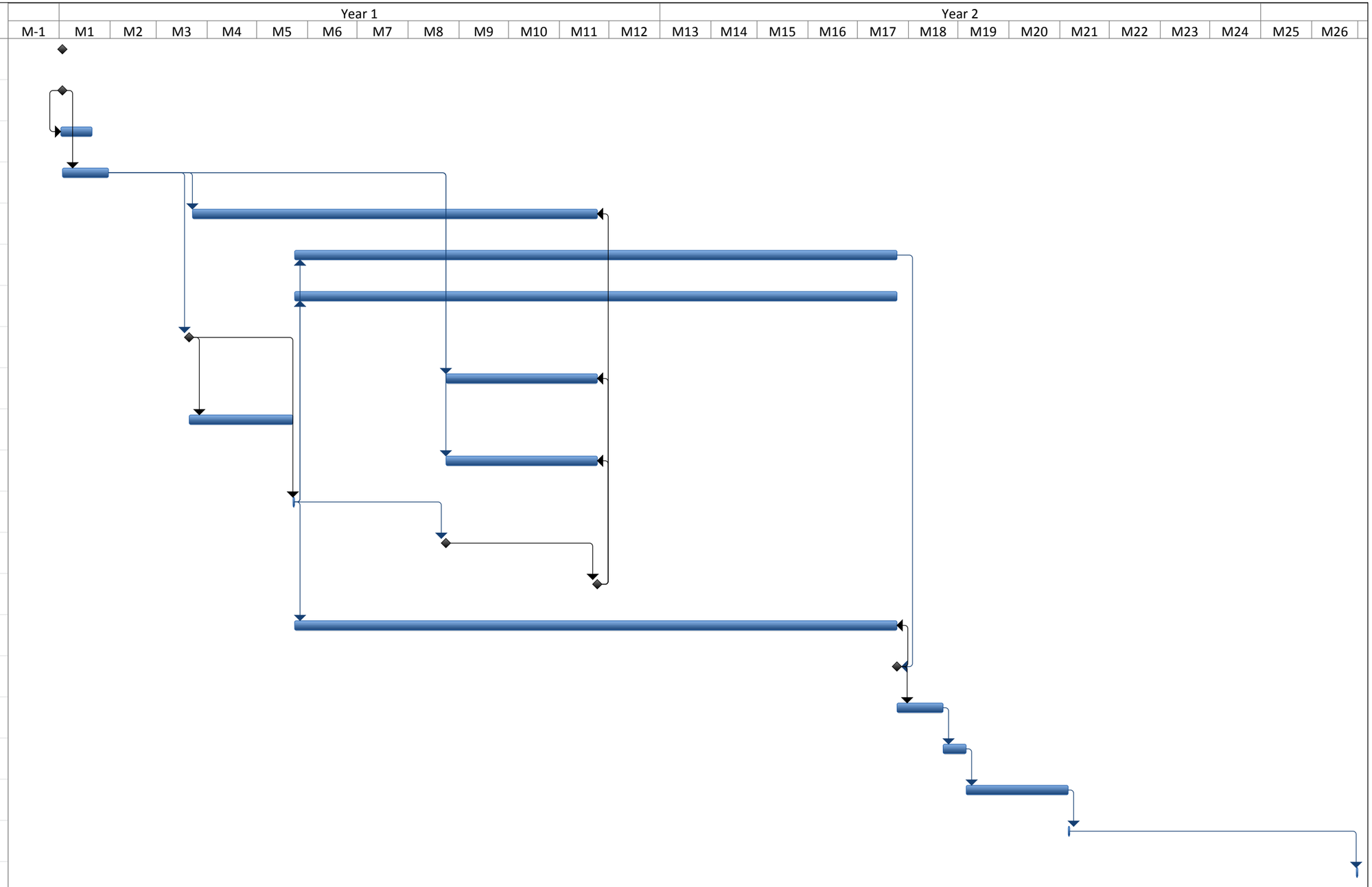
• Construct a northbound left-turn lane and a southbound right-turn lane at the intersection of SR 89 and Little Ranch Road.
  • Remove 8,500 square yards of existing asphaltic concrete pavement, including saw cutting.
  • Construct 10,400 square yards of new asphaltic concrete pavement.
  • Provide 10,100 feet of pavement marking on new pavement.
  • 5000 CY earthwork will be required to accommodate the proposed improvements.
  • Improvements extend north to Big Chino Wash Bridge (Bridge No. 979) to avoid short stretch of "old" pavement.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
Not applicable to this project.

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ATTACHMENT 4 – PROJECT SCHEDULE

ID	Task Name
1	Pre-Design/Scoping
2	Notice to Proceed (NTP)
3	Project Start-up/Kick-off
4	Mapping/Survey
5	Environmental Clearance
6	Right-of-Way Clearance
7	Utility and Railroad Clearance
8	Design Stage I
9	Geo. Test and Report
10	Value Analysis
11	Material Memo
12	Design Stage II
13	Design Stage III
14	Design Stage IV
15	Traffic Control Plans
16	Final PS & E
17	C&S Finalize Bid Package & Clearance
18	Bid Advertisement Package - Ready
19	Bid Advertisement Date
20	Bid Award Date
21	Facilities Open



Project: SR 89 Little Ranch Road L
Date: Fri 3/31/17

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		

ATTACHMENT 5 – ITEMIZED COST ESTIMATE

Little Ranch Road Left-Turn Installation	MP	335.58	to MP	335.92
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	8,311	$8.00	$66,500
SAW CUTTING	L.FT.	118	$1.50	$200
EARTHWORK	L.SUM	1	$26,481.48	$26,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	9,766	$50.00	$488,300
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	8,800	$0.50	$4,400
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	0	$0.00	$0
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$585,900**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$46,900.00	$46,900
Quality Control (1%)	COST	1.00%	$5,900.00	$5,900
Construction Surveying (1.5%)	COST	1.50%	$8,800.00	$8,800
Erosion Control (1%)	COST	1.00%	$5,900.00	$5,900
Mobilization (12%)	COST	12.00%	$70,400.00	$70,400
			PROJECTWIDE SUBTOTAL	**$137,900**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$217,200.00	$217,200
			PROJECTWIDE TOTAL	**$355,100**
Construction Engineering (9%)	COST	9.00%	$84,700.00	$84,700
Construction Contingencies (5%)	COST	5.00%	$47,100.00	$47,100
Engineering Design (10%)	COST	10.00%	$94,100.00	$94,100
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$225,900**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$97,600.00	$97,600

SUMMARY

ITEM TOTAL	**$585,900**
PROJECTWIDE TOTAL	**$355,100**
OTHER COST TOTAL	**$225,900**
ICAP	**$97,600**
TOTAL	**$1,270,000**

Little Ranch Road Right-Turn Installation	MP	335.78	to MP	335.92
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	148	$8.00	$1,200
SAW CUTTING	L.FT.	665	$1.50	$1,000
EARTHWORK	L.SUM	1	$29,296.30	$29,300
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	685	$50.00	$34,300
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	1,330	$0.50	$700
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	0	$0.00	$0
CONCRETE CURB	L.FT.	0	$20.00	$0
CONCRETE CURB AND GUTTER	L.FT.	0	$15.00	$0
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	0	$60.00	$0
STORM SEWER ALLOWANCE	L.SUM	0	$0.00	$0
TRUCK APRON	SQ.YD.	0	$135.00	$0
			ITEM TOTAL	**$66,500**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$5,400.00	$5,400
Quality Control (1%)	COST	1.00%	$700.00	$700
Construction Surveying (1.5%)	COST	1.50%	$1,000.00	$1,000
Erosion Control (1%)	COST	1.00%	$700.00	$700
Mobilization (12%)	COST	12.00%	$8,000.00	$8,000
			PROJECTWIDE SUBTOTAL	**$15,800**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$24,700.00	$24,700
			PROJECTWIDE TOTAL	**$40,500**
Construction Engineering (9%)	COST	9.00%	$9,700.00	$9,700
Construction Contingencies (5%)	COST	5.00%	$5,400.00	$5,400
Engineering Design (10%)	COST	10.00%	$10,700.00	$10,700
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$25,800**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$11,200.00	$11,200

SUMMARY

ITEM TOTAL	**$66,500**
PROJECTWIDE TOTAL	**$40,500**
OTHER COST TOTAL	**$25,800**
ICAP	**$11,200**
TOTAL	**$150,000**

PLANNING ASSISTANCE FOR RURAL AREAS
PRELIMINARY SCOPING FIELD REVIEW REPORT

The purpose of Preliminary Scoping (Pre-Scoping) is to more accurately develop a project's Scope of Work (SOW), Schedule, and Itemized Cost Estimate prior to programming a project in a Transportation Improvement Program (TIP). This process will help to streamline project design by reducing upfront work, scope changes, project delays, and TIP Amendments.

The information gathered from the Pre-Scoping Field Review Report will be used to develop the project's SOW, Schedule, and Itemized Cost Estimate, which will be summarized in the Pre-Scoping Report.

Pre-Scoping Field Review Forms are to be completed by functional groups responsible for each area as needed (based on the project scope). Not all projects will require all Field Review Forms to be filled out.

Field Review Form	Name	Date Completed
Background Data	Benjamin Barkan	January 10, 2017
Bridge – Design		
Bridge – Hydraulics / Drainage		
District – Constructability		
District – Maintenance	Dan Gabiou	January 25, 2017
Environmental	Dan Gabiou and Justin Hoppmann	January 25, 2017
Geotechnical		
Pavement / Materials		
Right-of-Way		
Roadway / Drainage	Roger McCormick	January 25, 2017
Traffic / Safety	Dan Gabiou	January 25, 2017
Utilities		

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

23 USC 409 Disclaimer:
Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

BACKGROUND DATA
(To be completed prior to KOM and Field Review)

Previous Projects

ADOT / LPA / Tribal Project Number	Begin Milepost / Cross Street	End Milepost / Cross Street	Length (miles)	As-Built Date	Description

ITEM	YES	NO	If Yes, Describe (or see below)
Past Study Completed?	☒	☐	**CYMPO Title VI Plan, June 2016** No protected populations identified. **AASHTO U.S. Bicycle Route System, August 2015** U.S. Bicycle Route (USBR 79) recommended to go from Prescott to I-40 along SR 89. **CYMPO Regional Transportation Plan Update 2040, April 2015** Reprioritization of transportation investments through the 2040 planning horizon. RTP indicates widening to six lanes from Deep Well Ranch Road to Center Street is included in the FY2025 to FY2040 planning horizon; this segment is south of the Study Area. The Great Western Extension is included in the FY2025 to FY 2040 planning horizon and is a new two-lane facility located north of SR 89A and will intersect SR 89 near Road 5 South. **State Route 89 Access Management Plan, June 1997** One-mile spacing of major, signalized intersections and non-major intersections with right-in, right-out, and left-in access at half-mile spacing. Driveways with direct access to SR 89 consolidated or eliminated when possible. **Chino Valley Extension Study, February 2009** New four-lane access controlled road, Chino Valley Extension, to serve as an alternate route for SR 89 in Chino Valley and Paulden areas (recommended intersection approximately 1 mile south of Big Chino Road).
Project included in TIP?	☐	☒	Not programmed
Is AADT available?	☒	☐	See next page
Is crash data available?	☒	☐	**Intersection Summary:** SR 89/Little Ranch Road. 5 crashes reported in a 5-year study period (2011 thru 2015). 2 single vehicle crashes, 1 animal crash, 1 sideswipe crash, and 1 run off the road crash. The run off the road crash resulted in a fatality. Another fatal crash occurred after the analysis period (2/25/2016).
Known Transit needs?	☐	☒	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017

Project Limits: P6-Little Ranch Road Intersection

Known Freight needs?	☒	☐	Potential increase in freight traffic once Hell Canyon Bridge is replaced.
Known Railroad needs?	☐	☒	
Known Airport needs?	☐	☒	
Known Bike needs?	☒	☐	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Known Pedestrian / ADA needs?	☐	☒	
Other needs?	☐	☒	

BMP 330.20 Road 4 North			**EMP 337.70 Big Chino Road**		
	NB AADT	**SB AADT**	**AADT**	**T Factor %**	**Future 2035 AADT**
2015	4,760	4,590	9,200	8.3	14,628
2014	4,405	4,248	8,653	10.6	N/A
2013	4,220	4,076	8,296	9.2	N/A
2012	4,102	4,055	8,157	10.5	N/A
2011	3,921	3,941	7,862	17.0	N/A

Source: *https://www.azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic*

Traffic Counts were conducted for this study March 23, 2016. Daily traffic volumes were approximately 9,200 just south of Rolling Hills Road, approximately 1/2 of a mile south of Little Ranch Road.

Study forecast projected 2036 AADT of 10,897 vpd.

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

BRIDGE DESIGN FIELD REVIEW FORM

BRIDGE NO._____

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Replace Bridge	☐	☒	☐	
Span Bridge	☐	☒	☐	
Box Culvert	☐	☒	☐	
Unique Structure	☐	☒	☐	
Replace Bridge Deck	☐	☒	☐	
Widen	☐	☒	☐	
Rail/Sidewalk Barrier	☐	☒	☐	
Corrosion Protection	☐	☒	☐	
Structural Repairs	☐	☒	☐	
Deck	☐	☒	☐	
Superstructure	☐	☒	☐	
Substructure	☐	☒	☐	
Concrete Wearing Course	☐	☒	☐	
Expansion Joints	☐	☒	☐	
Approach Panels	☐	☒	☐	
Erosion/Scour Protection	☐	☒	☐	
Painting	☐	☒	☐	
Over Water?	☐	☒	☐	
Utility accommodation	☐	☒	☐	
Need Asbestos Assessed?	☐	☒	☐	
Removals	☐	☒	☐	
Br Inventory Sheet indicates that Accelerated Bridge Construction (ABC) should be considered?	☐	☒	☐	
Other	☐	☒	☐	

Comments and Risk Identification:

Bridge No. 979, which crosses over the Big Chino Wash, is to not be impacted by this project.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

BRIDGE HYDRAULICS / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			Struc. # If any	RP	LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE			
Mainline Culverts ☐ Repair ☐ Line ☐ Replace ☒ Extend	☐	☐	☒			Existing CMP culvert crosses SR 89 just south of Little Ranch Road intersection.
Sideline Culverts ☐ Replace ☒ Extend	☐	☐	☒			Existing culvert crosses Little Ranch Road at the SR 89 intersection.
Tile	☐	☒	☐			
Storm Sewer	☐	☒	☐			
Erosion Repairs	☐	☒	☐			
Waterway analysis	☐	☐	☒			Unknown at this time.
Risk Assessment	☐	☒	☐			
Ditch Hearing	☐	☒	☐			
Special Structures	☐	☒	☐			
Weirs	☐	☒	☐			
Vortex	☐	☒	☐			
Fish Passage	☐	☒	☐			
Ponds	☐	☒	☐			
Other:	☐	☐	☐			

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

DISTRICT - CONSTRUCTION FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Detour[a]	☐	☒	☐	
Temporary Construction[a]	☐	☐	☒	Unknown at this time. Depends on rock cut limits on the west side of SR 89.
Staging[a]	☐	☐	☒	Unknown at this time.
Stockpiling	☐	☐	☒	Unknown at this time.
Innovative Contracting	☐	☒	☐	
Traffic Control	☒	☐	☐	Construction phasing will be required to accommodate daily traffic, including large trucks.
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

DISTRICT - MAINTENANCE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Striping	☒	☐	☐	
Signing	☒	☐	☐	
Lighting	☐	☒	☐	
Curb & Gutter	☐	☒	☐	
Low gravel shoulder correction	☐	☐	☒	Unknown at this time.
Guard Rail Repair	☐	☐	☒	Unknown at this time.
Fencing	☐	☐	☒	Unknown at this time.
Noisewall	☐	☒	☐	
Drainage Repair	☐	☐	☒	Unknown at this time.
Erosion Area Correction	☐	☐	☒	Unknown at this time.
Flooding Area Correction	☐	☐	☒	Unknown at this time.
Snow Trap, Storage, Icing Correction	☐	☒	☐	
RWIS	☐	☒	☐	
Anti-Icing System	☐	☒	☐	
Frost Heave Correction	☐	☒	☐	
Rest Area Work	☐	☒	☐	
Landscaping	☐	☒	☐	
Millings needed	☐	☒	☐	
Other salvage items	☐	☒	☐	
Other:	☒	☐	☐	Replace cattle guards.

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

ENVIRONMENTAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
4(f) / 6(f) sites	☐	☒	☐	No known properties within the project area.
Extensive Cultural/Historical Work	☐	☐	☒	There is one site along the west side of SR 89 at MP 335.72 located within the ROW which has undetermined eligibility.
Title VI/Environmental Justice Populations	☐	☒	☐	No permanent impacts to residents are anticipated.
Noise Concerns	☐	☒	☐	The project will not add capacity or substantially alter the alignment.
Jurisdictional Waters or Wetlands	☐	☒	☐	There are no anticipated impacts to jurisdictional waters.
Floodplain	☒	☐	☐	The project is not located within a 100-year floodplain (panel 0425C1305G).
State/Federal T&E Species	☐	☒	☐	No anticipated impacts to listed species.
Wildlife Crossing Concerns	☒	☐	☐	Wildlife crossings in project area.
Hazmat or Contaminated site	☐	☒	☐	No known sites within the project area.
Prime or Unique Farmland	☐	☒	☐	Soils within the project area are of a type which is considered Prime Farmland if irrigated. Currently no actively irrigated farming occurs adjacent to the project area.
Air Quality Nonattainment or Maintenance Area	☐	☒	☐	None within the project area.
Noxious or Invasive Species	☐	☒	☐	No known concerns in the project area.
Visual Quality Concerns	☐	☒	☐	No known concerns in the project area.
Public Involvement Required	☐	☒	☐	No public controversy is anticipated.
Significant Environmental Impacts	☐	☒	☐	
Avoidance Areas	☐	☒	☐	
Other	☒	☐	☐	The project area is within 2 miles of a bald eagle nest; therefore, seasonal construction restrictions may be applicable

Anticipated NEPA Clearance Type	Categorical Exclusion (CE) ☒	Environmental Assessment (EA) ☐	Environmental Impact Statement (EIS) ☐	N/A (No federal funds anticipated) ☐

Anticipated Permits Needed	Section 404 Permit: Nationwide Permit ☐ Individual Permit ☐	Individual Section 401 Certification ☐	Section 402 Permit: AZPDES ☐ NPDES ☐

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

GEOTECHNICAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
Will geotechnical borings be required?	☒	☐	☐	Est Drilling/Excavation Depth: Unknown at this time.
Will rock coring be required?	☐	☐	☒	Unknown at this time.
Will test pits be required?	☐	☒	☐	Est Drilling/Excavation Depth:
Is site accessible by a 4-wheel vehicle, backhoe, or trackhoe?	☒	☐	☐	
Will a seismic refraction survey be required?	☐	☐	☒	Unknown at this time.
Will geologic mapping be required?	☐	☐	☒	Unknown at this time.
Will soil/rock lab testing be required?	☐	☐	☒	Unknown at this time.
Will geotechnical investigation require a separate Environmental Clearance?	☐	☒	☐	
Other:	☒	☐	☐	Rock cut likely in the northwest corner of the intersection.

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

PAVEMENT / MATERIALS FIELD REVIEW FORM

ITEM		ITEM NEEDED			LOCATION / QUANTITY / NOTES
		YES	NO	MAYBE	
Hot Mix Asphaltic Concrete Pavement	Minor Rehab/Preventative Maint (Chip Seal, Slurry Seal, etc.)	☐	☒	☐	*(include lane width)*
	Major Rehab (Mill & Replace Only)	☐	☒	☐	
	Major Rehab (Mill, Replace & Overlay)	☐	☒	☐	
	Major Rehab (Overlay Only)	☐	☒	☐	
	Reconstruction	☒	☐	☐	*(include lane width)*
	Widening/Adding Turn Lanes	☒	☐	☐	
	Pavement Core	☒	☐	☐	
	Falling Weight Deflectometer Test	☐	☒	☐	
Portland Cement Concrete Pavement	Joint Repairs	☐	☒	☐	
	Dowel Bars	☐	☒	☐	
	Major CPR	☐	☒	☐	
	Minor CPR	☐	☒	☐	
	Widening/Turn Lanes	☐	☒	☐	
	Pavement Core	☐	☒	☐	
	Other:	☐	☒	☐	
Sub-surface	Aggregate Base Improvement	☐	☐	☒	Unknown at this time.
	Subgrade Improvement	☐	☐	☒	Unknown at this time.
	Other:	☐	☐	☐	
Shl-der	Shoulder Work	☒	☐	☐	4 foot inside and 8 foot outside.
	Other:	☐	☐	☐	
Edge Drains	Edge Drain Video Insp	☐	☒	☐	
	Edge Drain Flushing	☐	☒	☐	
	New Edge Drains	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

RIGHT-OF-WAY FIELD REVIEW FORM

Location	Existing ROW Width	Owner	Comments
Project limits	200 feet	ADOT	

List all adjacent land owners within the project limits	Private owners.

ITEM	YES	NO	MAYBE	PARCEL # / LOCATION / QUANTITY / NOTES
Potential Full-Parcel ROW Take	☐	☒	☐	
Potential Partial-Parcel ROW Take	☐	☒	☐	
Access Issues	☐	☒	☐	
Temporary Construction Easement (TCE) required	☐	☐	☒	Unknown at this time.
Drainage Easement required	☐	☒	☐	
Access Easement required	☐	☒	☐	
Plats needed	☐	☒	☐	
Other	☐	☐	☐	

Comments and Risk Identification:

Extents/width of rock cut in northwest corner of the intersection to accommodate widening is unknown.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

ROADWAY / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Design Exception	☐	☒	☐	
CSS Design Flexibility	☐	☒	☐	
Hor. Curve Correction	☐	☒	☐	
Vert. Curve Correction	☐	☒	☐	
Crown Correction	☐	☐	☒	Consider roadway crown placement to match Bridge No. 979 cross slopes should final design extend limits further north to the bridge.
Super Correction	☐	☒	☐	
Side Slope Correction	☐	☒	☐	
Shlder slope correction	☐	☒	☐	
Flatten Entrance Slopes	☐	☒	☐	
Sight-line Obstr. Correction	☐	☒	☐	
Guardrail	☐	☐	☒	Unknown at this time.
Curb & Gutter	☐	☒	☐	
Retaining Walls	☐	☒	☐	
Spillway	☐	☒	☐	
Downdrain	☐	☒	☐	
Scuppers	☐	☒	☐	
69kV lines Steel Poles	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

When considering pavement widening, a few locations that have existing utility poles could possibly need relocation due to lying within the clear zone once the road is expanded.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

TRAFFIC / SAFETY FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Bicycle Countermeasures				
Bike Lane	☐	☒	☐	
Pavement Markings / Signs	☐	☐	☒	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Shared Use Path	☐	☒	☐	
Other:	☒	☐	☐	Route is part of National bike route. Maintain shoulder for design.
Curve Countermeasures				
Enhanced Delineation and Friction for Horizontal Curve	☐	☒	☐	
Curve Warning Signs	☐	☒	☐	
Other:	☐	☐	☐	
Intersection Countermeasures				
Access Control	☐	☒	☐	
Pedestrian Phasing	☐	☒	☐	
Pedestrian Signal/ Countdown Signal	☐	☒	☐	
Offset/lengthen turn lane	☒	☐	☐	Construct new northbound left and southbound right turn lanes.
Phasing/protected left turn	☐	☒	☐	
Roundabout	☐	☒	☐	
Signal Backplates with Retroreflective Borders	☐	☒	☐	
Stop Bar	☒	☐	☐	Eastbound Little Ranch Road.
Other:	☒	☐	☐	Add southbound right-turn lane and northbound left-turn lane at Little Ranch Road.
Lane / Roadway Departure Countermeasures				
Longitudinal Rumble Strips / Stripes on 2-Lane Roads (shoulder & centerline)	☒	☐	☐	
Raised Median Barrier	☐	☒	☐	
Safety Edge	☐	☐	☒	Unknown at this time.
Shoulder	☒	☐	☐	
Other:	☐	☐	☐	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Pedestrian Countermeasures				
ADA Improvement	☐	☒	☐	
Crosswalk	☐	☒	☐	
Median and Ped Xing Island (urban / suburban area)	☐	☒	☐	
Pedestrian Hybrid Beacon	☐	☒	☐	
Pedestrian Warning Sign (Ped Xing, No Right on Red, Yield to Peds)	☐	☒	☐	
Road Diet	☐	☒	☐	
Sidewalk	☐	☒	☐	
Traffic Calming	☐	☒	☐	
Widen Shoulder	☐	☒	☐	
Other:	☐	☐	☐	
Railroad Crossing Countermeasures				
Active Advanced Warning Sign	☐	☒	☐	
Flashing Light Signals	☐	☒	☐	
Gates (Automated, Channelized, Four-Quadrant)	☐	☒	☐	
Pavement Markings	☐	☒	☐	
Signage	☐	☒	☐	
Train Detection System	☐	☒	☐	
Traffic Signal	☐	☒	☐	
Warning Bell	☐	☒	☐	
Wayside Horn System	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P6-Little Ranch Road Intersection

UTILITIES
FIELD REVIEW FORM

(1) Info Source	(2) FACILITY OWNER	(3) FACILITY TYPE	(4) LOCATION	(5) Impact	(6) ROW /TCE	(7) REMARKS/ REASON FOR CONFLICT
B&C-Bluestake	Arizona Public Services – Prescott Carby Hrober (602) 493-4225	ELECTRIC	Overhead power runs along NB SR 89 80' offset from EOP	Y		Potential conflict with proposed widening improvements.
C-Bluestake	Arizona Department of Transportation – Maricopa Tim Collins (928) 515-4035	ELECTRIC	No response	N/A		No Response
C-Bluestake	CTLQL – CenturyLink USIC DISPATCH CENTER (800) 778-9140	COAXIAL, FIBER	No response	N/A		No Response
B&C-Bluestake	Arizona Department of Transportation – Maricopa Amber Galindo-Zarate (928) 759-2426 x3615	CULVERT, STORM DRAIN	Culvert crosses SR 89 approximately 1000' south of Little Ranch Road. Culvert crosses Little Ranch Road just west of SR 89.	Y		Potential conflict with proposed widening improvements.

1) **Use A – Permit Log, B – Field Observation, C – Utility/Other**
2) **Facility Owner (company/agency) name and contact information. Note: this does not include drainage features located underground**
3) **Type and Size of facility**
4) **Use Milepost or Stationing. Last resort describe**
5) **Y – Likely to impact facility with project N – Not likely to impact facility**
6) **Y – If relocation, likely to need TCE or ROW N- No**
7) **Pertinent Information include potential relocation cost, schedule impacts, coring requirements, potential Utility Agreement notes, or other risks**

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Planning Assistance for Rural Areas
PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: March 29, 2017	**ADOT Project Manager:** Dan Gabiou
Project Name: Big Chino Road Roundabout	
City/Town: Community of Paulden	**County:** Yavapai
COG/MPO: Central Yavapai Metropolitan Planning Organization	**ADOT District:** Northwest District
Primary Route/Street: State Route 89	
Beginning Limit: MP 337.70	
End Limit: MP 337.70	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☒ County; ☒ ADOT ; ☒ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☒ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other:	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name: Yavapai County		
LPA/Tribal Contact: Byron Jaspers		
Email Address: Byron.jaspers@yavapai.us	**Phone Number:** (928) 771-3183	
Administration: ☒ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
There is a need to address safety at the intersection of SR 89 and Big Chino Road. Currently, the intersection is one lane in each direction, with dedicated left- and right-turn lanes onto Big Chino Road. Within the past five years, there have been five crashes at or near this intersection; three run off the road, one angle, and one rear end crash. Many of these appear to be a result of differing speeds for turning and through movements at Big Chino Road. There is a need to address connection (access point) density, location, and type near Big Chino Road, as well. There is a large development platted east of Big Chino Road, and commercial developments are underway. Provisions for access management for future development should be considered. Freight movement is also expected to grow, so improvements should be designed to accommodate an increase in truck traffic.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The primary purpose of the project is to provide a two-lane roundabout at Big Chino Road, which will help to mitigate crashes near the intersection and also address existing access management issues and increased traffic due to future developments east of Big Chino Road. Ultimately, the overall safety and operational efficiency of SR 89 will benefit. The proposed roundabout will be able to accommodate two WB-67 trucks side by side, as well as emergency vehicles.			

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☒ Access / Traffic Control / Detour Issues	☒ Right-of-Way
☐ Constructability / Construction Window Issues	☒ Environmental
☒ Stakeholder Issues	☒ Utilities
☒ Structures & Geotech	☒ Other: Drainage

Right-of-way: It is anticipated that most of the construction will be within the existing right-of-way; however, based on conceptual plans, additional right-of-way may be required on the southwest corner of the intersection of SR 89 and Big Chino Road. Right-of-way impacts may be mitigated or eliminated during final design. A Temporary Construction Easement (TCE) will likely be necessary on the east and west side of the roundabout footprint.

Coordination with private owner(s) and with the Yavapai County Public Works Department will be required. Traffic control will be needed during construction to protect the work zone.

Stakeholders: Project design should include coordination with Yavapai County, local developers, and impacted landowners.

Environmental: The proposed project limits fall within a known eagle nest area near Sullivan Lake. Appropriate measures should be taken to avoid impacting wildlife in the area.

Robert Wash, which is a 404 designated resource, also passes through the area, north of MP 338. This wash is protected by the Clean Water Act and will need to be considered during project development.

Utilities: There are overhead power lines that run along each side of SR 89 approximately 80 feet from the existing edge of pavement. Approximately 250 feet of overhead powerline will need to be relocated to accommodate construction and to provide an adequate clear zone. Another overhead power line crosses SR 89 approximately 750 feet north of Big Chino Road, which will need to be protected during construction. Service utilities are present in the area; utility markers are present on the northwest corner of the intersection. Utility investigation is required during final design.

Drainage: Two existing culverts cross SR 89 near Big Chino Road; Structure No. 4806 (3-10'x10'x77' RCB) located approximately 800 feet south of the intersection and a dual storm drain pipe crossing approximately 2,000 feet north of the intersection. Based upon conceptual design, these culverts would not need to be extended to accommodate improvements. Final design should consider existing culvert dimensions.

There are small floodplains between the BNSF Railway Overpass and Big Chino Road and between Pittsburgh Road and Verde Ranch Road. Final design will require further drainage investigation.

Structures: The BNSF Railway Overpass (Structure No. 1577) overpasses SR 89 approximately 1,800 feet south of Big Chino Road. This structure may impact the available length for the taper for the southern roundabout approach. Taper rate adjustments of the southern leg of the intersection or adjusting the position of the roundabout should be considered in final design to avoid impacts to the BNSF Railway Overpass.

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☒ HSIP	☒ State
	☒ Local	☐ Private	☐ Tribal	☐ Other:

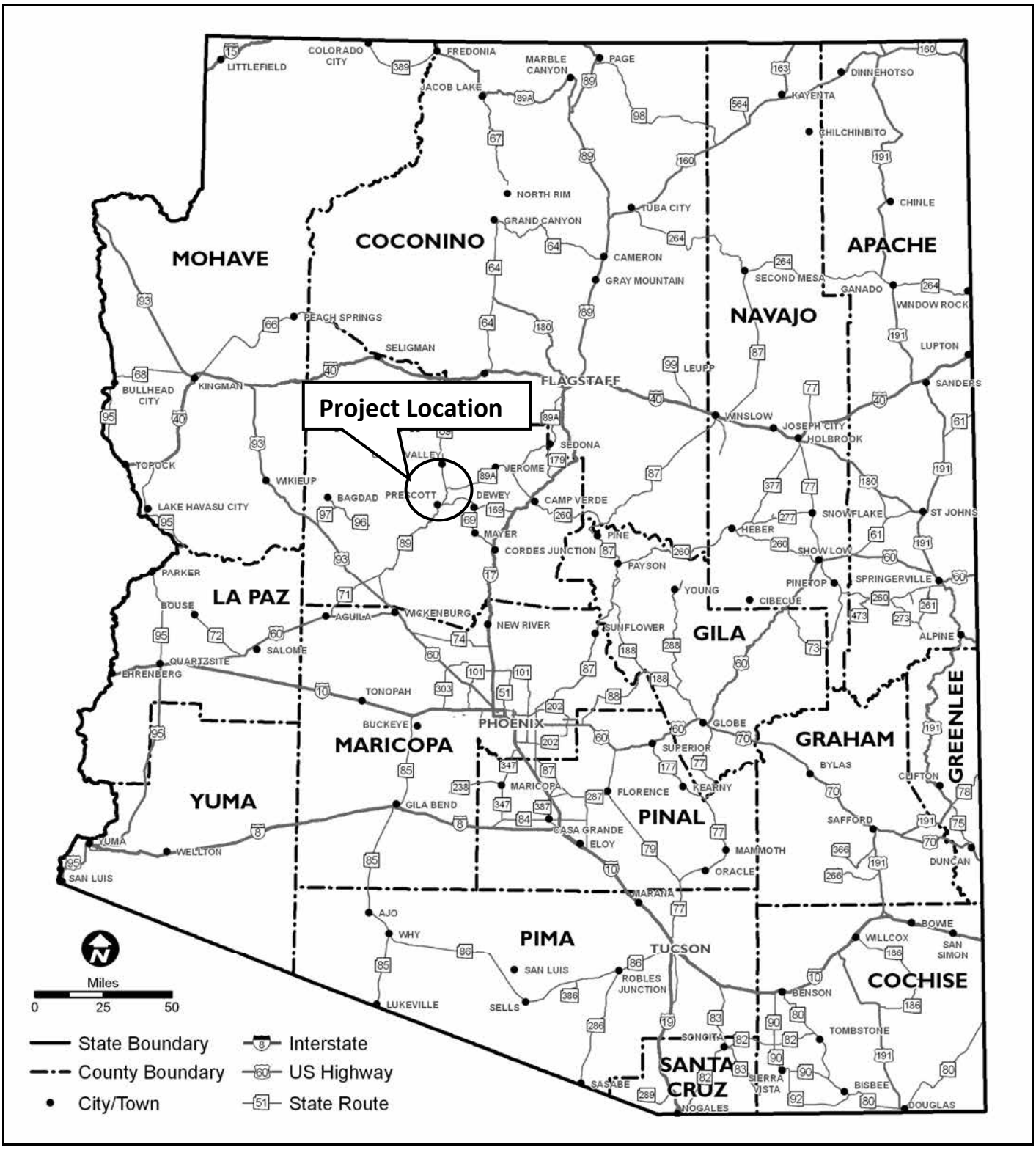
COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$91,000	$274,000	$0	$4,167,000	$4,540,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☒ Design-Bid-Build ☐ Design-Build ☐ Other
Design Program Year: FY 2021-FY 2026
Construction Program Year: FY 2022-FY 2027

ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

Project Limits: BNSF Railway to just south of Verde Ranch Road

ATTACHMENT 3 – PROJECT SCOPE OF WORK

SCOPE OF WORK

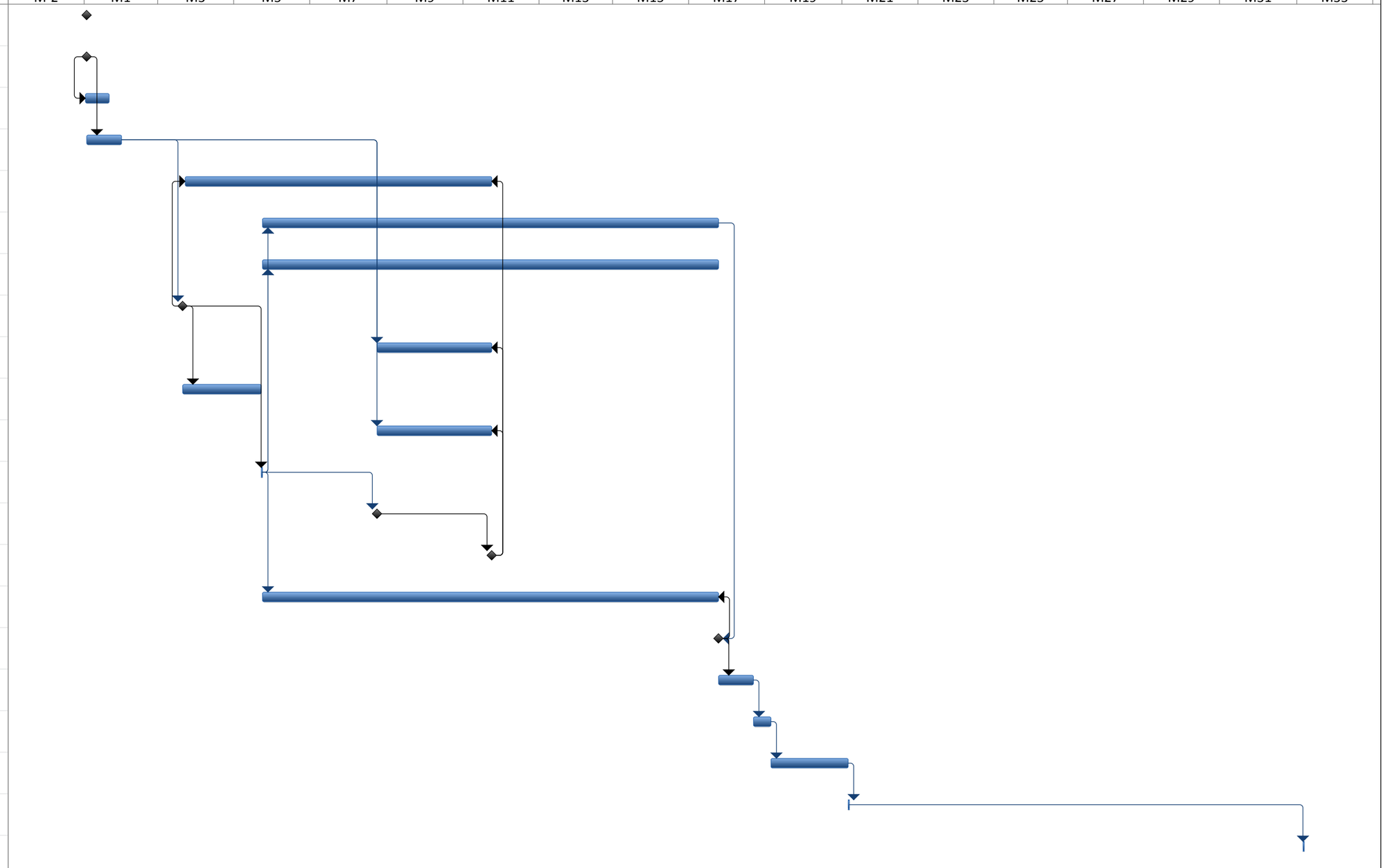
• Construct a two-lane roundabout at the intersection of SR 89 and Big Chino Road.
  • Remove 20,200 square yards of existing asphaltic concrete pavement, including saw cutting.
  • Construct 29,200 square yards of new asphaltic concrete pavement.
  • Construct 3,700 feet of concrete curb and 1,600 feet of concrete curb and gutter.
  • Provide 24,400 feet of pavement marking on new pavement.
  • Approximately 7,100 cubic yards of earthwork.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• Construct the roundabout in two phases, with a single lane roundabout as phase one.

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ATTACHMENT 4 – PROJECT SCHEDULE

ID	Task Name
1	Pre-Design/Scoping
2	Notice to Proceed (NTP)
3	Project Start-up/Kick-off
4	Mapping/Survey
5	Environmental Clearance
6	Right-of-Way Clearance
7	Utility and Railroad Clearance
8	Design Stage I
9	Geo. Test and Report
10	Value Analysis
11	Material Memo
12	Design Stage II
13	Design Stage III
14	Design Stage IV
15	Traffic Control Plans
16	Final PS & E
17	C&S Finalize Bid Package & Clearance
18	Bid Advertisement Package - Ready
19	Bid Advertisement Date
20	Bid Award Date
21	Facilities Open



Project: SR 89 Big Chino Rd Round
Date: Fri 3/31/17

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

ATTACHMENT 5 – ITEMIZED COST ESTIMATE

Big Chino Road Roundabout	MP	337.70	to MP	337.70
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	20,178	$8.00	$161,500
SAW CUTTING	L.FT.	124	$1.50	$200
EARTHWORK	L.SUM	1	$56,480.00	$56,500
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	29,198	$50.00	$1,459,900
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	24,400	$0.50	$12,200
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	3,723	$20.00	$74,500
CONCRETE CURB AND GUTTER	L.FT.	1,563	$15.00	$23,500
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	808	$60.00	$48,500
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$2,100,900**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$168,100.00	$168,100
Quality Control (1%)	COST	1.00%	$21,100.00	$21,100
Construction Surveying (1.5%)	COST	1.50%	$31,600.00	$31,600
Erosion Control (1%)	COST	1.00%	$21,100.00	$21,100
Mobilization (12%)	COST	12.00%	$252,200.00	$252,200
			PROJECTWIDE SUBTOTAL	**$494,100**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$778,500.00	$778,500
			PROJECTWIDE TOTAL	**$1,272,600**
Construction Engineering (9%)	COST	9.00%	$303,700.00	$303,700
Construction Contingencies (5%)	COST	5.00%	$168,700.00	$168,700
Engineering Design (10%)	COST	10.00%	$337,400.00	$337,400
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$809,800**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$349,800.00	$349,800

SUMMARY

ITEM TOTAL	**$2,100,900**
PROJECTWIDE TOTAL	**$1,272,600**
OTHER COST TOTAL	**$809,800**
ICAP	**$349,800**
TOTAL	**$4,540,000**

PLANNING ASSISTANCE FOR RURAL AREAS
PRELIMINARY SCOPING FIELD REVIEW REPORT

The purpose of Preliminary Scoping (Pre-Scoping) is to more accurately develop a project's Scope of Work (SOW), Schedule, and Itemized Cost Estimate prior to programming a project in a Transportation Improvement Program (TIP). This process will help to streamline project design by reducing upfront work, scope changes, project delays, and TIP Amendments.

The information gathered from the Pre-Scoping Field Review Report will be used to develop the project's SOW, Schedule, and Itemized Cost Estimate, which will be summarized in the Pre-Scoping Report.

Pre-Scoping Field Review Forms are to be completed by functional groups responsible for each area as needed (based on the project scope). Not all projects will require all Field Review Forms to be filled out.

Field Review Form	Name	Date Completed
Background Data	Benjamin Barkan	January 10, 2017
Bridge – Design		
Bridge – Hydraulics / Drainage		
District – Constructability		
District – Maintenance	Dan Gabiou	January 25, 2017
Environmental	Dan Gabiou and Justin Hoppmann	January 25, 2017
Geotechnical		
Pavement / Materials		
Right-of-Way		
Roadway / Drainage	Roger McCormick	January 25, 2017
Traffic / Safety	Dan Gabiou	January 25, 2017
Utilities		

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

23 USC 409 Disclaimer:
Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

BACKGROUND DATA
(To be completed prior to KOM and Field Review)

Previous Projects

ADOT / LPA / Tribal Project Number	Begin Milepost / Cross Street	End Milepost / Cross Street	Length (miles)	As-Built Date	Description

ITEM	YES	NO	If Yes, Describe (or see below)
Past Study Completed?	☒	☐	**CYMPO Title VI Plan, June 2016** No protected populations identified. **AASHTO U.S. Bicycle Route System, August 2015** U.S. Bicycle Route (USBR 79) recommended to go from Prescott to I-40 along SR 89. **CYMPO Regional Transportation Plan Update 2040, April 2015** Reprioritization of transportation investments through the 2040 planning horizon. RTP indicates widening to six lanes from Deep Well Ranch Road to Center Street is included in the FY2025 to FY2040 planning horizon; this segment is south of the Study Area. The Great Western Extension is included in the FY2025 to FY 2040 planning horizon and is a new two-lane facility located north of SR 89A and will intersect SR 89 near Road 5 South. **State Route 89 Access Management Plan, June 1997** One-mile spacing of major, signalized intersections and non-major intersections with right-in, right-out, and left-in access at half-mile spacing. Driveways with direct access to SR 89 consolidated or eliminated when possible. **Chino Valley Extension Study, February 2009** New four-lane access controlled road, Chino Valley Extension, to serve as an alternate route for SR 89 in Chino Valley and Paulden areas (recommended intersection approximately 1 mile south of Big Chino Road).
Project included in TIP?	☐	☒	Not programmed
Is AADT available?	☒	☐	See below
Is crash data available?	☒	☐	**Intersection Summary:** SR 89/Big Chino Road. 5 crashes reported in a 5-year study period (2011 thru 2015). 3 run off the road crashes, 1 angle crash, and 1 rear-end crashes. No fatal or serious injury.
Known Transit needs?	☐	☒	
Known Freight needs?	☒	☐	Potential increase in freight traffic once Hell Canyon Bridge is replaced.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017

Project Limits: P8-Big Chino Road Intersection

Known Railroad needs?	☒	☐	BNSF Railway Overpass (Structure No. 1577) may impact roundabout southern leg taper lengths
Known Airport needs?	☐	☒	
Known Bike needs?	☒	☐	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Known Pedestrian / ADA needs?	☐	☒	
Other needs?	☐	☒	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017

Project Limits: P8-Big Chino Road Intersection

BMP 330.20 Road 4 North			EMP 337.70 Big Chino Road		
	NB AADT	SB AADT	AADT	T Factor %	Future 2035 AADT
2015	4,760	4,590	9,200	8.3	14,628
2014	4,405	4,248	8,653	10.6	N/A
2013	4,220	4,076	8,296	9.2	N/A
2012	4,102	4,055	8,157	10.5	N/A
2011	3,921	3,941	7,862	17.0	N/A

BMP 337.70 Big Chino Road			EMP 338.80 San Francisco Street		
	NB AADT	SB AADT	AADT	T Factor %	Future 2035 AADT
2015	N/A	N/A	4,985	9.0	7,926
2014	N/A	N/A	4,690	10.6	N/A
2013	N/A	N/A	4,725	10.5	N/A
2012	N/A	N/A	5,752	12.0	N/A
2011	N/A	N/A	4,697	20.0	N/A

Source: *https://www.azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic*

Traffic Counts were conducted for this study March 23, 2016. Daily traffic volumes were approximately 9,200 just south of Rolling Hills Road, approximately 2 miles south of Big Chino Road.

Study forecast projected 2036 AADT of 10,897 vpd.

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

BRIDGE DESIGN FIELD REVIEW FORM

BRIDGE NO. 4806

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Replace Bridge	☐	☒	☐	
Span Bridge	☐	☒	☐	
Box Culvert	☐	☒	☐	
Unique Structure	☐	☒	☐	
Replace Bridge Deck	☐	☒	☐	
Widen	☐	☐	☒	Unknown at this time. It appears that widening the structure could be avoided during design.
Rail/Sidewalk Barrier	☒	☐	☐	
Corrosion Protection	☐	☒	☐	
Structural Repairs	☐	☒	☐	
Deck	☐	☒	☐	
Superstructure	☐	☒	☐	
Substructure	☐	☒	☐	
Concrete Wearing Course	☐	☒	☐	
Expansion Joints	☐	☒	☐	
Approach Panels	☐	☒	☐	
Erosion/Scour Protection	☐	☒	☐	
Painting	☐	☒	☐	
Over Water?	☐	☒	☐	
Utility accommodation	☐	☒	☐	
Need Asbestos Assessed?	☐	☒	☐	
Removals	☐	☒	☐	
Br Inventory Sheet indicates that Accelerated Bridge Construction (ABC) should be considered?	☐	☒	☐	
Other	☒	☐	☐	For roadway widening, barrier and crash attenuators will need installed on the structure over the headwalls.

Comments and Risk Identification:

Project intent is to design improvements to not impact Bridge No. 1577. Adjust roadway pavement tapers on the southern leg of the roundabout intersection, or shift the position of the roundabout, to not impact Bridge No. 1577. The northbound shoulder is approximately 6 feet to 7 feet wide; the southbound shoulder is approximately 9 feet wide under the bridge. Face-of-curb to face-of-curb is approximately 40 feet under the bridge.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

BRIDGE HYDRAULICS / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			Struc. # If any	RP	LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE			
Mainline Culverts ☐ Repair ☐ Line ☐ Replace ☒ Extend	☐	☐	☒	4806		See bridge summary above.
Sideline Culverts ☐ Replace ☐ Extend	☐	☒	☐			
Tile	☐	☒	☐			
Storm Sewer	☐	☒	☐			
Erosion Repairs	☐	☒	☐			
Waterway analysis	☐	☒	☐			
Risk Assessment	☐	☒	☐			
Ditch Hearing	☐	☒	☐			
Special Structures	☐	☒	☐			
Weirs	☐	☒	☐			
Vortex	☐	☒	☐			
Fish Passage	☐	☒	☐			
Ponds	☐	☒	☐			
Other:	☐	☒	☐			

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

DISTRICT - CONSTRUCTION FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Detour[a]	☐	☒	☐	
Temporary Construction[a]	☐	☐	☒	Unknown at this time.
Staging[a]	☐	☐	☒	Unknown at this time.
Stockpiling	☐	☐	☒	Unknown at this time.
Innovative Contracting	☐	☒	☐	
Traffic Control	☒	☐	☐	Construction phasing will be required to accommodate daily traffic, including large trucks.
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

DISTRICT - MAINTENANCE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Striping	☒	☐	☐	
Signing	☒	☐	☐	
Lighting	☐	☐	☒	Possible for roundabout.
Curb & Gutter	☒	☐	☐	Along roundabout perimeter.
Low gravel shoulder correction	☐	☐	☒	Unknown at this time.
Guard Rail Repair	☐	☐	☒	Unknown at this time.
Fencing	☐	☐	☒	Unknown at this time.
Noisewall	☐	☒	☐	
Drainage Repair	☐	☐	☒	Unknown at this time.
Erosion Area Correction	☐	☐	☒	Unknown at this time.
Flooding Area Correction	☐	☐	☒	Unknown at this time.
Snow Trap, Storage, Icing Correction	☐	☒	☐	
RWIS	☐	☒	☐	
Anti-Icing System	☐	☒	☐	
Frost Heave Correction	☐	☒	☐	
Rest Area Work	☐	☒	☐	
Landscaping	☐	☒	☐	
Millings needed	☐	☒	☐	
Other salvage items	☐	☒	☐	
Other:	☒	☐	☐	Replace cattle guards.

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

ENVIRONMENTAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
4(f) / 6(f) sites	☐	☐	☐	No known properties within the project area.
Extensive Cultural/Historical Work	☐	☒	☐	No resources in the project area.
Title VI/Environmental Justice Populations	☐	☐	☐	No permanent impacts to residents are anticipated.
Noise Concerns	☐	☒	☐	The project will not add capacity or substantially alter the alignment.
Jurisdictional Waters or Wetlands	☐	☒	☐	There are no known jurisdictional waters of the US within the project area.
Floodplain	☒	☐	☐	There is a Zone AE 100-year floodplain on the east side of SR89 (panel 0425C0990G).
State/Federal T&E Species	☐	☒	☐	No suitable habitat present.
Wildlife Crossing Concerns	☒	☐	☐	The project area is in a cooridor identified for wildlife connectivity.
Hazmat or Contaminated site	☐	☒	☐	No known spills, incedents, or concerns.
Prime or Unique Farmland	☐	☒	☐	Portions of the project area are of a soil type which is considered Prime Farmland if irrigated. Currently no actively irrigated farming occurs adjacent to the project area.
Air Quality Nonattainment or Maintenance Area	☐	☒	☐	
Noxious or Invasive Species	☐	☒	☐	No known concerns.
Visual Quality Concerns	☐	☒	☐	No known concerns.
Public Involvement Required	☒	☐	☐	Due to business/residential impacts of access management improvements.
Significant Environmental Impacts	☐	☒	☐	
Avoidance Areas	☐	☐	☐	
Other	☒	☐	☐	The project area is within 2 miles of a bald eagle nest; therefore, seasonal construction restrictions may be applicable.

Anticipated NEPA Clearance Type	Categorical Exclusion (CE) ☒	Environmental Assessment (EA) ☐	Environmental Impact Statement (EIS) ☐	N/A (No federal funds anticipated) ☐

Anticipated Permits Needed	Section 404 Permit: Nationwide Permit ☐ Individual Permit ☐	Individual Section 401 Certification ☐	Section 402 Permit: AZPDES ☒ NPDES ☐

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

GEOTECHNICAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
Will geotechnical borings be required?	☒	☐	☐	Est Drilling/Excavation Depth: Unknown at this time.
Will rock coring be required?	☐	☒	☐	
Will test pits be required?	☐	☒	☐	Est Drilling/Excavation Depth:
Is site accessible by a 4-wheel vehicle, backhoe, or trackhoe?	☒	☐	☐	
Will a seismic refraction survey be required?	☐	☐	☒	Unknown at this time.
Will geologic mapping be required?	☐	☐	☒	Unknown at this time.
Will soil/rock lab testing be required?	☐	☐	☒	Unknown at this time.
Will geotechnical investigation require a separate Environmental Clearance?	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

Existing SR 89 is on fill, above the surrounding existing ground. Widening will require earth fill.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

PAVEMENT / MATERIALS FIELD REVIEW FORM

ITEM		ITEM NEEDED			LOCATION / QUANTITY / NOTES
		YES	NO	MAYBE	
Hot Mix Asphaltic Concrete Pavement	Minor Rehab/Preventative Maint (Chip Seal, Slurry Seal, etc.)	☐	☒	☐	*(include lane width)*
	Major Rehab (Mill & Replace Only)	☐	☒	☐	
	Major Rehab (Mill, Replace & Overlay)	☐	☒	☐	
	Major Rehab (Overlay Only)	☐	☒	☐	
	Reconstruction	☒	☐	☐	*(include lane width)*
	Widening/Adding Turn Lanes	☒	☐	☐	*Roundabout*
	Pavement Core	☒	☐	☐	
	Falling Weight Deflectometer Test	☐	☒	☐	
Portland Cement Concrete Pavement	Joint Repairs	☐	☒	☐	
	Dowel Bars	☐	☒	☐	
	Major CPR	☐	☒	☐	
	Minor CPR	☐	☒	☐	
	Widening/Turn Lanes	☐	☒	☐	
	Pavement Core	☐	☒	☐	
	Other:	☐	☐	☐	
Sub-surface	Aggregate Base Improvement	☐	☐	☒	Unknown at this time.
	Subgrade Improvement	☐	☐	☒	Unknown at this time.
	Other:	☐	☐	☐	
Shl-der	Shoulder Work	☒	☐	☐	4 foot inside and 8 foot outside.
	Other:	☐	☐	☐	
Edge Drains	Edge Drain Video Insp	☐	☒	☐	
	Edge Drain Flushing	☐	☒	☐	
	New Edge Drains	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

RIGHT-OF-WAY FIELD REVIEW FORM

Location	Existing ROW Width	Owner	Comments
Project limits	200 feet	ADOT	

List all adjacent land owners within the project limits	Private owners.

ITEM	YES	NO	MAYBE	PARCEL # / LOCATION / QUANTITY / NOTES
Potential Full-Parcel ROW Take	☐	☒	☐	
Potential Partial-Parcel ROW Take	☐	☐	☒	Depending on the ultimate roundabout design, it is possible.
Access Issues	☐	☒	☐	
Temporary Construction Easement (TCE) required	☐	☐	☒	Unknown at this time.
Drainage Easement required	☐	☒	☐	
Access Easement required	☐	☐	☒	Unknown at this time.
Plats needed	☐	☒	☐	
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

ROADWAY / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Design Exception	☐	☐	☒	Depending on the ultimate roundabout design, a design exception for taper rate may be needed in order to avoid impacting the railroad overpass (Bridge No. 1577) with the southern leg of the intersection.
CSS Design Flexibility	☐	☐	☒	See design exception above.
Hor. Curve Correction	☐	☒	☐	
Vert. Curve Correction	☐	☒	☐	
Crown Correction	☐	☒	☐	
Super Correction	☐	☒	☐	
Side Slope Correction	☐	☒	☐	
Shlder slope correction	☐	☒	☐	
Flatten Entrance Slopes	☐	☒	☐	
Sight-line Obstr. Correction	☐	☒	☐	
Guardrail	☒	☐	☐	
Curb & Gutter	☒	☐	☐	Along roundabout perimeter.
Retaining Walls	☐	☐	☒	Unknown at this time. Depends on height of fill and potential impacts to adjacent lands.
Spillway	☐	☒	☐	
Downdrain	☐	☒	☐	
Scuppers	☐	☒	☐	
69kV lines Steel Poles	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

When considering pavement widening, a few locations that have existing utility poles could possibly need relocation due to lying within the clear zone once the road is expanded.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

TRAFFIC / SAFETY FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Bicycle Countermeasures				
Bike Lane	☐	☒	☐	
Pavement Markings / Signs	☐	☐	☒	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Shared Use Path	☐	☒	☐	
Other:	☒	☐	☐	Route is part of National bike route. Maintain shoulder for design.
Curve Countermeasures				
Enhanced Delineation and Friction for Horizontal Curve	☐	☒	☐	
Curve Warning Signs	☐	☒	☐	
Other:	☐	☐	☐	
Intersection Countermeasures				
Access Control	☐	☒	☐	
Pedestrian Phasing	☐	☒	☐	
Pedestrian Signal/ Countdown Signal	☐	☒	☐	
Offset/lengthen turn lane	☐	☒	☐	
Phasing/protected left turn	☐	☒	☐	
Roundabout	☒	☐	☐	Two-lane roundabout.
Signal Backplates with Retroreflective Borders	☐	☒	☐	
Stop Bar	☐	☒	☐	
Other:	☐	☐	☐	
Lane / Roadway Departure Countermeasures				
Longitudinal Rumble Strips / Stripes on 2-Lane Roads (shoulder & centerline)	☒	☐	☐	
Raised Median Barrier	☐	☒	☐	
Safety Edge	☐	☐	☒	Unknown at this time.
Shoulder	☒	☐	☐	
Other:	☐	☐	☐	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Pedestrian Countermeasures				
ADA Improvement	☐	☒	☐	
Crosswalk	☐	☒	☐	
Median and Ped Xing Island (urban / suburban area)	☐	☒	☐	
Pedestrian Hybrid Beacon	☐	☒	☐	
Pedestrian Warning Sign (Ped Xing, No Right on Red, Yield to Peds)	☐	☒	☐	
Road Diet	☐	☒	☐	
Sidewalk	☐	☒	☐	
Traffic Calming	☐	☒	☐	
Widen Shoulder	☐	☒	☐	
Other:	☐	☐	☐	
Railroad Crossing Countermeasures				
Active Advanced Warning Sign	☐	☒	☐	
Flashing Light Signals	☐	☒	☐	
Gates (Automated, Channelized, Four-Quadrant)	☐	☒	☐	
Pavement Markings	☐	☒	☐	
Signage	☐	☒	☐	
Train Detection System	☐	☒	☐	
Traffic Signal	☐	☒	☐	
Warning Bell	☐	☒	☐	
Wayside Horn System	☐	☒	☐	
Other:	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: SR 89 Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P8-Big Chino Road Intersection

UTILITIES
FIELD REVIEW FORM

(1) Info Source	(2) FACILITY OWNER	(3) FACILITY TYPE	(4) LOCATION	(5) Impact	(6) ROW /TCE	(7) REMARKS/ REASON FOR CONFLICT
B&C-Bluestake	Arizona Public Services – Prescott Carby Hrober (602) 493-4225	ELECTRIC	Overhead power runs along SB SR 89 80' offset from EOP, Overhead power runs along NB SR 89 just north of Big Chino Road 80' offset from EOP, Overhead line crosses SR 89 approximately 750' north of Big Chino Road	Y		Potential conflict with proposed widening improvements. Low Crossing. Protect during construction. Potential for pole relocation. OH utility pole relocation required on NW corner of intersection of Big Chino Road and SR 89.
B-Field Observation, C-Bluestake	CTLQL – CenturyLink USIC DISPATCH CENTER (800) 778-9140	COAXIAL, FIBER	No response. Orange utility marker spotted on NW corner of SR 89 and Big Chino Road during Field Review.	Y		Potential conflict with proposed widening improvements.
B&C-Bluestake	Arizona Department of Transportation – Maricopa TJ Soto (928) 759-2426	CULVERT, STORM DRAIN	Culvert crosses SR 89 approximately 800' south of Big Chino Road. Culvert crosses SR 89 approximately 2000' north of Big Chino Road.	Y		Potential conflict with proposed widening improvements. Culvert extension may be required.

1) **Use A – Permit Log, B – Field Observation, C – Utility/Other**
2) **Facility Owner (company/agency) name and contact information. Note: this does not include drainage features located underground**
3) **Type and Size of facility**
4) **Use Milepost or Stationing. Last resort describe**
5) **Y – Likely to impact facility with project N – Not likely to impact facility**
6) **Y – If relocation, likely to need TCE or ROW N- No**
7) **Pertinent Information include potential relocation cost, schedule impacts, coring requirements, potential Utility Agreement notes, or other risks**

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Planning Assistance for Rural Areas
PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: March 29, 2017	**ADOT Project Manager:** Dan Gabiou
Project Name: Bramble Drive Roundabout	
City/Town: Community of Paulden	**County:** Yavapai
COG/MPO: Central Yavapai Metropolitan Planning Organization	**ADOT District:** Northwest District
Primary Route/Street: State Route 89	
Beginning Limit: MP 338.81	
End Limit: MP 338.81	
Project Length: N/A	
Right-of-Way Ownership(s) (where proposed project construction would occur)**:** *(Check all that apply)* ☐ City/Town**;** ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☒ Other: Arizona State Land	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: Arizona State Land Department	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name: Yavapai County		
LPA/Tribal Contact: Byron Jaspers		
Email Address: Byron.jaspers@yavapai.us	**Phone Number:** (928) 771-3183	
Administration: ☒ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED
There is a need to address safety at the intersection of SR 89 and Bramble Drive. Within the past five years, there have been five crashes at or near this intersection; four left turn crashes and one head on crash. Many of these appear to be a result of differing speeds for turning and through movements at Bramble Drive. There is a need to address connection (access point) density, location, and type near Bramble Drive. This segment of the corridor has a large volume of freight traffic, reaching as high as 14% north of Bramble Drive. The roundabout design must accommodate heavy freight movement.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
The primary purpose of the project is to provide a two-lane roundabout at Bramble Drive, which will help to mitigate crashes near the intersection and also address access management issues within the project area. A second northbound lane is extended a distance north of the roundabout to serve as a passing lane as SR 89 climbs grade. The proposed roundabout will be able to accommodate two WB-67 trucks side by side, as well as emergency vehicles.			

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☒ Access / Traffic Control / Detour Issues	☒ Right-of-Way
☐ Constructability / Construction Window Issues	☒ Environmental
☒ Stakeholder Issues	☒ Utilities
☐ Structures & Geotech	☒ Other: Drainage

Right-of-way: It is anticipated that most of the construction will be within existing right-of-way; however, Temporary Construction Easements (TCE)s may be required on the northwest and southeast corners of the intersection between SR 89 and Bramble Drive. Coordination with the Arizona State Land Department will be necessary. Right-of-way impacts may be mitigated or eliminated during final design.

Coordination with the Yavapai County Public Works Department will be required. Traffic control will be needed during construction to protect the work zone.

Stakeholders: Additional research, analysis, coordination, and/or permitting will be required prior to construction, so as future design and construction begins, it will be necessary to coordinate with stakeholders, as well as local.

Environmental: A portion of the proposed project limits fall within a known eagle nest area near Sullivan Lake. Appropriate measures should be taken to avoid impacting wildlife in the area.

Utilities: There is a 6-inch water line that crosses SR 89 approximately 600 feet south of Bramble Drive. There is an overhead power line that crosses SR 89 approximately 300 feet north of Bramble Drive, which will need to be protected during construction. Service utilities are present in the area; utility markers were observed at the southwest and northeast corners of the intersection. Utility investigation is required during final design.

Drainage: Two existing culverts cross Bramble Drive on both the east and west legs at the intersection; a pipe culvert crosses Bramble Drive just outside the eastern edge of traveled way along SR 89, and another one crosses Bramble Drive just outside the western edge of traveled way. These small pipe culverts will need to be extended to accommodate the proposed roundabout.

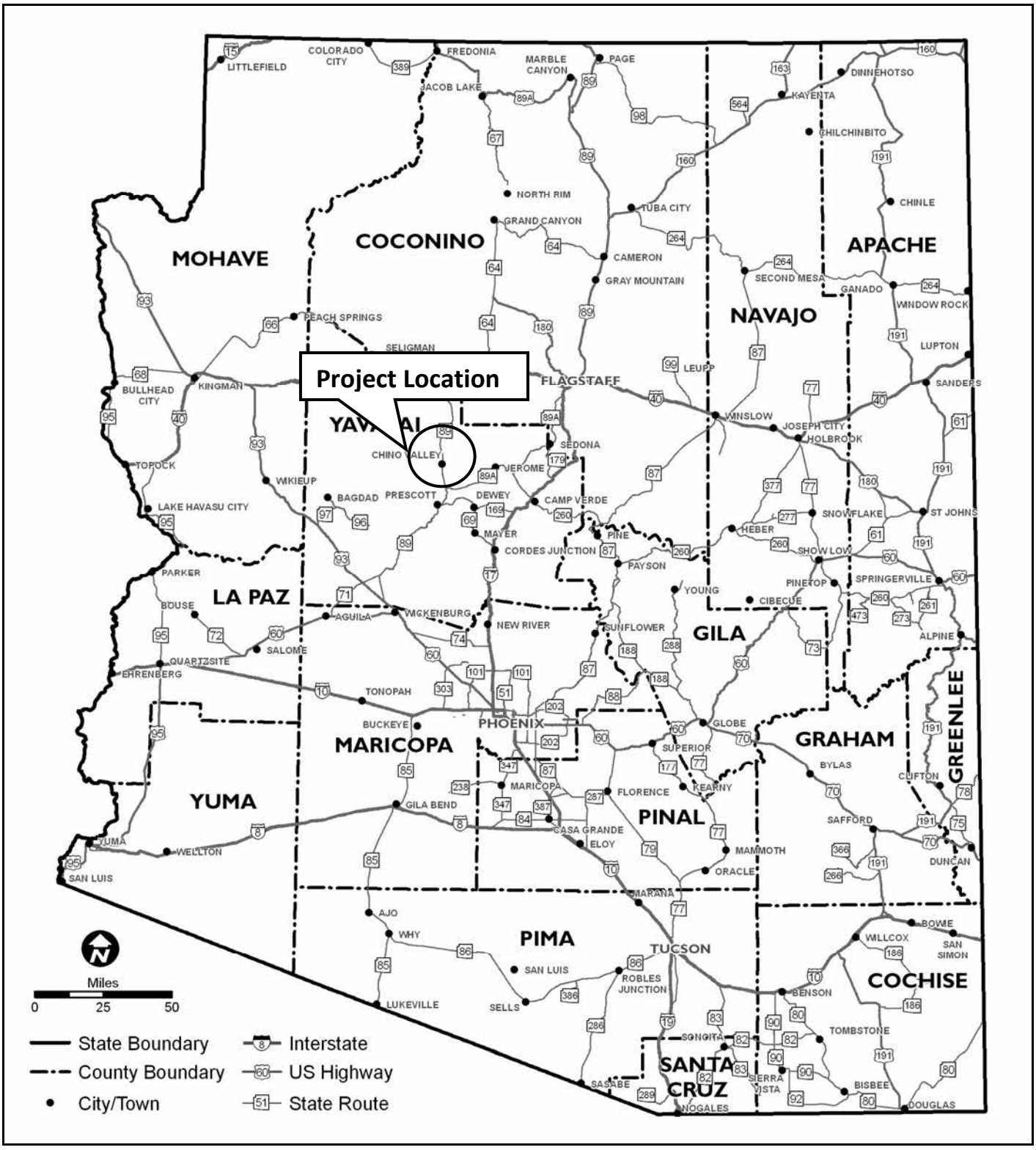
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☒ HSIP	☒ State
	☒ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
$103,000	$308,000	$0	$4,685,000	$5,100,000

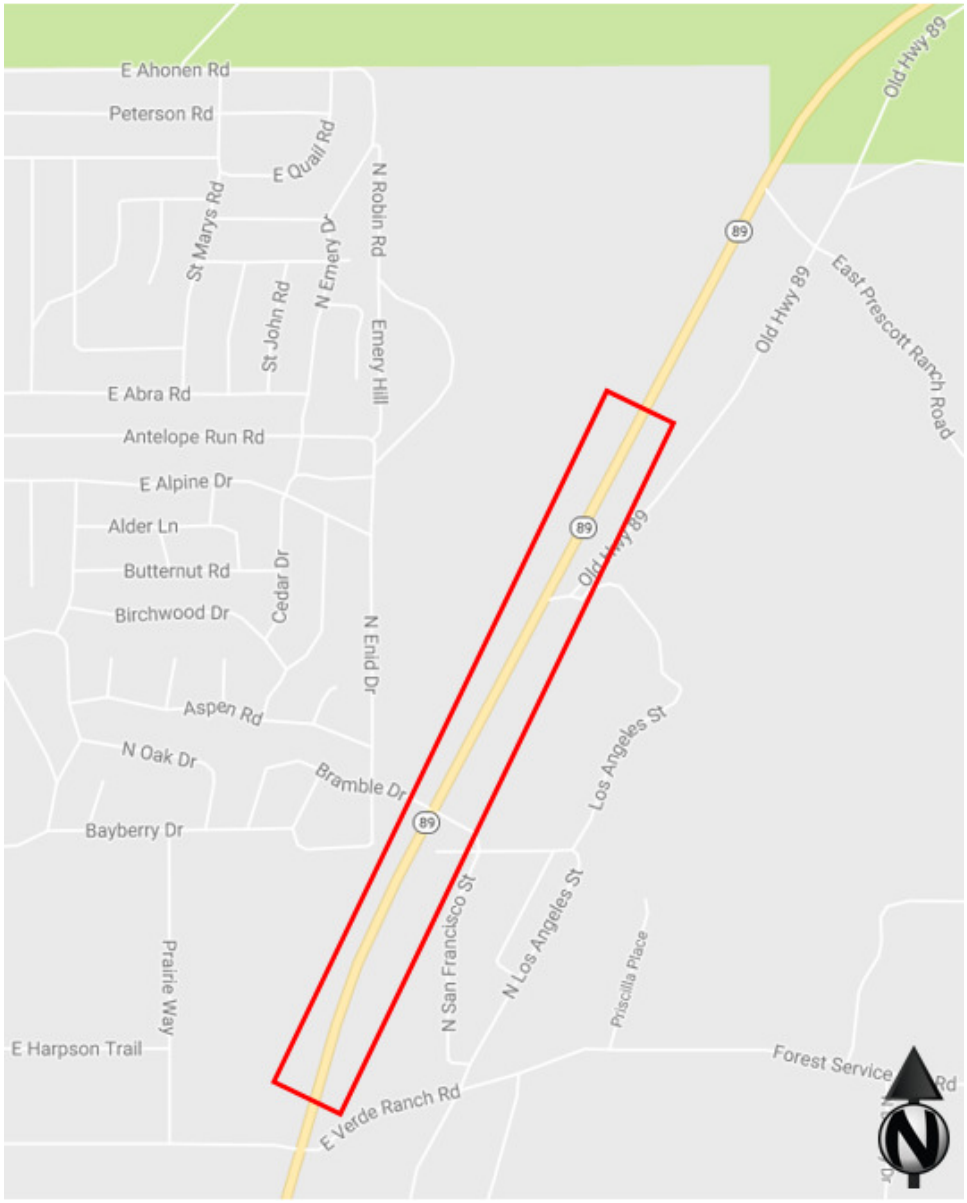
RECOMMENDED PROJECT DELIVERY
Delivery: ☒ Design-Bid-Build ☐ Design-Build ☐ Other
Design Program Year: FY 2021-2026
Construction Program Year: FY 2022-FY 2027

ATTACHMENTS
1) State Location Map 2) Project Vicinity Map 3) Project Scope of Work 4) Project Schedule 5) Itemized Cost Estimate 6) Conceptual Design Plans (not to exceed 15% design) 7) Final Field Review Report

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



Project Limits: north of Verde Ranch Road to north of intersection of SR 89 Los Angeles Street

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK

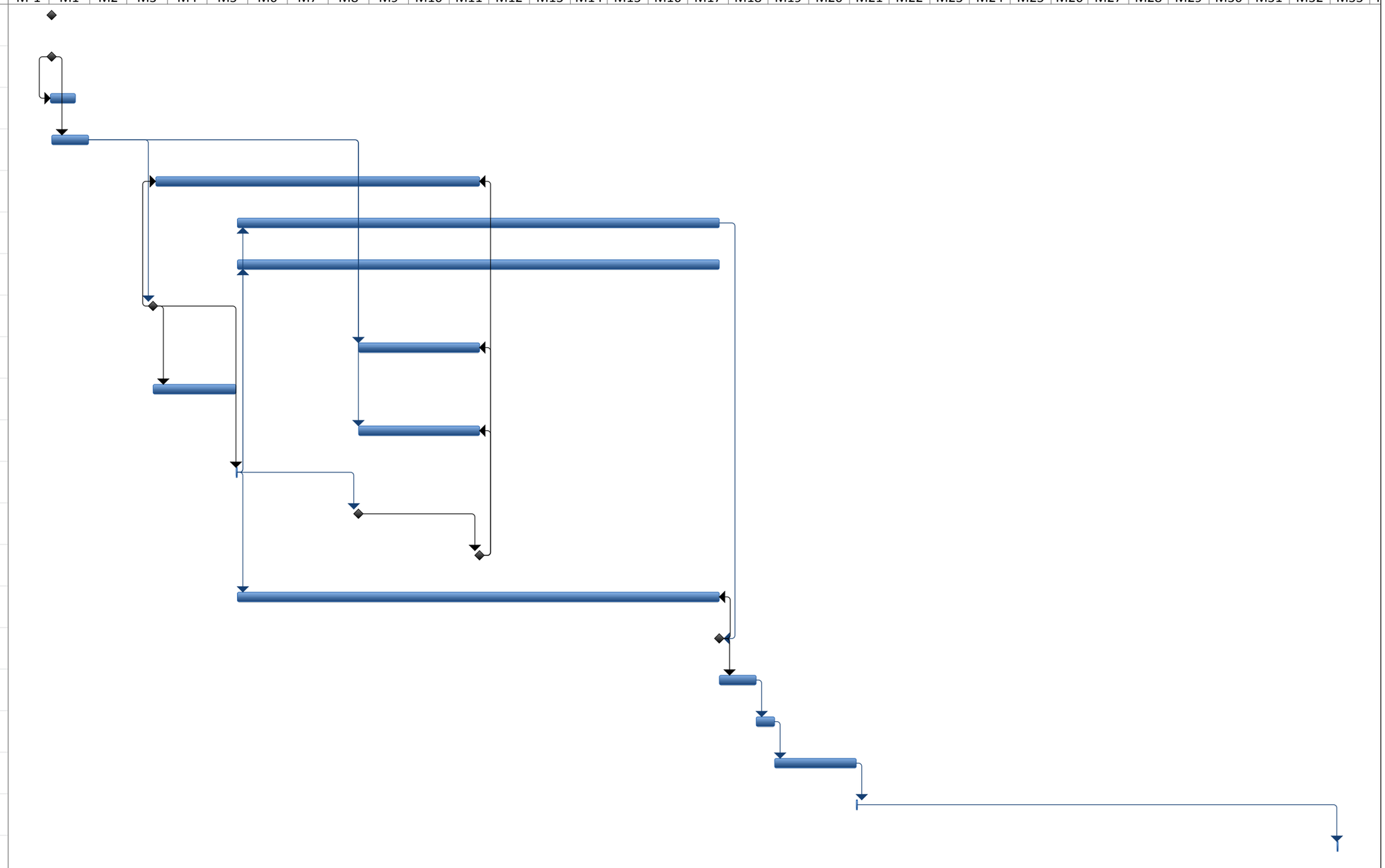
• Construct a two-lane roundabout at the intersection of SR 89 and Bramble Drive.
  • Remove 24,000 square yards of existing asphaltic concrete pavement, including saw cutting.
  • Construct 33,400 square yards of new asphaltic concrete pavement.
  • Construct 4,100 feet of concrete curb and 1,650 feet of concrete curb and gutter.
  • Provide 25,900 feet of pavement marking on new pavement.
  • Approximately 6,100 cubic yards of earthwork.

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
• Construct the roundabout in two phases, with a single lane roundabout as phase one. Not implemented due to ADOT preference and potential future costs.

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

ATTACHMENT 4 – PROJECT SCHEDULE

ID	Task Name
1	Pre-Design/Scoping
2	Notice to Proceed (NTP)
3	Project Start-up/Kick-off
4	Mapping/Survey
5	Environmental Clearance
6	Right-of-Way Clearance
7	Utility and Railroad Clearance
8	Design Stage I
9	Geo. Test and Report
10	Value Analysis
11	Material Memo
12	Design Stage II
13	Design Stage III
14	Design Stage IV
15	Traffic Control Plans
16	Final PS & E
17	C&S Finalize Bid Package & Clearance
18	Bid Advertisement Package - Ready
19	Bid Advertisement Date
20	Bid Award Date
21	Facilities Open



Project: SR 89 Bramble Dr Rounda
Date: Fri 3/31/17

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		

ATTACHMENT 5 – ITEMIZED COST ESTIMATE

Bramble Drive Roundabout	MP	338.81	to MP	338.81
Description	**Unit**	**Quantity**	**Unit Price**	**Amount**
REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	0	$5.00	$0
MILL EXISTING PAVEMENT	SQ.YD.	0	$2.00	$0
GRADING ROADWAY FOR PAVEMENT	SQ.YD.	24,000	$8.00	$192,000
SAW CUTTING	L.FT.	160	$1.50	$300
EARTHWORK	L.SUM	1	$48,960.00	$49,000
ASPHALT SURFACE COURSE	SQ.YD.	0	$6.00	$0
ASPHALTIC CONCRETE PAVEMENT SECTION	SQ.YD.	33,383	$50.00	$1,669,200
PAVEMENT MARKINGS (THERMOPLASTIC)	L.FT.	25,900	$0.50	$13,000
ROADWAY LIGHTING	L.SUM	0	$10,000.00	$0
LANDSCAPING ALLOWANCE	L.SUM	1	$15,000.00	$15,000
CONCRETE CURB	L.FT.	4,115	$20.00	$82,300
CONCRETE CURB AND GUTTER	L.FT.	1,627	$15.00	$24,400
CONCRETE SIDEWALK	SQ.FT.	0	$3.00	$0
CONCRETE SIDEWALK RAMP	EACH	0	$2,000.00	$0
CONCRETE DRIVEWAY	SQ.FT.	0	$15.00	$0
MEDIAN PAVING	SQ.YD.	1,124	$60.00	$67,500
STORM SEWER ALLOWANCE	L.SUM	1	$200,000.00	$200,000
TRUCK APRON	SQ.YD.	363	$135.00	$49,100
			ITEM TOTAL	**$2,361,800**
Maintenance and Protection of Traffic (8%)	COST	8.00%	$189,000.00	$189,000
Quality Control (1%)	COST	1.00%	$23,700.00	$23,700
Construction Surveying (1.5%)	COST	1.50%	$35,500.00	$35,500
Erosion Control (1%)	COST	1.00%	$23,700.00	$23,700
Mobilization (12%)	COST	12.00%	$283,500.00	$283,500
			PROJECTWIDE SUBTOTAL	**$555,400**
Unidentified Items (30% of Item Total and Projectwide Subtotal)	COST	30.00%	$875,200.00	$875,200
			PROJECTWIDE TOTAL	**$1,430,600**
Construction Engineering (9%)	COST	9.00%	$341,400.00	$341,400
Construction Contingencies (5%)	COST	5.00%	$189,700.00	$189,700
Engineering Design (10%)	COST	10.00%	$379,300.00	$379,300
Right-of-Way (Unknown at this time)	COST		$0.00	$0
Environmental Mitigation (Unknown at this time)	COST		$0.00	$0
			OTHER COST TOTAL	**$910,400**
Indirect Cost Allocation (ICAP) (8.36%)	COST	8.36%	$393,200.00	$393,200

SUMMARY

ITEM TOTAL	**$2,361,800**
PROJECTWIDE TOTAL	**$1,430,600**
OTHER COST TOTAL	**$910,400**
ICAP	**$393,200**
TOTAL	**$5,100,000**

PLANNING ASSISTANCE FOR RURAL AREAS
PRELIMINARY SCOPING FIELD REVIEW REPORT

The purpose of Preliminary Scoping (Pre-Scoping) is to more accurately develop a project's Scope of Work (SOW), Schedule, and Itemized Cost Estimate prior to programming a project in a Transportation Improvement Program (TIP). This process will help to streamline project design by reducing upfront work, scope changes, project delays, and TIP Amendments.

The information gathered from the Pre-Scoping Field Review Report will be used to develop the project's SOW, Schedule, and Itemized Cost Estimate, which will be summarized in the Pre-Scoping Report.

Pre-Scoping Field Review Forms are to be completed by functional groups responsible for each area as needed (based on the project scope). Not all projects will require all Field Review Forms to be filled out.

Field Review Form	Name	Date Completed
Background Data	Benjamin Barkan	January 10, 2017
Bridge – Design		
Bridge – Hydraulics / Drainage		
District – Constructability		
District – Maintenance	Dan Gabiou	January 25, 2017
Environmental	Dan Gabiou and Justin Hoppmann	January 25, 2017
Geotechnical		
Pavement / Materials		
Right-of-Way		
Roadway / Drainage	Roger McCormick	January 25, 2017
Traffic / Safety	Dan Gabiou	January 25, 2017
Utilities		

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

23 USC 409 Disclaimer:
Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

BACKGROUND DATA
(To be completed prior to KOM and Field Review)

Previous Projects

ADOT / LPA / Tribal Project Number	Begin Milepost / Cross Street	End Milepost / Cross Street	Length (miles)	As-Built Date	Description

ITEM	YES	NO	If Yes, Describe (or see below)
Past Study Completed?	☒	☐	**CYMPO Title VI Plan, June 2016** No protected populations identified. **AASHTO U.S. Bicycle Route System, August 2015** U.S. Bicycle Route (USBR 79) recommended to go from Prescott to I-40 along SR 89. **CYMPO Regional Transportation Plan Update 2040, April 2015** Reprioritization of transportation investments through the 2040 planning horizon. RTP indicates widening to six lanes from Deep Well Ranch Road to Center Street is included in the FY2025 to FY2040 planning horizon; this segment is south of the Study Area. The Great Western Extension is included in the FY2025 to FY 2040 planning horizon and is a new two-lane facility located north of SR 89A and will intersect SR 89 near Road 5 South. **State Route 89 Access Management Plan, June 1997** One-mile spacing of major, signalized intersections and non-major intersections with right-in, right-out, and left-in access at half-mile spacing. Driveways with direct access to SR 89 consolidated or eliminated when possible. **Chino Valley Extension Study, February 2009** New four-lane access controlled road, Chino Valley Extension, to serve as an alternate route for SR 89 in Chino Valley and Paulden areas (recommended intersection approximately 1 mile south of Big Chino Road).
Project included in TIP?	☐	☒	Not programmed
Is AADT available?	☒	☐	See below
Is crash data available?	☒	☐	**Intersection Summary:** SR 89/Bramble Drive. 5 crashes reported in a 5-year study period (2011 thru 2015). 4 left turn crashes and 1 head on crash. 1 crash resulted in fatal injury, and 1 resulted in an incapacitating injury.
Known Transit needs?	☐	☒	
Known Freight needs?	☒	☐	Potential increase in freight traffic once Hell Canyon Bridge is replaced.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

Known Railroad needs?	☐	☒	
Known Airport needs?	☐	☒	
Known Bike needs?	☒	☐	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Known Pedestrian / ADA needs?	☐	☒	
Other needs?	☐	☒	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

BMP 337.70 Big Chino Road		EMP 338.80 San Francisco Street	
	AADT	T Factor %	Future 2035 AADT
2015	4,985	9.0	7,926
2014	4,690	10.6	N/A
2013	4,725	10.5	N/A
2012	5,752	12.0	N/A
2011	4,697	20.0	N/A

BMP 338.80 San Francisco Street		EMP 346.52 Drake Road	
	AADT	T Factor %	Future 2035 AADT
2015	3,263	9.5	3,622
2014	3,070	12.0	N/A
2013	3,078	11.3	N/A
2012	3,405	12.8	N/A
2011	3,175	23.0	N/A

Source: *https://www.azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic*

Traffic Counts were conducted for this study March 23, 2016. Daily traffic volumes were approximately 9,200 just south of Rolling Hills Road, approximately 3.5 miles south of Bramble Drive.

Study forecast projected 2036 AADT of 10,897 vpd.

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

BRIDGE DESIGN FIELD REVIEW FORM

BRIDGE NO._____

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Replace Bridge	☐	☒	☐	
Span Bridge	☐	☒	☐	
Box Culvert	☐	☒	☐	
Unique Structure	☐	☒	☐	
Replace Bridge Deck	☐	☒	☐	
Widen	☐	☒	☐	
Rail/Sidewalk Barrier	☐	☒	☐	
Corrosion Protection	☐	☒	☐	
Structural Repairs	☐	☒	☐	
Deck	☐	☒	☐	
Superstructure	☐	☒	☐	
Substructure	☐	☒	☐	
Concrete Wearing Course	☐	☒	☐	
Expansion Joints	☐	☒	☐	
Approach Panels	☐	☒	☐	
Erosion/Scour Protection	☐	☒	☐	
Painting	☐	☒	☐	
Over Water?	☐	☒	☐	
Utility accommodation	☐	☒	☐	
Need Asbestos Assessed?	☐	☒	☐	
Removals	☐	☒	☐	
Br Inventory Sheet indicates that Accelerated Bridge Construction (ABC) should be considered?	☐	☒	☐	
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

BRIDGE HYDRAULICS / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			Struc. # If any	RP	LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE			
Mainline Culverts ☐ Repair ☐ Line ☐ Replace ☐ Extend	☐	☐	☐			
Sideline Culverts ☐ Replace ☒ Extend	☒	☐	☐			Two existing culverts cross Bramble Drive on the east and west legs of the intersection.
Tile	☐	☒	☐			
Storm Sewer	☐	☒	☐			
Erosion Repairs	☐	☒	☐			
Waterway analysis	☐	☒	☐			
Risk Assessment	☐	☒	☐			
Ditch Hearing	☐	☒	☐			
Special Structures	☐	☒	☐			
Weirs	☐	☒	☐			
Vortex	☐	☒	☐			
Fish Passage	☐	☒	☐			
Ponds	☐	☒	☐			
Other:	☐	☒	☐			

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

DISTRICT - CONSTRUCTION FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Detour[a]	☐	☒	☐	
Temporary Construction[a]	☐	☐	☒	Unknown at this time.
Staging[a]	☐	☐	☒	Unknown at this time.
Stockpiling	☐	☐	☒	Unknown at this time.
Innovative Contracting	☐	☒	☐	
Traffic Control	☒	☐	☐	Construction phasing will be required to accommodate daily traffic, including large trucks.
Other	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

DISTRICT - MAINTENANCE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Striping	☒	☐	☐	
Signing	☒	☐	☐	
Lighting	☐	☐	☒	Possible for roundabout.
Curb & Gutter	☒	☐	☐	Along roundabout perimeter.
Low gravel shoulder correction	☐	☐	☒	Unknown at this time.
Guard Rail Repair	☐	☐	☒	Unknown at this time.
Fencing	☐	☐	☒	Unknown at this time.
Noisewall	☐	☒	☐	
Drainage Repair	☐	☐	☒	Unknown at this time.
Erosion Area Correction	☐	☐	☒	Unknown at this time.
Flooding Area Correction	☐	☐	☒	Unknown at this time.
Snow Trap, Storage, Icing Correction	☐	☒	☐	
RWIS	☐	☒	☐	
Anti-Icing System	☐	☒	☐	
Frost Heave Correction	☐	☒	☐	
Rest Area Work	☐	☒	☐	
Landscaping	☐	☒	☐	
Millings needed	☐	☒	☐	
Other salvage items	☐	☒	☐	
Other:	☒	☐	☐	Replace cattle guards.

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

ENVIRONMENTAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
4(f) / 6(f) sites	☐	☒	☐	No known properties within the project area.
Extensive Cultural/Historical Work	☐	☒	☐	No resources present.
Title VI/Environmental Justice Populations	☐	☐	☐	No permanent impacts to residents are anticipated.
Noise Concerns	☐	☒	☐	The project will not add capacity or substantially alter the alignment.
Jurisdictional Waters or Wetlands	☐	☐	☐	There are no anticipated impacts to jurisdictional waters.
Floodplain	☐	☐	☐	The project is not located within a 100-year floodplain (panel 0425C0990G).
State/Federal T&E Species	☐	☐	☐	No anticipated impacts to listed species.
Wildlife Crossing Concerns	☒	☐	☐	Wildlife crossings in project area.
Hazmat or Contaminated site	☐	☒	☐	No known sites within the project area.
Prime or Unique Farmland	☐	☒	☐	Soils within the project area are of a type which is considered Prime Farmland if irrigated. Currently no actively irrigated farming occurs adjacent to the project area.
Air Quality Nonattainment or Maintenance Area	☐	☒	☐	No known concerns in the project area.
Noxious or Invasive Species	☐	☒	☐	No known concerns in the project area.
Visual Quality Concerns	☐	☒	☐	No known concerns in the project area.
Public Involvement Required	☒	☐	☐	No public controversy is anticipated.
Significant Environmental Impacts	☐	☒	☐	
Avoidance Areas	☐	☒	☐	
Other	☐	☐	☐	

Anticipated NEPA Clearance Type	Categorical Exclusion (CE) ☒	Environmental Assessment (EA) ☐	Environmental Impact Statement (EIS) ☐	N/A (No federal funds anticipated) ☐

Anticipated Permits Needed	Section 404 Permit: Nationwide Permit ☐ Individual Permit ☐	Individual Section 401 Certification ☐	Section 402 Permit: AZPDES ☒ NPDES ☐

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

GEOTECHNICAL FIELD REVIEW FORM

ITEM	YES	NO	MAYBE	LOCATION / NOTES / BUDGET-SCHEDULE IMPACTS
Will geotechnical borings be required?	☒	☐	☐	Est Drilling/Excavation Depth:
Will rock coring be required?	☐	☒	☐	
Will test pits be required?	☐	☒	☐	Est Drilling/Excavation Depth:
Is site accessible by a 4-wheel vehicle, backhoe, or trackhoe?	☒	☐	☐	
Will a seismic refraction survey be required?	☐	☐	☒	Unknown at this time.
Will geologic mapping be required?	☐	☐	☒	Unknown at this time.
Will soil/rock lab testing be required?	☐	☐	☒	Unknown at this time.
Will geotechnical investigation require a separate Environmental Clearance?	☐	☒	☐	
Other:	☐	☐	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

PAVEMENT / MATERIALS FIELD REVIEW FORM

ITEM		ITEM NEEDED			LOCATION / QUANTITY / NOTES
		YES	NO	MAYBE	
Hot Mix Asphaltic Concrete Pavement	Minor Rehab/Preventative Maint (Chip Seal, Slurry Seal, etc.)	☐	☒	☐	*(include lane width)*
	Major Rehab (Mill & Replace Only)	☐	☒	☐	
	Major Rehab (Mill, Replace & Overlay)	☐	☒	☐	
	Major Rehab (Overlay Only)	☐	☒	☐	
	Reconstruction	☒	☐	☐	*(include lane width)*
	Widening/Adding Turn Lanes	☒	☐	☐	*Roundabout. Continue second northbound departure lane from the roundabout to permit vehicles to pass slower heavier vehicles heading upgrade.*
	Pavement Core	☒	☐	☐	
	Falling Weight Deflectometer Test	☐	☒	☐	
Portland Cement Concrete Pavement	Joint Repairs	☐	☒	☐	
	Dowel Bars	☐	☒	☐	
	Major CPR	☐	☒	☐	
	Minor CPR	☐	☒	☐	
	Widening/Turn Lanes	☐	☒	☐	
	Pavement Core	☐	☒	☐	
	Other:	☐	☐	☐	
Sub-surface	Aggregate Base Improvement	☐	☐	☒	Unknown at this time.
	Subgrade Improvement	☐	☐	☒	Unknown at this time.
	Other:	☐	☐	☐	
Shl-der	Shoulder Work	☒	☐	☐	4 foot inside and 8 foot outside.
	Other:	☐	☐	☐	
Edge Drains	Edge Drain Video Insp	☐	☒	☐	
	Edge Drain Flushing	☐	☒	☐	
	New Edge Drains	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

RIGHT-OF-WAY FIELD REVIEW FORM

Location	Existing ROW Width	Owner	Comments
Project Limits	200 feet	ADOT	

List all adjacent land owners within the project limits	Private owners and Arizona State Land Department.

ITEM	YES	NO	MAYBE	PARCEL # / LOCATION / QUANTITY / NOTES
Potential Full-Parcel ROW Take	☐	☒	☐	
Potential Partial-Parcel ROW Take	☐	☐	☒	Depending on the ultimate roundabout design, it is possible.
Access Issues	☐	☒	☐	
Temporary Construction Easement (TCE) required	☐	☐	☒	Unknown at this time.
Drainage Easement required	☐	☒	☐	
Access Easement required	☐	☒	☐	Unknown at this time.
Plats needed	☐	☒	☐	
Other	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

ROADWAY / DRAINAGE FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Design Exception	☐	☒	☐	
CSS Design Flexibility	☐	☒	☐	
Hor. Curve Correction	☐	☒	☐	
Vert. Curve Correction	☐	☒	☐	
Crown Correction	☐	☒	☐	
Super Correction	☐	☒	☐	
Side Slope Correction	☐	☒	☐	
Shlder slope correction	☐	☒	☐	
Flatten Entrance Slopes	☐	☒	☐	
Sight-line Obstr. Correction	☐	☒	☐	
Guardrail	☐	☐	☒	Unknown at this time.
Curb & Gutter	☒	☐	☐	Along roundabout perimeter.
Retaining Walls	☐	☒	☐	
Spillway	☐	☒	☐	
Downdrain	☐	☒	☐	
Scuppers	☐	☒	☐	
69kV lines Steel Poles	☐	☒	☐	
Other:	☐	☒	☐	

Comments and Risk Identification:

When considering pavement widening, a few locations that have existing utility poles could possibly need relocation due to lying within the clear zone once the road is expanded.

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

TRAFFIC / SAFETY FIELD REVIEW FORM

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Bicycle Countermeasures				
Bike Lane	☐	☒	☐	
Pavement Markings / Signs	☐	☐	☒	SR 89 is identified as part of the Adventure Cycling Association Grand Canyon Connector.
Shared Use Path	☐	☒	☐	
Other:	☒	☐	☐	Route is part of National bike route. Maintain shoulder for design.
Curve Countermeasures				
Enhanced Delineation and Friction for Horizontal Curve	☐	☒	☐	
Curve Warning Signs	☐	☒	☐	
Other:	☐	☐	☐	
Intersection Countermeasures				
Access Control	☐	☒	☐	
Pedestrian Phasing	☐	☒	☐	
Pedestrian Signal/ Countdown Signal	☐	☒	☐	
Offset/lengthen turn lane	☐	☒	☐	
Phasing/protected left turn	☐	☒	☐	
Roundabout	☒	☐	☐	Two-lane roundabout.
Signal Backplates with Retroreflective Borders	☐	☒	☐	
Stop Bar	☐	☒	☐	
Other:	☐	☐	☐	
Lane / Roadway Departure Countermeasures				
Longitudinal Rumble Strips / Stripes on 2-Lane Roads (shoulder & centerline)	☒	☐	☐	
Raised Median Barrier	☐	☒	☐	
Safety Edge	☐	☐	☒	Unknown at this time.
Shoulder	☒	☐	☐	
Other:	☐	☐	☐	

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

ITEM	ITEM NEEDED			LOCATION / QUANTITY / NOTES
	YES	NO	MAYBE	
Pedestrian Countermeasures				
ADA Improvement	☐	☒	☐	
Crosswalk	☐	☒	☐	
Median and Ped Xing Island (urban / suburban area)	☐	☒	☐	
Pedestrian Hybrid Beacon	☐	☒	☐	
Pedestrian Warning Sign (Ped Xing, No Right on Red, Yield to Peds)	☐	☒	☐	
Road Diet	☐	☒	☐	
Sidewalk	☐	☒	☐	
Traffic Calming	☐	☒	☐	
Widen Shoulder	☐	☒	☐	
Other:	☐	☒	☐	
Railroad Crossing Countermeasures				
Active Advanced Warning Sign	☐	☒	☐	
Flashing Light Signals	☐	☒	☐	
Gates (Automated, Channelized, Four-Quadrant)	☐	☒	☐	
Pavement Markings	☐	☒	☐	
Signage	☐	☒	☐	
Train Detection System	☐	☒	☐	
Traffic Signal	☐	☒	☐	
Warning Bell	☐	☒	☐	
Wayside Horn System	☐	☒	☐	
Other:	☐	☒	☐	

Comments and Risk Identification:

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

Project #: MPD 0034-16 Name: Chino Valley to Forest Boundary Transportation Study Date: January 11, 2017
Project Limits: P9-Bramble Drive Intersection

UTILITIES
FIELD REVIEW FORM

(1) Info Source	(2) FACILITY OWNER	(3) FACILITY TYPE	(4) LOCATION	(5) Impact	(6) ROW /TCE	(7) REMARKS/ REASON FOR CONFLICT
B&C-Bluestake	Arizona Public Services – Prescott Carby Hrober (602) 493-4225	ELECTRIC	Overhead power crosses SR 89 just north of Bramble Drive	N		Unmarked – No locate required contractually
C-Bluestake	Abra Water Company Rod Yarbro (928) 925-1049	WATER	6" main line extension crosses SR 89 just south of Bramble Drive Existing service line (currently unused) crosses SR 89 between 6" main line and Bramble Drive	Y		Potential conflict with proposed improvements. Further utility investigation is required.
B&C-Bluestake	CTLQL – CenturyLink USIC DISPATCH CENTER (800) 778-9140	COAXIAL, FIBER	No response. Orange utility marker spotted on SW corner of SR 89 and Bramble Drive during Field Review. Orange utility marker spotted on NE corner of SR 89 and Bramble Drive during Field Review.	Y		Potential conflict with proposed widening improvements.
C-Bluestake	Arizona Department of Transportation – Maricopa Amber Galindo-Zarate (928) 759-2426 x3615	CULVERT	Culverts cross Bramble Drive on both east and west leg at intersection of SR 89.	Y		Potential conflict with proposed widening improvements. Culvert extension may be required.

1) **Use A – Permit Log, B – Field Observation, C – Utility/Other**
2) **Facility Owner (company/agency) name and contact information. Note: this does not include drainage features located underground**
3) **Type and Size of facility**
4) **Use Milepost or Stationing. Last resort describe**
5) **Y – Likely to impact facility with project N – Not likely to impact facility**
6) **Y – If relocation, likely to need TCE or ROW N- No**
7) **Pertinent Information include potential relocation cost, schedule impacts, coring requirements, potential Utility Agreement notes, or other risks**

RETURN FORM TO PROJECT MANAGER FOLLOWING THE FIELD REVIEW

State Route 89 Chino Valley to Forest Boundary Transportation Study

Field Review Meeting Summary

Date:	January 11, 2017
Time:	9:00 am
Location:	Project Site 1978 N SR 89 Chino Valley, AZ 86323

Participants:

Dan Gabiou – ADOT
Andy Roth – ADOT
Chris Bridges – CYMPO
Michael Lopez – Chino Valley, Town of
Roger McCormick – Yavapai County
Jason Pagnard – B&N
Benjamin Barkan – B&N

Handouts:

Agenda, Field Review forms for four recommended projects, relevant Working Paper 2 Plan Sheets,

Meeting began at 9:05 a.m.

Notes:

➢ **INTRODUCTIONS AND PRE-SCOPING PROCESS**

- ***Process*** – A field review, meeting documentation, and Preliminary Scoping Report (PSR) will be completed. The PSR will better define project scope, schedule, and budget as well as identify engineering and environmental constraints and overall project development process concerns.
    - *Jason Pagnard welcomed attendees and provided a general overview, including an overview of the project and process.*
    - *It was discussed that this Pre-scoping Process is intended to provide insight to facilitate the scoping and programming process. Historically, projects are programmed without much background, which has caused issues during project scoping, including over or under funding projects within programs. This pre-scoping process is intended to provide an initial review of project issues, identify potential red flags and cost drivers that will ultimately help mitigate and provide better information for the formal scoping and*

programming of projects. It is not intended to replace the formal, traditional scoping process, but provide information to help facilitate future project development efforts.

➢ PROJECT OVERVIEW

- **Widening to four-lane section with raised median from Perkinsville Road to Road 4N** – SR 89, from Perkinsville Road to Road 4N, is approximately 6,800' in length.
  - *Jason provided an overview of the project, site issues, and scope of potential improvements that originated from Working Paper 2.*
    - *Convert existing TWLTL to a raised median from Perkinsville Road to Road 3N.*
    - *Widen the road and add a median between Road 3N and Road 4N.*
    - *Improve capacity on SR 89 from Perkinsville Road to Road 4N.*
    - *Manage access points along SR 89 from Perkinsville Road to Road 4N.*
    - *Add sidewalk and ADA facilities.*
  - *It was asked whether all NB movements would be protected, and concerns were raised regarding increased U-turn movements as a result of raised medians.*
  - *Jason reminded the group that all curb ramps through the corridor will need to meet ADA requirements.*
  - *Jason asked how far along side streets, driveways, etc., to include in cost estimate.*
    - *Andy mentioned all drive aprons at driveways need to be incorporated into cost estimate.*
  - *Concern was expressed about access to and from Butterfield Road with a new raised median.*
    - *Raised median would encourage cut-through traffic at Road 3N since there is not another good nearby access point.*
    - *U-turns at Road 3N are not practical without roundabout.*
    - *It was suggest that there should be two options:*
      - *Maintain full access at Butterfield Road if no roundabout is constructed at Road 3N.*
      - *Construct raised median at Butterfield Road (convert it to RIRO) and construct roundabout at Road 3N.*
  - *It was pointed out that the potentially historic building at northwest corner of Road 3N could be constraint for the roundabout idea at Road 3N.*
  - *There is new business development anticipated along SR 89 from Road 3N to Road 3½N.*
  - *Access point should be decided sooner than later at Road 3½N. Roundabout should be considered at the location.*
  - *Everyone agreed that it made the most sense to keep SR 89 at 45 mph between Road 3N and Road 4N.*
  - *It was advised to not change vertical profile significantly, if at all. In general, SR 89 is elevated above surrounding ground.*

- **Left-turn lane at Little Ranch Road** – Intersection between SR 89 and Little Ranch Road. The proposed project is approximately 1,500' in length.
  - *Jason provided an overview of the project, site issues, and scope of potential improvements that originated from Working Paper 2.*
    - *Add left-turn lane at Little Ranch Road*
    - *Improve safety at intersection of Little Ranch Road and SR 89.*
  - *Adding a southbound right-turn lane was discussed.*
    - *Support was offered toward widening to the west and cutting into rock on the northwest corner of intersection of Little Ranch Road and SR 89 to provide room for a southbound right-turn lane.*
    - *It was stated that if the right-turn lane can be added without impacting the bridge, then it should be done.*
    - *It was suggest to widen/shift SR 89 slightly eastward to align with the bridge (Bridge No. 979) alignment just north of Little Ranch Road.*
  - *It was stated that a project goal is to reduce driver decision points at this location.*

- **Roundabout at Big Chino Road** – Intersection between SR 89 and Big Chino Road. The proposed project is approximately 4,500' in length.
  - *Jason provided an overview of the project, site issues, and scope of potential improvements that originated from Working Paper 2.*
    - *Construct roundabout at intersection of Big Chino Road and SR 89.*
    - *Improve safety at intersection of Big Chino Road and SR 89.*
  - *All agreed that BNSF Railway Bridge (Bridge No. 1577) impacts should be avoided.*
  - *There are 6-foot shoulders to face-of-curb underneath the railroad bridge on east side and 9-foot shoulders to face-of-curb on west side (approximately 40 feet from face-of-curb to face-of-curb).*
  - *It was suggested to use narrow medians leading up to roundabout at Big Chino Road.*
  - *SR 89 sits on fill substantially above grade of surrounding ground.*

- **Roundabout at Bramble Drive** – Intersection between SR 89 and Bramble Drive. The proposed project is approximately 4,000' in length.
  - *Jason provided an overview of the project, site issues, and scope of potential improvements that originated from Working Paper 2.*
    - *Construct roundabout at intersection of Bramble Drive and SR 89.*
    - *Improve safety at intersection of Big Chino Road and SR 89.*
  - *It was stated that the northbound grade climb leading to and through the Prescott National Forest just north of Bramble Drive is causing excessive passing movements due to slow moving, heavier vehicles heading northbound.*

        - *Concern was stated that if a roundabout were constructed, then this could exacerbate the issue.*
        - *It was suggested that a second northbound lane should be carried further north from the proposed roundabout to permit passing.*
    - *Cattle guards that may be compromised by recommended improvements should be replaced.*

- **FIELD REVIEW FORMS** – complete forms and return to Jason Pagnard.
    - **BRIDGE**
        - *See above. No additional bridge comments were made.*
    - **ROADWAY/PAVEMENT**
        - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
            - *Pavement exhibits significant cracking, as well as potholes in locations.*
            - *Pavement exhibits transverse cracking*
            - *Two options between Perkinsville Road and Road 3N:*
                - *Raised median with left-turn pocket at Butterfield Road combined with left-turn pocket at Road 3N*
                - *Raised median from with no left-turn pockets and a roundabout at Road 3N*
            - *Michael asked that detached sidewalks along SR 89 be considered between Road 3N and Road 4N.*
            - *Provide temporary left-turn access at Road 3½N (intermediate solution). Ultimately, construct roundabout to provide for expanding businesses in this area.*
        - *Left-turn lane at Little Ranch Road.*
            - *Consider including a southbound right-turn lane.*
        - *Roundabout at Big Chino Road.*
            - *Curb is present along southbound side of SR 89.*
    - **DRAINAGE**
        - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
            - *With proposed earthwork and grading, drainage solutions will need to be investigated and therefore, incorporated into the cost estimate.*
                - *Drainage will flow down from properties along NB SR 89.*
                - *Culverts will need to be extended to accommodate wider roadway section, including culvert just south of Commercial Way and possibly culvert just south of Industrial Drive.*
            - *A new basin may be required on SB side of SR 89 in front of Fix Bros Auto.*

        - *Substantial drainage features near recent roundabout construction at Perkinsville Road and Road 4N.*
    - *Left-Turn lane at Little Ranch Road.*
        - *Culvert under Little Ranch Road is in very poor condition.*
        - *A corrugated metal pipe crosses SR 89 just south of Little Ranch Road.*
    - *Roundabout at Big Chino Road*
        - *No existing drainage issues were identified within this project's limits.*
    - *Roundabout at Bramble Drive*
        - *No existing drainage issues within this project's limits.*

- **CONSTRUCTABILITY/MAINTENANCE**
    - *There was no discussion of constructability/maintenance issues.*

- **ENVIRONMENTAL**
    - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
        - *Potential historic property on northwest corner of intersection with Road 3N. It appears that a roundabout could potentially fit at Road 3N. There is a noticeable elevation difference between SR 89 (above) and the property and fill or wall may be required to limit impacts if a roundabout were constructed.*
        - *Old car dealership is located on east side of SR 89 from Palomino Road.*
    - *Left-turn at Little Ranch Road.*
        - *No environmental constraints discussed.*
    - *Roundabout at Big Chino Road.*
        - *No environmental constraints discussed.*
    - *Roundabout at Bramble Drive.*
        - *No environmental constraints discussed.*

- **RIGHT-OF-WAY**
    - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
        - *Town of Chino Valley owns right-of-way at Adams Drive.*
        - *Private property is in public right-of-way on northeast corner of Road 3N intersection.*
    - *Left-turn at Little Ranch Road.*
        - *There is ADOT right-of-way at Little Ranch Road intersection with SR 89.*
    - *Roundabout at Big Chino Road.*
        - *No R/W conflicts discussed at this location.*
    - *Roundabout at Bramble Drive.*
        - *Potential R/W acquisition needed on NW corner of Bramble Drive and SR 89.*

- **UTILITIES**
  - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
    - *Storm drain runs under SR 89 southbound lanes from south of Road 3N to north of Road 3N. Two manholes and storm drain outlet location to ditch northwest of end of four-lane section (north side of church), just north of Road 3N.*
    - *Gas line identified on Road 3N, just west of SR 89.*
    - *Overhead utilities will need to be relocated on southbound side of SR 89 between Road 3N and Road 4N.*
    - *Cost for agreements with the utility companies needs to be considered.*
    - *There are potential utility conflicts with power, cable, communication, gas, and water.*
    - *Utility designation is recommended.*
  - *Left-turn lane at Little Ranch Road.*
    - *There are potential utility conflicts with power and cable.*
  - *Roundabout at Big Chino Road.*
    - *Overhead utility poles are very close to northern edge of pavement of Big Chino Road west of SR 89.*
    - *Unknown underground utility runs along southbound SR 89; utility marker can be seen on northwest corner of intersection of Big Chino Road and SR 89.*
    - *Overhead power lines on northwest corner at intersection of Big Chino Road and SR 89 are very close to Big Chino Road north edge of pavement, may require relocation.*
    - *There are potential utility conflicts with power and communication.*
  - *Roundabout at Bramble Drive.*
    - *Unknown underground utility marker was spotted on southwest corner of intersection of Bramble Drive and SR 89.*
    - *A number of utilities are identified in the area, including fiber, which appears to cross SR 89 just south of Bramble Drive.*
    - *There are potential utility conflicts with power, water, and communication.*

- **TRAFFIC / SAFETY**
  - *Widening to four-lane section with raised median from Perkinsville Road to Road 4N.*
    - *Advanced loop detectors are present for northbound and southbound thru traffic.*
    - *Old sign foundations are located throughout the corridor.*
  - *Left-turn lane at Little Ranch Road.*
    - *Must reduce driver decision points within this project's limits.*
  - *Roundabout at Big Chino Road.*
    - *Must reduce driver decision points within this project's limits.*
  - *Roundabout at Bramble Drive.*
    - *Must reduce driver decision points within this project's limits.*

SITE PHOTOS FROM FIELD

REVIEW AVAILABLE CD