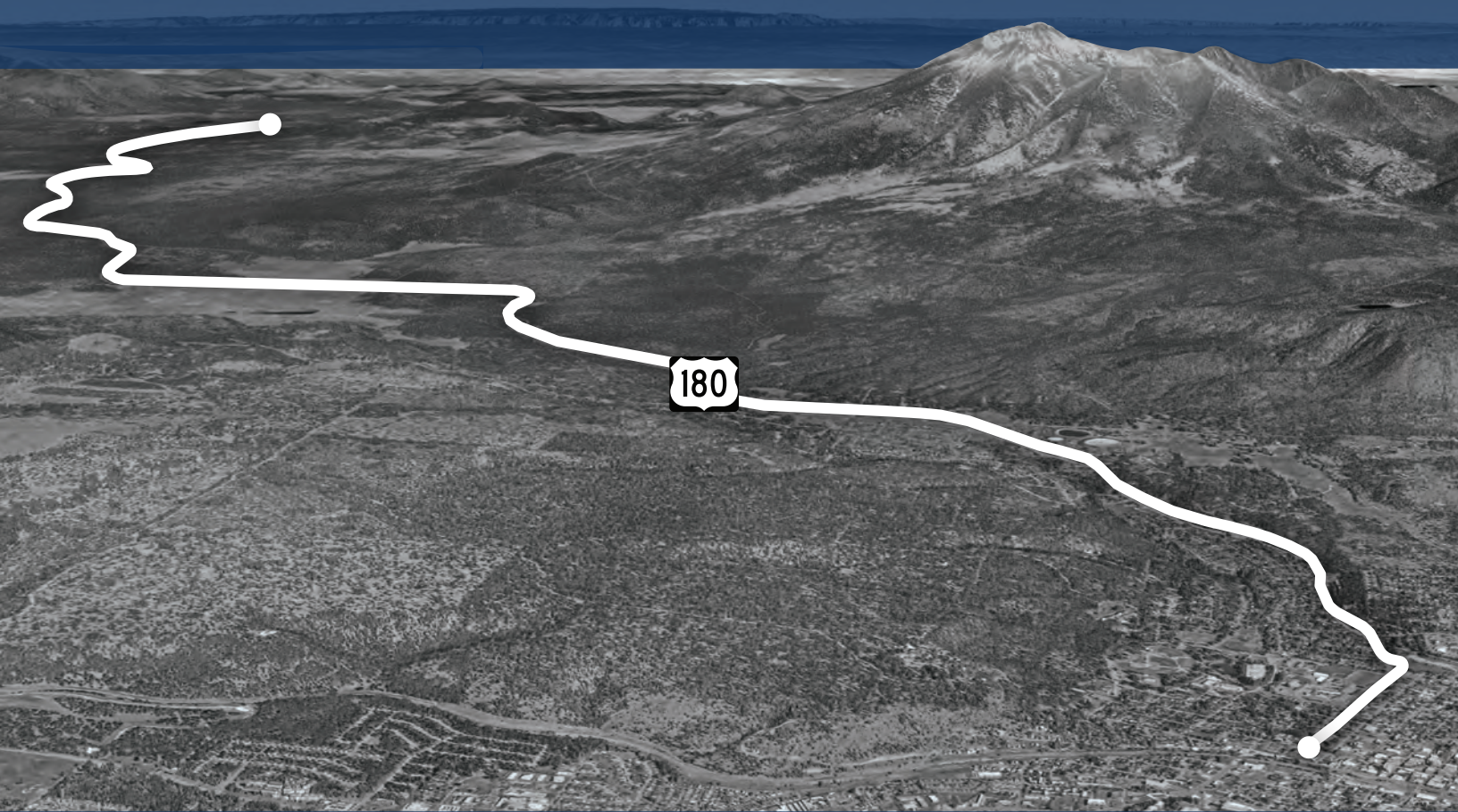


# ADOT

## US 180 Corridor Master Plan

Working Paper #1:  
Existing & Future Conditions

April 2018



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## TABLE OF CONENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>7</b>
<b>CHAPTER 1: STUDY INTRODUCTION &amp; OVERVIEW</b> .....	<b>7</b>
US 180 CORRIDOR MASTER PLAN PURPOSE & NEED .....	7
<i>Project Partner Goals &amp; Objectives</i> .....	7
US 180 CORRIDOR REVIEW .....	9
STUDY PROCESS .....	11
WORKING PAPER 1 OBJECTIVES .....	11
<b>CHAPTER 2: PREVIOUS &amp; ONGOING STUDIES, PLANS &amp; REPORTS</b> .....	<b>12</b>
FMPO BLUEPRINT 2040: REGIONAL TRANSPORTATION PLAN (FMPO, CITY OF FLAGSTAFF, NAIPTA, ADOT, COCONINO COUNTY) 2017 .....	12
US 180 WINTER TRAFFIC STUDY (FMPO) 2012 .....	15
FORT VALLEY HIGHWAY 180 SCENIC CORRIDOR AREA PLAN (COCONINO COUNTY) 2011 .....	17
LONE TREE ROAD CORRIDOR STUDY (CITY OF FLAGSTAFF/FMPO) 2006 .....	18
FLAGSTAFF HIGH OCCUPANCY HOUSING DRAFT SPECIFIC PLAN (CITY OF FLAGSTAFF) JULY 2017 .....	20
BEULAH-UNIVERSITY ALIGNMENT STUDY (CITY OF FLAGSTAFF) 2015 .....	24
FIVE-YEAR TRANSIT PLAN (NAIPTA) 2017 .....	24
NAIPTA TRANSIT SPINE LOCALLY PREFERRED ALTERNATIVE FINAL REPORT (JUNE 2016) .....	24
FLAGSTAFF REGIONAL FIVE YEAR & LONG RANGE TRANSIT PLAN (NAIPTA/ADOT) 2013 .....	25
CITY OF FLAGSTAFF DRAFT ACTIVE TRANSPORTATION MASTER PLAN (CITY OF FLAGSTAFF AND FMPO) 2015 .....	26
<b>CHAPTER 3: PUBLIC &amp; STAKEHOLDER ENGAGEMENT</b> .....	<b>27</b>
PUBLIC ENGAGEMENT GOALS & OBJECTIVES .....	27
PROJECT PARTNERS .....	27
PROJECT STAKEHOLDERS .....	28
PROJECT PARTNER CHARTER .....	28
ISSUE ESCALATION LADDER .....	30
PUBLIC INVOLVEMENT PLAN .....	30
PUBLIC OUTREACH METHODS .....	30
<b>CHAPTER 4: EXISTING LAND USE, DEMOGRAPHIC &amp; SOCIO-ECONOMIC CONDITIONS</b> .....	<b>32</b>
LAND OWNERSHIP .....	32
EXISTING LAND USE & ACTIVITY CENTERS .....	32
EXISTING ZONING .....	33
DEMOGRAPHIC & SOCIOECONOMIC CONDITIONS .....	33
<i>City of Flagstaff &amp; Regional General Demographic &amp; Socioeconomic Information</i> .....	33
<i>Demographic &amp; Socioeconomic Data Adjacent to the US 180 Corridor</i> .....	34
<b>CHAPTER 5: EXISTING ROADWAY &amp; CORRIDOR CONDITIONS</b> .....	<b>41</b>
FUNCTIONAL CLASSIFICATION .....	41
ROADWAY AND LANE CONFIGURATION .....	41
POSTED SPEED LIMITS, TRAFFIC CONTROL AND LIGHTING CONDITIONS .....	42
<i>Posted Speed Limit</i> .....	42
<i>Traffic Control</i> .....	42
<i>Lighting Conditions</i> .....	42
EXISTING TRAVEL CONDITIONS, LOS & CONGESTION .....	48



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

<i>Historical Traffic Volumes</i> .....	48
<i>Existing Traffic Volumes</i> .....	48
<i>Existing Roadway Level-of-Service</i> .....	48
<i>Bicycle &amp; Pedestrian Counts</i> .....	48
EXISTING INTERSECTION OPERATIONAL ANALYSIS .....	49
<i>Existing Turning Movement Volumes</i> .....	49
<i>Existing Intersection Level-of-Service (LOS)</i> .....	51
EXISTING NON-MOTORIZED MOBILITY .....	57
<i>Existing Bike Facilities</i> .....	57
<i>Existing Pedestrian Facilities</i> .....	57
<i>Existing Transit Services</i> .....	57
ACCESS MANAGEMENT GUIDELINES .....	58
ADOT.....	58
City of Flagstaff.....	58
Current Access.....	59
EXISTING PAVEMENT CONDITIONS.....	62
<b>CHAPTER 6: EXISTING CORRIDOR SAFETY CONSIDERATIONS .....</b>	<b>63</b>
VEHICULAR CRASH DATA ANALYSIS (5 YEARS).....	63
<i>Injury Severity</i> .....	63
<i>Intersection Relation</i> .....	65
<i>Collision Manner</i> .....	66
<i>Crashes by Year</i> .....	67
<i>Crashes by the Time of the Year</i> .....	67
<i>Crashes by the Day of the Week</i> .....	68
<i>Lighting Conditions</i> .....	68
<i>Crashes by Cause (change pie chart to numbers from %)</i> .....	69
<i>Pedestrian/Bicycle Crash Data Analysis</i> .....	70
<i>Mid-Block Crossings</i> .....	70
<b>CHAPTER 7: FUTURE TRAFFIC CONDITIONS.....</b>	<b>72</b>
PROJECTED TRAFFIC CONDITIONS & CONGESTION .....	72
<i>Roadway Network</i> .....	72
<i>Design Year 2040 Traffic Volumes</i> .....	72
<i>Future Intersection Operational Analysis</i> .....	75
<i>Design Year 2040 LOS</i> .....	78
<i>Short-Term Projected Traffic Conditions and Needs</i> .....	79
<b>CHAPTER 8: US 180 CORRIDOR MASTER PLAN ENVIRONMENTAL OVERVIEW.....</b>	<b>80</b>
GENERAL INFORMATION .....	80
THREATENED, ENDANGERED & SENSITIVE SPECIES.....	81
WILDLIFE MOVEMENT .....	83
INVASIVE, NOXIOUS WEEDS & PROTECTED ARIZONA NATIVE PLANTS .....	86
WATER QUALITY, WATER RESOURCES & FLOODPLAINS .....	86
NOISE .....	89
VISUAL RESOURCES .....	89
AIR QUALITY .....	91
HAZARDOUS MATERIALS .....	91
CULTURAL RESOURCES .....	94



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

<b>CHAPTER 9: CONSIDERATION OF EXISTING AND NEWLY DEVELOPED ALTERNATIVES .....</b>	<b>101</b>
IDENTIFYING EXISTING ALTERNATIVES TO DATE .....	101
CREATION OF ADDITIONAL ALTERNATIVES FOR CONSIDERATION .....	102
EVOLUTION OF THE UNIVERSE OF ALTERNATIVES TO SYSTEM ALTERNATIVES AND BASE BUILD SPOT IMPROVEMENTS .....	102
PRELIMINARY SYSTEM ALTERNATIVES .....	103
<i>Preliminary System Alternatives Utilizing Existing Right of Way .....</i>	<i>104</i>
<i>Preliminary System Alternatives Requiring Expanded Right-of-Way .....</i>	<i>107</i>
<i>Alternate Routes to US 180.....</i>	<i>110</i>
REFERENCES CITED .....	124



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## LIST OF FIGURES

FIGURE 1-1: US 180 CMP STUDY CORRIDOR .....	10
FIGURE 1-2: STUDY PROCESS.....	11
FIGURE 2-1: ROADS & STREETS BUILD OUT PLAN.....	13
FIGURE 2-2: 20-YEAR PROGRAM SUMMARY .....	14
FIGURE 2-3: LONE TREE CORRIDOR STUDY PREFERRED ALTERNATIVE .....	19
FIGURE 2-4: MODAL SHARE OF ALL TRIPS BY AREA OF RESIDENCE (2012).....	21
FIGURE 2-5: POTENTIAL HOH DEVELOPMENT ZONES .....	22
FIGURE 2-6: PROPOSED FUTURE GROWTH ILLUSTRATION .....	23
ON AUGUST 2, 2017, A PROJECT PARTNER CHARTER WAS DEVELOPED AS A FORMAL EXPRESSION OF THE PARTNERSHIP VALUES, MISSION AND GOALS THAT THE PROJECT PARTNERS ARE COMMITTED TO FOR THE DURATION OF THIS PROJECT (FIGURE 3-1). THE CHARTER WILL CONTINUALLY SERVE AS A GUIDE TO ADOT AND IT’S PROJECT PARTNERS TO DEVELOP, MAINTAIN AND ENHANCE THE PARTNERSHIP FOR THE US 180 CMP PROCESS. THE CHARTER HELPS CREATE AND MAINTAIN IS A PLAN FOR PROJECT SUCCESS BY; .28	
FIGURE 3-1: PROJECT PARTNER CHARTER .....	29
FIGURE 3-3: ISSUE ESCALATION LADDER .....	30
FIGURE 4-1: FLAGSTAFF AND COCONINO COUNTY ETHNICITY.....	33
FIGURE 4-2: CITY OF FLAGSTAFF POPULATION AGE.....	34
FIGURE 4-3: US 180 CORRIDOR LAND OWNERSHIP.....	35
FIGURE 4-4: US 180 CORRIDOR EXISTING ZONING.....	36
FIGURE 4-5: US 180 CORRIDOR ADJACENT CENSUS TRACTS .....	37
FIGURE 4-6: US 180 CORRIDOR PERCENT OF POPULATION LIVING BELOW POVERTY .....	38
FIGURE 4-7: US 180 PERCENT OF POPULATION 65 YEARS OF AGE AND OLDER .....	39
FIGURE 4-8: US 180 PERCENT DISABLED POPULATION .....	40
FIGURE 5-1: FHWA FUNCTIONAL CLASSIFICATION OF ROADWAYS .....	43
FIGURE 5-2: FHWA FUNCTIONAL CLASSIFICATION OF ROADWAYS (CONTINUED) .....	44
FIGURE 5-3: EXISTING 2017 INTERSECTION CONTROL AND LANE GEOMETRY .....	45
FIGURE 5-4: EXISTING TRAFFIC CONTROL AT STUDY INTERSECTIONS.....	46
FIGURE 5-5: EXISTING TRAFFIC CONTROL AT STUDY INTERSECTIONS (CONTINUED) .....	47
FIGURE 5-6: EXISTING 2017 PEAK HOUR TRAFFIC VOLUMES – (MD) PM PEAK HOURS.....	50
FIGURE 5-7: EXISTING 2017 LANE GEOMETRY .....	54
FIGURE 5-8: EXISTING 2017 LANE GEOMETRY (CONTINUED) .....	55
FIGURE 5-9: EXISTING ACCESS POINTS .....	60
FIGURE 5-10: EXISTING ACCESS POINTS (CONTINUED) .....	61
FIGURE 6-1: US 180 CRASHES BY INJURY SEVERITY .....	64
FIGURE 6-2: PERCENTAGE OF CRASHES BY INJURY SEVERITY .....	65
FIGURE 6-3: CRASH PERCENTAGES BASED ON INTERSECTION RELATION .....	65
FIGURE 6-4: PERCENTAGE OF CRASHES BY COLLISION TYPE .....	67
FIGURE 6-5: TOTAL CRASHES BY YEAR.....	67
FIGURE 6-6: TOTAL CRASHES BY MONTH.....	68
FIGURE 6-7: CRASHES BY THE DAY OF WEEK.....	68
FIGURE 6-8: CRASH PERCENTAGES BY LIGHTING CONDITIONS .....	68
FIGURE 6-9: CRASHES BY CAUSE .....	69
FIGURE 6-10: PEDESTRIAN CRASH SUMMARY.....	70
FIGURE 7-1: 2040 PEAK HOUR TRAFFIC VOLUMES INCLUDING SNOW TRAFFIC VOLUMES.....	76
FIGURE 7-2: 2040 INTERSECTION CONTROL AND LANE GEOMETRY .....	77
FIGURE 8-1: WILDLIFE LINKAGE ZONES.....	85
FIGURE 8-2: ARIZONA WATERSHEDS.....	87
FIGURE 8-3: FLOOD HAZARD .....	88



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

FIGURE 8-4: CITY OF FLAGSTAFF LIGHTING ZONE MAP .....	90
FIGURE 8-5: UNDERGROUND STORAGE TANKS.....	93
FIGURE 9-1: US 180 SYSTEM ALTERNATIVE 2 CROSS-SECTION* .....	106
FIGURE 9-2: US 180 SYSTEM ALTERNATIVE 2 PLAN VIEW* .....	106
FIGURE 9-3: US 180 SYSTEM ALTERNATIVE 3 CROSS-SECTION .....	107
FIGURE 9-4: US 180 SYSTEM ALTERNATIVE 4 CROSS-SECTION* .....	108
FIGURE 9-5: US 180 SYSTEM ALTERNATIVE 5 CROSS-SECTION* .....	109
FIGURE 9-6: US 180 SYSTEM ALTERNATIVE 6 CROSS SECTION .....	110
FIGURE 9-7: US 180 ALTERNATIVE ROUTES.....	112
FIGURE 9-8: US 180 SYSTEM ALTERNATIVE 7 .....	113
FIGURE 9-9: US 180 SYSTEM ALTERNATIVE 8 .....	114
FIGURE 9-10: US 180 SYSTEM ALTERNATIVE 9 .....	115
FIGURE 9-11: US 180 SYSTEM ALTERNATIVE 11 .....	116
FIGURE 9-12: US 180 SYSTEM ALTERNATIVE 12 .....	117
FIGURE 9-13: US 180 SYSTEM ALTERNATIVE 13 .....	118
FIGURE 9-14: US 180 SYSTEM ALTERNATIVE 14 .....	119
FIGURE 9-15: US 180 SYSTEM ALTERNATIVE 15 .....	120
FIGURE 9-16: US 180 SYSTEM ALTERNATIVE 16 .....	121
FIGURE 9-17: US 180 SYSTEM ALTERNATIVE 17 .....	122
FIGURE 9-18: SYSTEM ALTERNATIVE 18 .....	123



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## LIST OF TABLES

TABLE 2-1: US 180 PEAK WINTER WEEKEND TRAFFIC STRATEGY IMPLEMENTATION PLAN .....	16
TABLE 5-1: EXISTING PEDESTRIAN CROSSING VOLUME .....	48
TABLE 5-2: EXISTING BICYCLE CROSSING VOLUME .....	48
TABLE 5-3: LEVEL OF SERVICE CRITERIA FOR URBAN STREET FACILITIES.....	52
TABLE 5-4: LEVEL-OF-SERVICE CRITERIA AT SIGNALIZED AND UNSIGNALIZED INTERSECTIONS .....	53
TABLE 5-5: EXISTING 2017 LOS AT SIGNALIZED AND UNSIGNALIZED INTERSECTIONS .....	56
TABLE 5-6: MINIMUM SPACING OF DRIVEWAYS TO INTERSECTIONS PER CITY OF FLAGSTAFF .....	59
TABLE 6-1: CRASH SEVERITY COMPARISON .....	63
TABLE 6-2: SUMMARY OF INTERSECTION CRASHES.....	66
TABLE 7-1: GROWTH RATE CALCULATIONS .....	72
TABLE 7-2: SEASONAL TRAFFIC VOLUMES AND ADJUSTMENT FACTORS.....	73
TABLE 7-3: PEAK DIRECTIONAL HOURLY VOLUMES .....	73
TABLE 7-4: SNOW TRAFFIC WITH 0.5% GROWTH FACTOR .....	74
TABLE 7-5: 2040 PEAK HOUR LOS AT SIGNALIZED AND UNSIGNALIZED INTERSECTIONS .....	78
TABLE 8-1: FEDERALLY LISTED SPECIES .....	81
TABLE 8-2: MIGRATORY BIRDS POTENTIALLY IMPACTED BY THE PROJECT LOCATION .....	82
TABLE 8-3: UNDERGROUND STORAGE TANKS .....	92
TABLE 8-4:SUMMARY OF PREVIOUSLY RECORDED CULTURAL RESOURCES .....	96
TABLE 8-5: HISTORICAL BUILDINGS (CONSTRUCTED PRIOR TO 1968) .....	97
TABLE 9-1: US 180 WINTER TRAFFIC STUDY STRATEGIES .....	101
TABLE 9-2: US 180 CMP UNIVERSE OF EXISTING ALTERNATIVES.....	102
TABLE 9-3: US 180 PRELIMINARY SYSTEM ALTERNATIVES .....	103



## EXECUTIVE SUMMARY

Submitted in future as part of Work Task 8: Draft Final Report.

## CHAPTER 1: STUDY INTRODUCTION & OVERVIEW

### US 180 Corridor Master Plan Purpose & Need

The purpose of the US 180 Corridor Master Plan (CMP) is to identify a 20-year vision for the US 180 corridor that addresses current safety and traffic congestion issues by evaluating a mixture of previously recommended and newly introduced System Alternatives. These System Alternatives include a mix of alternatives that utilize and maintain the existing US 180 right-of-way, alternatives that would require an expanded right-of-way, and alternative routes separate and in addition to the US 180 corridor itself.

The System Alternatives are also complemented by a series of Base Build Spot Improvements – which constitute targeted, near term low investment mitigation measures that support mid and long-term System Alternatives. Chapter 9 of this report describes the System Alternatives and Base Build Spot Improvements in greater detail.

The US 180 CMP process will include an extensive public and stakeholder involvement process that consists a thorough and community-vetted, quantitative evaluation criteria exercise for the evaluation of the System Alternatives to ultimately reach a set of preferred System Alternative(s) and achieve an informed consensus by the Project Partners, stakeholders and citizens.

### Project Partner Goals & Objectives

As part of the CMP Process, a team of Project Partners (Partners) was assembled by representatives from the following agencies:

- Arizona Department of Transportation (ADOT)
- Flagstaff Metropolitan Planning Organization (FMPO)
- Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA)
- City of Flagstaff
- Coconino County
- US Forest Service (USFS)
- Federal Highways Administration (FHWA)
- Northern Arizona University (NAU)
- Burlington Northern Santa Fe Railroad (BNSF)

The Project Partners are established to guide the success of the US 180 CMP planning process by maintaining a positive and supportive working relationship with all partnering agencies, hold regular communication, and stay committed to the project's core values. The Project Partners met early in the planning process to agree upon and create a Charter ([Appendix X](#)) to establish a set of fundamental principles for the Partners to abide by. The Project Partners also established the following seven goals for the US 180 CMP which are not prioritized in any particular order:





# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

- 1** Address congestion (with a special emphasis on winter congestions) and safety on US 180
- 2** Identify the long-term (20-year) vision of the corridor
- 3** Obtain public and stakeholder input on alternatives, including multimodal alternatives
- 4** Scope out and further implement previous and new strategies, consistent with the long-term vision
- 5** Prioritize implementation projects for design
- 6** Assist NAIPTA in completing its Bus Rapid/Transit/High Capacity Transit system design
- 7** Follow the Planning and Environmental Linkages (PEL) process to carry forward decisions into the design and NEPA



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## US 180 Corridor Review

US Highway 180 (US 180) is primarily an east-west running highway that travels through Texas, New Mexico and Arizona. Arizona’s portion is about 170 disconnected miles as it has been re-routed over the last several decades. In Arizona, US 180 goes through lightly populated areas between St. Johns and Holbrook, and then shares alignment with Interstate 40 (I-40) for approximately 85 miles to the City of Flagstaff. From Flagstaff, US 180 traverses northwest to its western terminus in Valle, Arizona. Illustrated in **Figure 1-1**, the US 180 Corridor Master Plan will look at the 17.4-mile section of the highway northwest of the City of Flagstaff from the intersection of Historic Route 66 and Humphreys Street (Mile Post 215.44) to the Crowley Pit Snow Play Area (Mile Post 232.25).

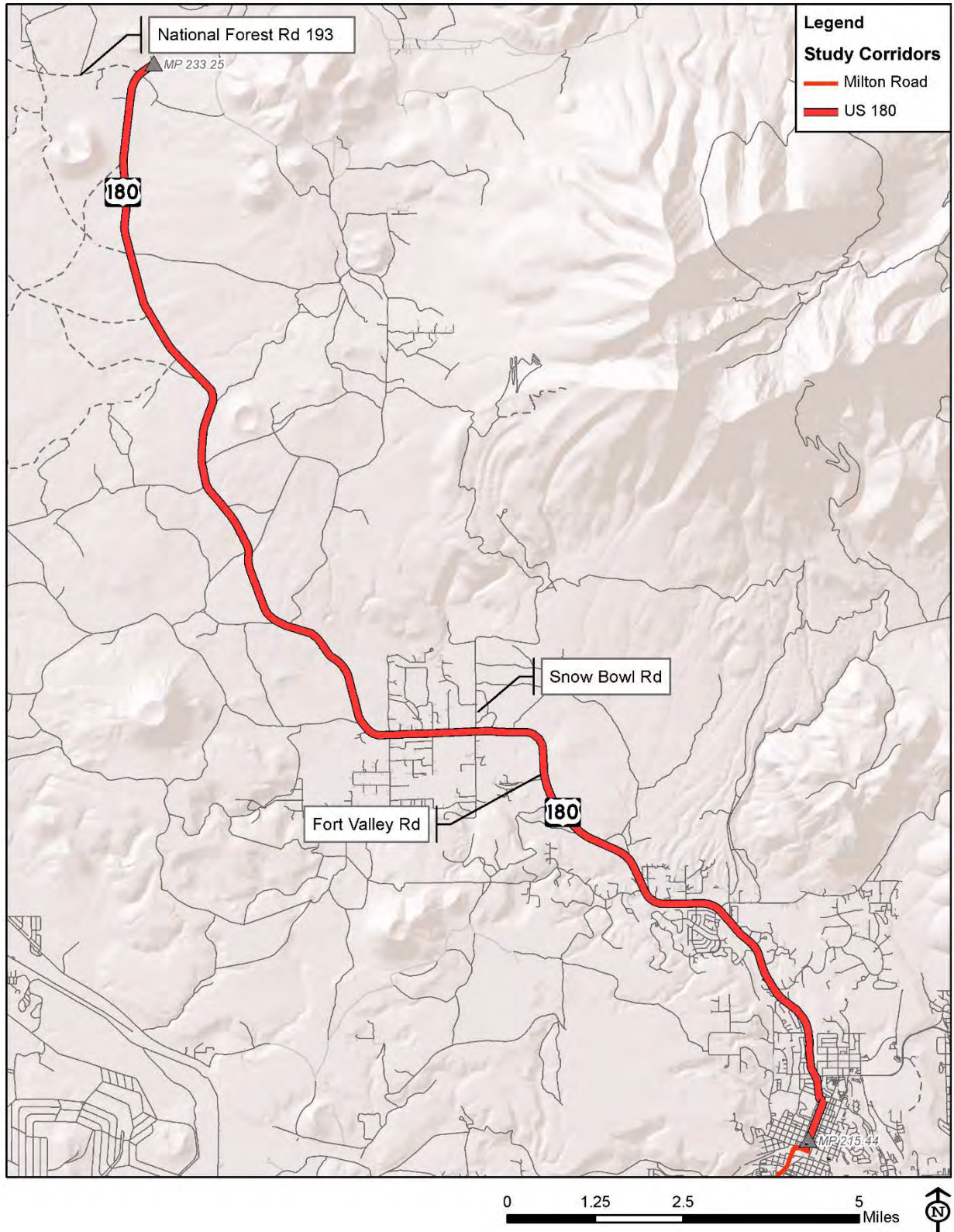
This segment of US 180 is also known as the Fort Valley Highway 180 Scenic Corridor and is designated by the State of Arizona as a Scenic Road for its rural character and mountainous setting around the San Francisco Peaks. US 180 is the primary arterial thoroughfare for the surrounding rural residents and is suitable for low volume residential traffic. However, visitors seeking access to the Grand Canyon, Arizona Snowbowl, and other recreational sites within Coconino National Forest are dependent on US 180. The winter season is particularly challenging for traffic circulation on US 180, and at peak times the corridor is seriously congested in a gridlock fashion, affecting local traffic while also posing a tremendous threat to emergency vehicle’s ability to effectively traverse the corridor. While the congestion problems are often viewed as the key issue, considering the challenges regarding bicyclists and pedestrians is essential. Addressing the traffic congestion while also implementing safe and efficient travel by all modes of transportation is the priority for US 180 CMP.



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

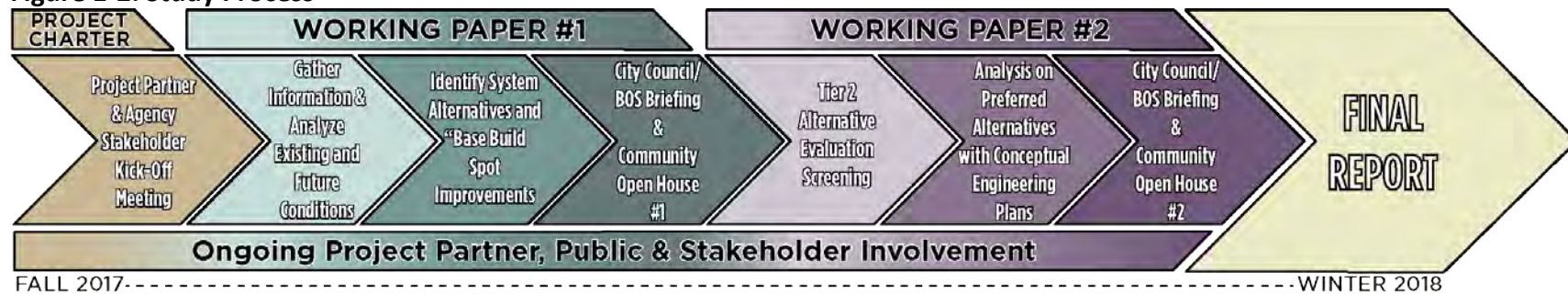
Figure 1-1: US 180 CMP Study Corridor



## Study Process

The US 180 CMP goal of identifying a shared vision for System Alternative(s) to alleviate traffic congestion and address safety issues. The study process will consist of the review of existing and future conditions, an understanding of previous relevant studies, extensive community and stakeholder input, and a quantitative evaluation process. The Project Partners will meet with the Study Team to provide guidance and oversight throughout the planning process. The extensive public and stakeholder involvement process will include meetings with the Coconino County Board of Supervisors, the Flagstaff City Council and two Public Open House meetings at key project milestones. As illustrated in **Figure 1-2**, the entire US 180 CMP process will occur over an approximate 14-month timeframe from the Fall of 2017 to the winter of 2018.

**Figure 1-2: Study Process**



## Working Paper 1 Objectives

Working Paper #1 is the first of two working papers for the US 180 CMP. The objectives of Working Paper #1 include:

1. Review and summarize pertinent information from previously adopted relevant plans, studies and reports.
2. Collect and analyze existing and future conditions relating to traffic and level of service characteristics, population and growth projections.
3. Provide an environmental overview of the US 180 corridor.
4. Identify, describe and depict the System Alternatives developed from existing studies and newly introduced concepts.
5. Identify a preliminary set of near term Base Build Spot Improvements that will complement and support the longer-term System Alternatives. The Base Build Spot Improvements will evolve and expand as Preferred Alternatives are identified and analyzed as a future task in the study process.



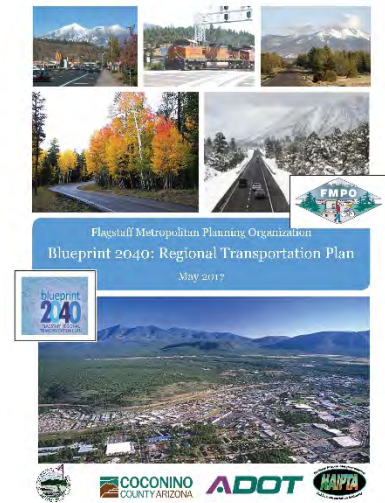
## CHAPTER 2: PREVIOUS & ONGOING STUDIES, PLANS & REPORTS

This chapter offers a review and synopsis of existing studies, plans or reports that may influence the planning process of the US 180 CMP. These studies and reports offer insights into the existing transportation issues and potential recommendations that may be associated with the US 180 corridor.

### FMPO Blueprint 2040: Regional Transportation Plan (FMPO, City of Flagstaff, NAIPTA, ADOT, Coconino County) 2017

This extensive plan and process recently culminated in May of 2017. “Blueprint 2040” sets transportation direction and priorities for Flagstaff and the surrounding Coconino County region. *Blueprint 2040* meets the Flagstaff Metropolitan Planning Organization’s (FMPO) federal mandate for regional transportation planning and the ideas presented in the RTP define the vision of the region and guide the transportation system infrastructure and investment choices that will serve the area best.

The RTP assumes that a continuation of the voter-approved Transportation Sales Tax (.00426) will extend for another 20 years beyond its current June 30, 2020 expiration date. The RTP notes that an extension of this sales tax would generate an estimated \$195 million over the 20-year period. These revenues would be used to fund (and/or partner with other state and federal agencies) transportation infrastructure projects identified in the RTP.



Key concepts or themes that the RTP addresses include:

#### Renewed commitment to Connectivity

- People Matter – an efficient system recognizes that time is valuable
- Smart and Connected Matters – connectivity provides choice, redundancy and shorter distances
- Environment Matters – a more efficient system for all modes is better for the planet

#### Renewed commitment to Multimodalism

- People Matter – health, safety and affordability benefits are gained from alternate modes
- Place Matters – human-scaled environments for walking and biking make places welcoming
- Prosperity Matters – walking, biking and transit allow for vibrant social engagement that energizes activity centers
- Environment Matters – non-motorized travel choices and efficient, well-designed motorized systems protect the natural beauty and health of the region

#### Renewed commitment to Partnership

- Cooperation Matters – government-to-government relations will be vital to achieve the system, project design and funding envisioned in *Blueprint 2040*



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

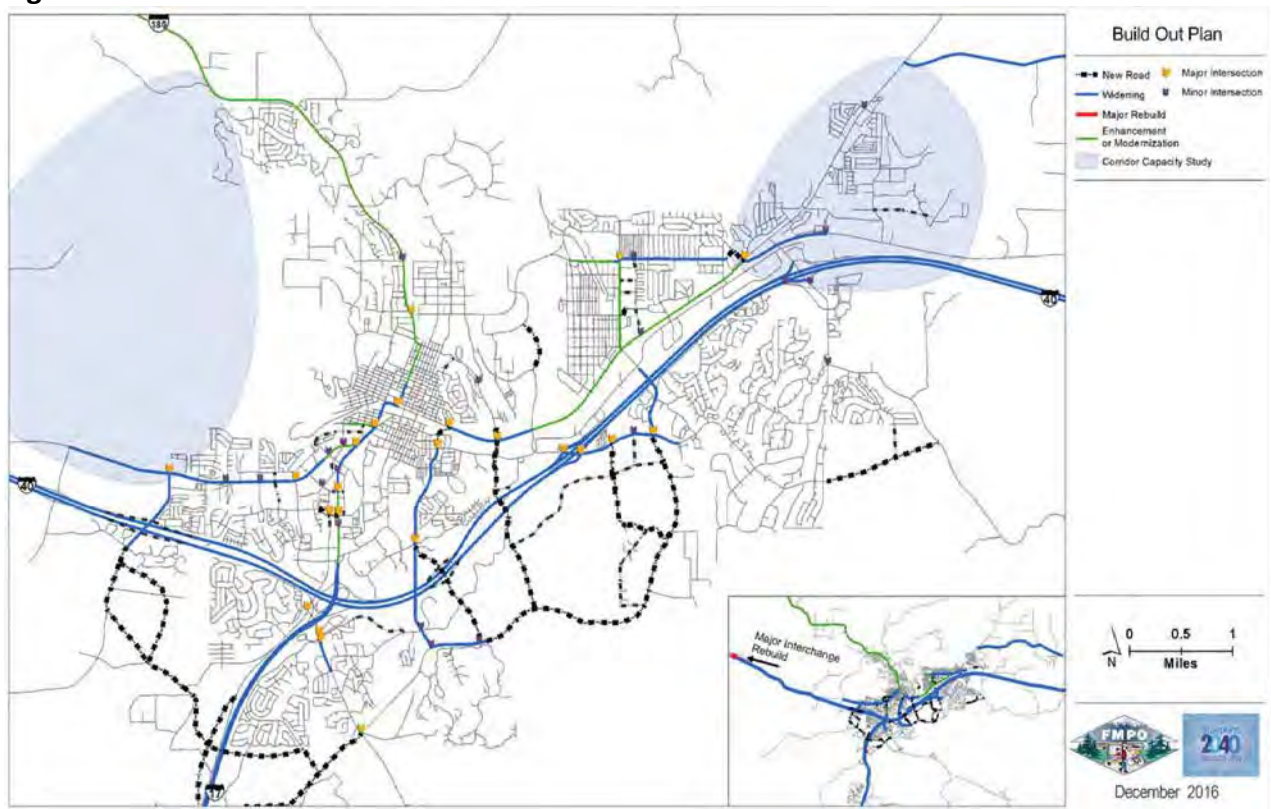
- Trust and Transparency Matter – *Transportation Decision 2000*, a series of dedicated sales tax propositions, started regional investments in transportation on an unprecedented scale. Dozens of projects have been promised and built, garnering public trust. *Blueprint 2040* is the next step in a trust-building dialogue between regional decision makers and the public.

The RTP plan and process was an extensive undertaking. A Steering Committee of 11 community leaders met over seven months to provide input on priorities. More than 600 people actively participated online and tens of thousands more were made aware through three *Cityscape* articles and numerous newspaper editorials and stories.

The RTP reviewed local and national trends and conditions, evaluated and ranked numerous project types with a series of performance measures for transit systems, roads and streets, pedestrian and bicycle facilities, and freight. A funding analysis was conducted over the various priority projects and ultimately a set of project priorities and program alternatives were recommended.

**Figure 2-1** identifies the roads and streets build out plan from the RTP. This includes road projects in the multimodal program recommended to be delivered in the next 20 years. Nearly \$280,000,000 in sales tax funds, grants and other revenues are projected to be available to deliver the projects in the RTP.

**Figure 2-1: Roads & Streets Build Out Plan**



*FMPO Blueprint 2040: Regional Transportation Plan, 2017*

**Figure 2-2** below provides a detailed listing of each of the projects by types, project/community rank, estimated cost and funding source. What is noteworthy for this US 180 CMP is that Milton Road widening ranked #1 amongst all project types, and is noted to be a “project of opportunity” in that



# US 180 CORRIDOR MASTER PLAN

## Working Paper #1 – Current & Future Conditions Report

additional project partners such as ADOT would be needed to successfully fund and construct this project. Important to note that the 20-Year Program Summary does not include a bypass alternative for US 180 because the plan does not support the bypass for two primary reasons. First, it is not clear that the majority of the region supports the facility. Second, it is expensive and largely serves a need experienced 15-20 days of the year, which is the relief from the three to four-hour traffic backups experienced during the holiday winter weekends.

**Figure 2-2: 20-Year Program Summary**

Project ID	Project Name	Rank	Years of Construction		Cost (2013 \$)	Finance
BRT	Bus Rapid Transit	26	2021		\$46,870,000	Loan/Grants
	Bus Rapid Transit - Operating		Annual \$1,250,000		\$25,000,000	Cash/Grants
LTR_43	Lone Tree Road widening South	8	2025		\$13,825,046	Bond
FOU_22	Fourth Street Bridge	15	2023		\$7,296,878	Bond
HCT_27	High Country Trail Extension	99	2036-2040		\$2,708,541	Cash
FOU_23	Fourth Street Widening	30	2025		\$6,004,460	Bond
	Soliere to Butler					
JWP_37	J.W. Powell (Airport)	12	2031-2035		\$11,494,668	Bond
LTR_42	Lone Tree Road widening North	6	2030		\$9,164,054	Bond
BUT_6	Butler Avenue Widening	9	2028		\$13,322,891	Bond
SW_Short	Short term sidewalks (100% draft ATMP** recommendation)	90	2021	2022	\$2,589,413	Cash
SW_Mid_1	Mid-term sidewalks (50% draft ATMP** recommendation)	91	2022	2026	\$5,888,332	Cash
X_Med	Crossings/Grade Separations	74	2022	2036-2040	\$12,100,000	Cash
MIL_54	Milton Road Widening*	1	Phased		\$36,559,211	Cash
Reserve	Projects of Opportunity*/Partnering		Annual \$1,250,000		\$4,000,000	Cash
			balance after Projects of Opportunity*			
Programs	TDM/ITS/etc.**		Annual \$600,000		\$12,000,000	Cash
Coconino	Unspecified County Project(s)		Varies		\$12,000,000	Cash
<b>Subtotal</b>					<b>\$220,823,494</b>	
	Inflation & Debt Financing***				\$59,176,506	
<b>Total</b>					<b>\$280,000,000</b>	
* Milton widening is assumed to be the project of opportunity for this program. Reserve funds would be applied to project costs. Project scope may be reduced or require more ADOT participation						
** ATMP is Active Transportation Master Plan, TDM is Travel Demand Management, ITS is Intelligent Transportation Systems						
*** Inflation and debt financing costs are presumed to be the balance of available funds						

Source: FMPO Blueprint 2040: Regional Transportation Plan, 2017



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## US 180 Winter Traffic Study (FMPO) 2012

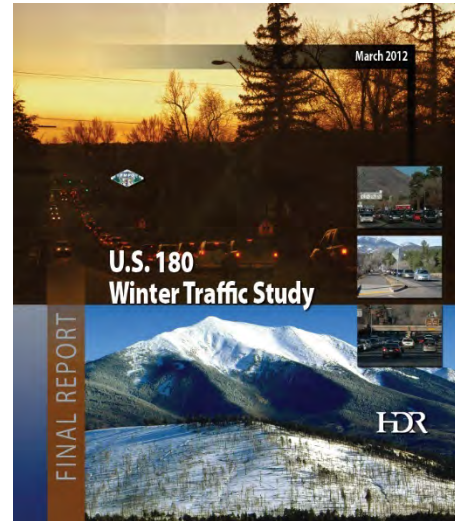
The *US 180 Winter Traffic Study* was prepared in response to increased congestion on US 180 as the primary route to ski and snow play areas, especially during long holiday weekends. On the six to eight holiday snow play weekends each year, visitors leaving the ski and snow play areas bring southbound travel to a virtual standstill on U.S. 180. Business and resort operators worried that the delays from the extreme congestion will discourage repeat ski and snow play visitors and have a long-term impact on the Flagstaff tourist economy.

This plan was developed to identify near, mid and long-term strategies to reduce winter traffic congestion on US 180.

A sampling of some of the key issues, observations and recommendations offered by the Plan include:

- Travel times on US 180 between Wing Mountain Snow Play Area and Route 66 nearly doubled between 3:00 pm and 5:00 pm when the winter recreation areas close.
- While there is traffic friction on US 180 from winter recreation activities, the traffic model suggested that key intersections on Milton Road are the main cause of lengthy congestion periods on US 180.
- Emergency responded, such as police, fire, and ambulance services, have experienced and fear longer response times and access challenges during the winter traffic congestion.
- Successful reduction in the duration of peak winter afternoon traffic congestion will require iterations where strategies are applied, evaluated and refined and require the cooperation of multiple agencies and stakeholders.
- Extensive public and stakeholder outreach was conducted with over 300 people offering comments and suggestions.
- Average daily traffic counts taken at several locations along US 180 showed moderate to substantial increase in daily traffic from routine weekends to the MLK holiday weekend.
- Over a three year sample period, 47% of all crashes along the US 180 corridor occurred on a Friday, Saturday or Sunday.

The Plan offers the following recommendations displayed in **Table 2-1**.





# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

**Table 2-1: US 180 Peak Winter Weekend Traffic Strategy Implementation Plan**

Priority	Strategy	Description	Time Frame
<b>Near-Term Strategies</b>			
1	Traffic Signal Timing	Add green signal time on southbound Milton Road at Butler Avenue and Route 66.	Tested in November, 2011, and implemented for 2011-2012 winter season
2	Traveler Information System	Provide travel time information to U.S. 180 travelers	Within five years
3	Traffic Signing Plan	Guide signs showing alternate routes and travel times; additional safety signing	Within five years
4	Early Departure Incentives	Coupons for local restaurants to encourage early departure	Within five years
<b>Mid-Term Strategies</b>			
5	Dispersed Snow Play Sites	New snow play sites outside the U.S. 180 corridor	5 to 10 years
6	Transit	New transit service to Snowbowl and Wing Mountain Snow Play Area	5 to 10 years
7	Managed Lane	Humphreys Street center left turn lane managed to accommodate southbound/ eastbound traffic	5 to 10 years
<b>Long-Term Strategies</b>			
8	New Road Capacity	Add capacity to corridor through either widening existing corridors or constructing a new road	10 to 20 years

Note, that this plan was published in 2012 and many of the strategies listed above have been implemented, particularly the Short- and Mid-Term Strategies.

Source: U.S. 180 Winter Traffic Study, HDR 2012

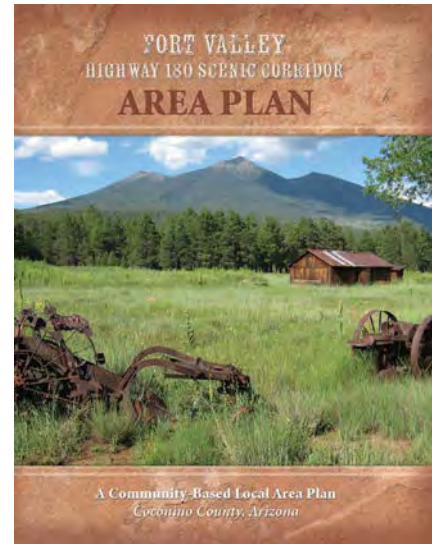


## Fort Valley Highway 180 Scenic Corridor Area Plan (Coconino County) 2011

The Fort Valley Highway 180 Scenic Corridor Area Plan is an amendment to the Coconino County Comprehensive Plan and is tailored to specific conditions in the Fort Valley Highway 180 Scenic Corridor. The purpose of this area plan is to guide development in the Fort Valley Highway 180 Scenic Corridor area for at least the next ten years. The overriding planning issue(s) driving the preparation of the Plan was the quality of life of residents and property owners, as well as visitors. Maintaining the aesthetic qualities of this rural area and desire to maintain an independent lifestyle without excessive regulation from the County is a balance that was sought and guided the planning process.

Some notable observations from this Plan include:

- Although the Planning Committee discussed winter traffic congestion at length, ultimately no attempt was made to resolve the issue because the Committee recognized that a regional, broad-based approach is needed and is being pursued by other governmental entities.
- Finding a suitable location for a bypass road (connecting US 180 to I-40) that is acceptable to residents and property owners of the planning area is a major obstacle because any bypass would negatively impact nearby residents, as well as natural features such as wildlife. In the absence of a specific proposed route to consider, the Planning Committee did not attempt to develop policies in relation to a bypass road.
- The existing road system of the planning area reflects the rural nature of the community, with many roads being unimproved and privately maintained.
- Residents generally promote the expansion of alternative modes of transportation.
- Transportation Goal #4: Encourage ADOT to widen shoulders along Highway 180 between the Flagstaff city limits and Snow Bowl Road to have consistent conditions that will enhance safety of bicyclists and others.
- Transportation Goal #5: Encourage ADOT to provide additional parking areas along Highway 180 for summer use.
- Transportation Goal #6: Coordinate efforts among the County, City of Flagstaff, and ADOT to enhance pedestrian and public transportation and the aesthetic appearance of Highway 180 in the area of a possible historical and cultural activity center at the southern end of the planning area.



## Lone Tree Road Corridor Study (City of Flagstaff/FMPO) 2006

The purpose of the *Lone Tree Corridor Study* was to identify and evaluate a potential gateway corridor to the central section of the City of Flagstaff in accordance with the city's Regional Land Use and Transportation Plan. This study focused on a north-south study area generally located in the vicinity of the current Lone Tree Road in order to enhance regional mobility, improve community and local circulation and minimize side friction between adjacent land uses and the corridor. The report was to be used as an adopted plan for the preservation of the Preferred Lone Tree Road corridor.

The study identifies a Preferred Alternative (**Figure 2-3**) that essentially includes a 4-lane collector roadway with raised median with bicycle and pedestrian facilities along both sides of the roadway. The report notes the need to enhance regional connectivity by establishing a traffic interchange to I-40 and a grade separated crossing over the BNSF railway mainline. This preferred alternative would also serve as an alternative route for snow travelers which would reduce congestion, especially along Milton Road .



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

Figure 2-3: Lone Tree Corridor Study Preferred Alternative



Source: Lone Tree Corridor Study, DMJM Harris | AECOM 2006



### Flagstaff High Occupancy Housing Draft Specific Plan (City of Flagstaff) July 2017

The goal of the *High Occupancy Housing (HOH) Specific Plan* is to produce a new Specific Plan for the City of Flagstaff that defines future urban patterns for High Occupancy Housing (HOH) developments while not neglecting the “active stewardship of the natural and built environment”. The HOH Specific Plan has been developed in response to community concerns surrounding some of the larger buildings recently completed or in development stages, particularly associated with the need for additional off campus student housing to accommodate current and future growth of the NAU student population. leading to increased daily congestion on Milton Road and is projected to get worse complicating peak winter traffic congestion.

The Plan defines HOH as, “a development with at least 30 units or 75 bedrooms per acre in dormitory or apartment-style units”. The Plan offers an extensive review of existing HOH developments (such as The Grove, The Standard, Village at Aspen Place, The Hub, etc.), history of the zoning and land use considerations influencing HOH developments, and site analysis and design considerations for future HOH opportunities in Flagstaff. The Plan concludes with a series of goals, policies and implementation strategies.

Key findings and considerations that influence transportation considerations include:

- Key activity centers and HOH sites are located along Milton Road.
- Three neighborhood scale activity centers along US 180 would allow for limited high density and HOH residential development.
- Description and location map of where HOH opportunities are currently allowed.
- In a 2014 survey of pedestrians, no or missing sidewalks or difficult crossings were the top reason that walking in Flagstaff was considered uncomfortable.
- Vehicle miles traveled per capita per day has dropped from 21 miles in 2007 to under 17 miles in 2016.
- There is a strong relationship between establishing HOH locations and multimodal mobility necessary to serve future HOH areas.



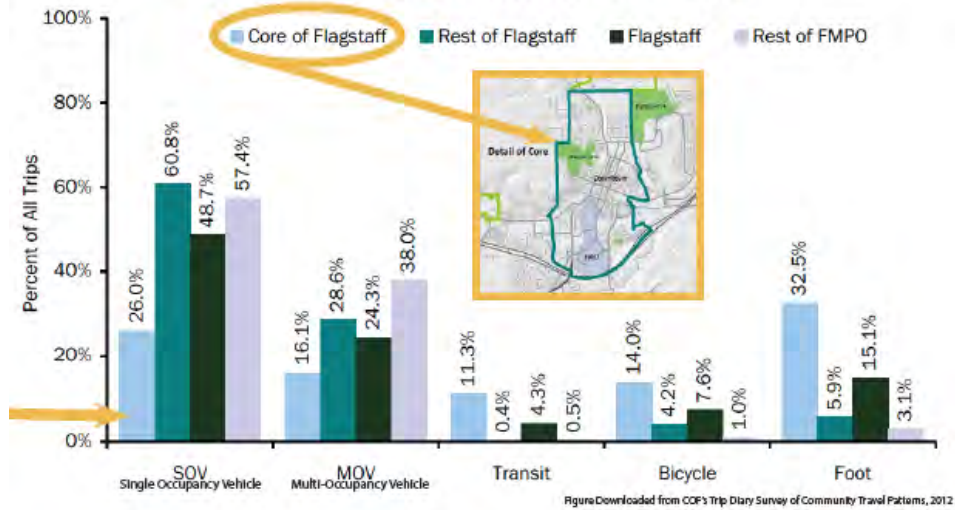
High Occupancy Housing  
DRAFT Specific Plan  
Public Review Draft - July 28, 2017



This public review draft is being distributed for a 60-day comment period. Comments should be submitted to the City by September 27, 2017 in order to be timely. Comments can be submitted to:  
Dora Decker, AICP  
Comprehensive Planning  
211 W. Aspen Ave.  
Flagstaff, AZ 86001  
Or email at:  
pdecker@flagstaffaz.gov



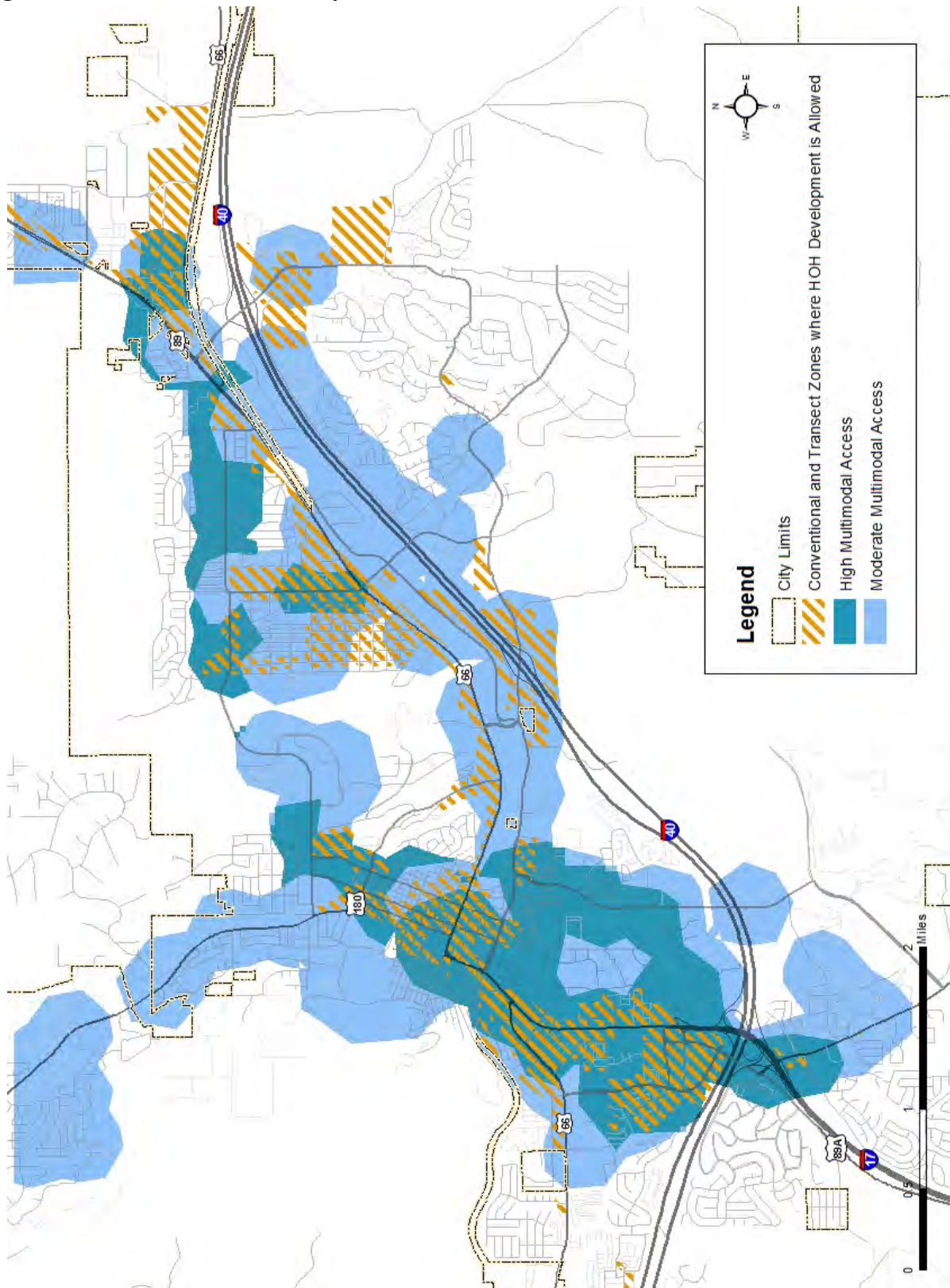
**Figure 2-4: Modal Share of All Trips by Area of Residence (2012)**



Source: City of Flagstaff High Occupancy Housing Draft Specific Plan



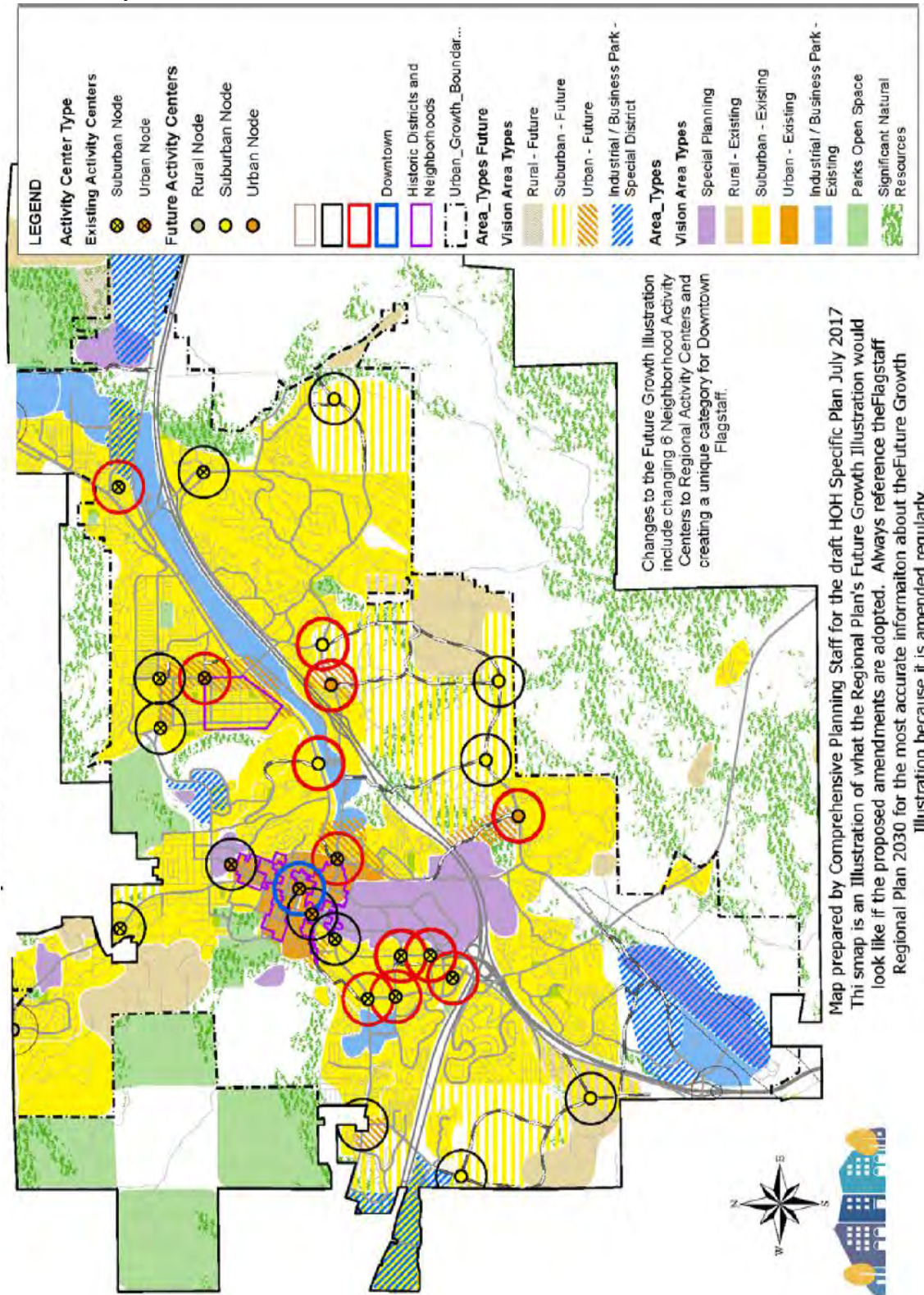
Figure 2-5: Potential HOH Development Zones



Source: City of Flagstaff High Occupancy Housing Draft Specific Plan



Figure 2-6: Proposed Future Growth Illustration



Source: City of Flagstaff High Occupancy Housing Draft Specific Plan





# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

## Beulah-University Alignment Study (City of Flagstaff) 2015

The purpose of the *Beulah-University Alignment Study* was undertaken to provide alignment alternatives and roadway cross-sections for Beulah Boulevard and University Avenue/Drive based on an analysis of study area constraints and anticipated traffic impacts of connecting Beulah Boulevard and University Avenue/Drive. The study was conducted in response to a proposed public-private partnership intended to relocate ADOT's current administrative offices at the southwest corner of Milton Road and University Drive in anticipation of commercial and mixed-use development opportunities.

The study conducted a capacity analysis (with growth scenario) and developed a series of conceptual and candidate alternatives that evaluated the advantages and disadvantages of the potential roadway alignment/connection of Beulah Blvd. to University Drive. The report also identifies adjacent site development characteristics/constraints, safety, cost, and multimodal design considerations to inform the public-private partnership process in their evaluation of the development potential of this property.



## Five-Year Transit Plan (NAIPTA) 2017

The Five-Year Transit Plan was adopted in December 2017 and was produced for NAIPTA's Mountain Line fixed bus service. The main focal point of the report is how NAIPTA should prioritize future service investments, specifically addressing the trade-offs between higher frequency service, longer spans of daily service, or increased coverage. The plan includes near-term goals through an enhanced short-term network under a budget similar to the existing, as well as a future funding scenario that includes a permanent transit network with greater coverage area and high frequency routes. The plan also includes transit-supportive policies and practices that should be implemented in the next five years. Milton Road is identified as one of the permanent transit routes in the permanent transit network as a north-south corridor connecting downtown with the Beulah Roads. However, Milton Road is also noted as a pedestrian-hostile roadway and notes the Beulah Road extension as a viable transit corridor with more opportunity to develop transit-oriented development. The five year transit plan also suggests relocating The Downtown Connection Center currently located to Phoenix Ave and Milton Road because access for busses and pedestrians is challenging due to the high speeds, congestion, limited turns and long waits associated with Milton Road/Historic Route 66 and the railroad.

Five-Year Transit Plan  
ADOPTED DECEMBER 7, 2017

For the Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA), Mountain Line



## NAIPTA Transit Spine Locally Preferred Alternative Final Report (June 2016)

The purpose of this project was to determine a Locally Preferred Alternative (LPA) for the Transit Spine cross-town transit connector. The Transit Spine is envisioned to be a corridor-based Bus Rapid Transit

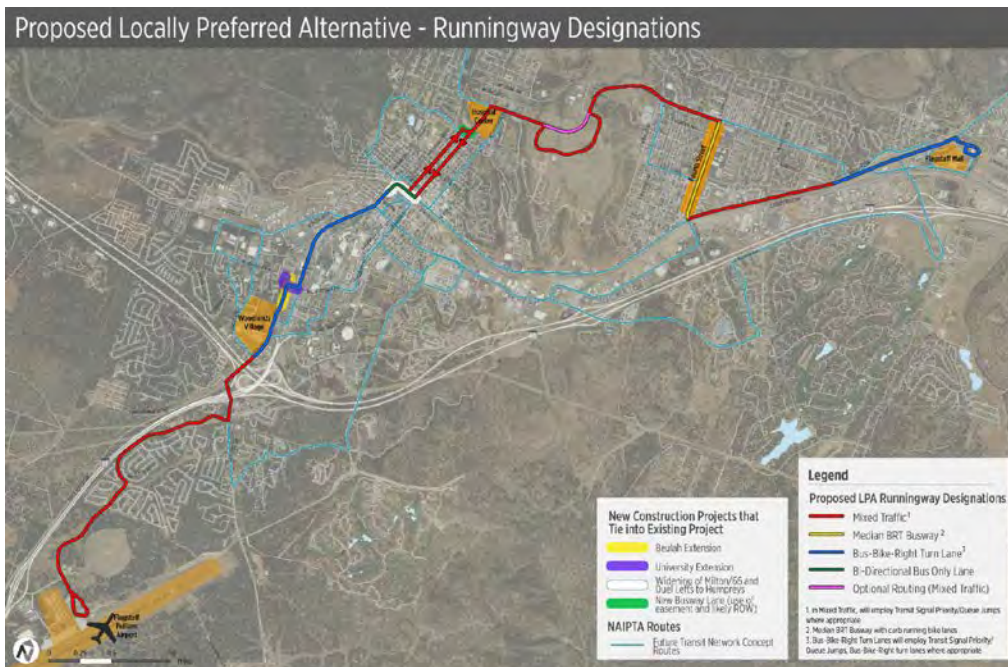


# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report

(BRT) service that connects key activity centers, including the airport, downtown and Flagstaff Mall. The Transit Spine will also provide enhanced transit service in Flagstaff, offering more convenient and attractive service than existing transit service and travel options in the area.

The selected LPA, considered to meet a NAIPTA project policy goal, is a corridor-based bus rapid transit service operating between the Flagstaff Mall and Flagstaff Pulliam Airport, on Marketplace Drive/South Mall Way, Route 66/89A, N. 4<sup>th</sup> Street, Cedar Avenue, Gemini Road, Forest Avenue, a one-way couplet of N. Humphreys Street (NB) and N. Beaver Street (SB), Rt. 66, S. Milton Road, W. University, S Beulah, Lake Mary Road, High Country Trail, and Pulliam to the Flagstaff Pulliam Airport.



## Flagstaff Regional Five Year & Long Range Transit Plan (NAIPTA/ADOT) 2013

The *Flagstaff Regional Five Year & Long Range Transit Plan* proposes a long-term vision for Flagstaff’s regional public transportation system and identifies and establishes a short-, mid-, and long-term service plan; funding plan; and implementation plan. Bus transit services were historically operated by Coconino County when in 2006, NAIPTA was formed to provide a regional approach to transit in and around Flagstaff. NAIPTA staff has successfully implemented several of the 2005 Plan recommendations, including implementing Mountain Link rapid bus service in 2011. With the accomplishment of many of the original goals, this Plan identifies a series of goals and objectives and short-term (years 1-5), mid-term (years 6-10) and long term (years 11-20) for transit services in the Flagstaff area.



# US 180 CORRIDOR MASTER PLAN

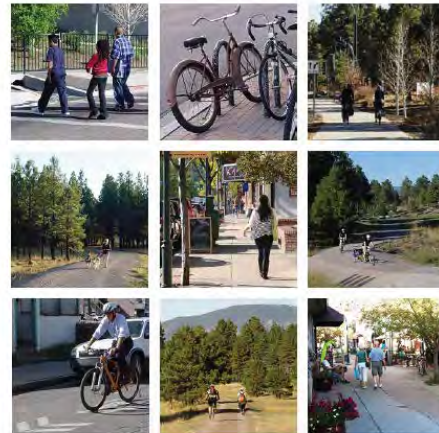
Working Paper #1 – Current & Future Conditions Report

## City of Flagstaff DRAFT Active Transportation Master Plan (City of Flagstaff and FMPO) 2015

The City of Flagstaff and FMPO are currently preparing an Active Transportation Master Plan to serve as a detailed guide to enhance walking, biking, and trails in Flagstaff. The Plan discusses and provides maps for existing and future proposed sidewalks, bike lanes (and bikeway networks), the Flagstaff Urban Trail System (FUTS), at grade and grade separated crossings and neighborhood connectors. This ongoing draft plan has many details, but some of the key takeaways include:

- There are approximately 300 miles of existing sidewalks in Flagstaff, but there are 60 miles of missing sidewalks along major streets
- The missing sidewalks have been inventoried and prioritized totaling \$37.5 million in sidewalk improvements
- There are approximately 130 miles of existing bike lanes and shoulders on Flagstaff streets, but there are about 53 miles of missing bike lanes from candidate city streets.
- 22 miles of the missing 53 miles of bike lanes could be completed by providing striping to existing facilities at an estimated cost of \$1.84 million.
- 13 miles of additional bike lanes require reconstruction at an estimated cost of \$6.72 million
- The FUTS system is a shared use path that connects neighborhoods, shopping, employment areas, schools, parks and the surrounding National Forest.
- Presently, there is 56 miles in the FUTS system, 75 miles of planned trails for a total of 130 miles planned for the FUTS system.
- There are 1400 existing at-grade pedestrian crossings in Flagstaff. There are 65 new locations where additional at-grade crossings are needed.
- According to the study, US 180 has 11 potential crossing locations between Route 66 and Shultz Pass Road.

### City of Flagstaff Active Transportation Master Plan



## CHAPTER 3: PUBLIC & STAKEHOLDER ENGAGEMENT

Public and Stakeholder engagement in the US 180 CMP is imperative to the success of this project.

### Public Engagement Goals & Objectives

- Enhance and broaden the awareness of this project.
- Promote an understanding of purpose and need for the US 180 CMP.
- Provide ample opportunities for residents, business owners and stakeholders of Flagstaff and Coconino County to provide input during the study process, and prior to recommendations being made.

There are a considerable number of individuals, agencies, interested stakeholders and community members that will assist and guide in the preparation and recommendations developed in the US 180 CMP.

### Project Partners

The ADOT Multi-Modal Planning Division is conducting this study in cooperation with several Project Partnering Agencies committed to preparing a long-term CMP for US 180. A Project Partner is a stakeholder who is actively engaged in the leadership of the project by helping develop the project charter that includes a mission statement, values, goals and objectives. Project Partners will meet at least bi-monthly, review deliverables, provide strategic direction, and input through the duration of the CMPs. The Project Partnering Agencies for this project include:



**Arizona Department of Transportation (ADOT)**



**Flagstaff Metropolitan Planning Organization (FMPO)**



**Coconino County**



**Northern Arizona Intergovernmental Public Transit Authority (NAIPTA)**



**Burlington Northern Santa Fe (BNSF)**



**United States Forest Service (USFS)**



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report



**City of Flagstaff**



**Federal Highway Administration (FHWA)**



**Northern Arizona University (NAU)**

## Project Stakeholders

Project Stakeholders include representatives from the Partner agencies, but also include an expanded group of representatives from other agencies and organizations. The Project Stakeholders will meet with Project Partners at key milestones to review and provide input on major deliverables. An Agency Stakeholder list will be provided to the Project Partners for review.

The Project Partners and Project Stakeholders are tasked with overseeing the project study team's efforts over the course of the entire process. They will review draft documents, attend meetings at key project milestones and offer feedback and guidance to ensure that the CMP meet desired project goals and objectives. Project Stakeholders will also assist the study team in advertising, communicating and delivering public notices for public open house meetings and scheduled meetings with elected officials to receive project updates at key project milestones.

## Project Partner Charter

On August 2, 2017, a Project Partner Charter was developed as a formal expression of the partnership values, mission and goals that the Project Partners are committed to for the duration of this project (**Figure 3-1**). The Charter will continually serve as a guide to ADOT and its Project Partners to develop, maintain and enhance the partnership for the US 180 CMP process. The Charter helps create and maintain is a plan for project success by;

1. Creating goals, values and structure to a process that may have multiple, varied viewpoints on key project issues.
2. Serving as a conflict prevention tool designed for project partners to avoid be reminded of the project mission, values and goals in the event that future conflict arises.



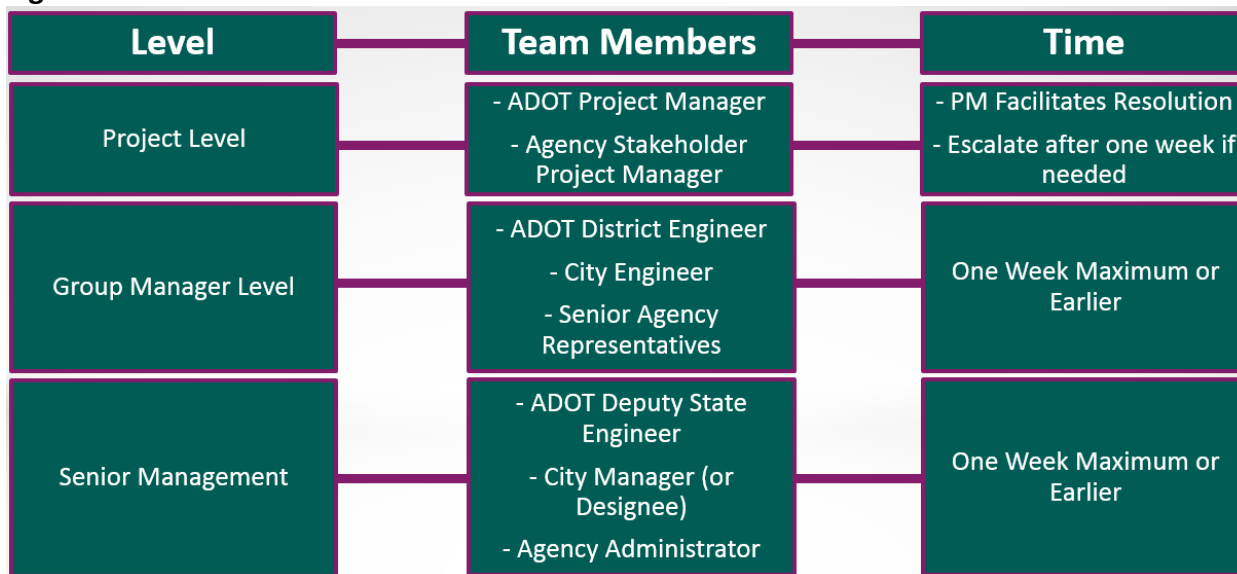
Figure 3-2: Project Partner Charter



## Issue Escalation Ladder

In instances where certain project types can generate multiple points of view or opinions on how to achieve commonly held objectives, issues or disagreements may arise over the course of the project. For several years, ADOT has been utilizing a “issue escalation ladder” that is intended to be utilized for resolving issues when and if they should arise (**Figure 3-3**). Originally developed for use on construction projects, a less rigid but constructive issue escalation ladder is established for the US 180 CMP.

**Figure 3-3: Issue Escalation Ladder**



## Public Involvement Plan

A complete Public Involvement Plan has been prepared as a separate and detailed document to describe the objectives, stakeholder engagement opportunities, key messages and various public outreach tools and methods that will be employed throughout the life of the US 180 CMP process. The full Public Involvement Plan for the US 180 CMP can be found in Appendix X. The discussion below represent select excerpts from the Public Involvement Plan.

## Public Outreach Methods

The goals and objectives for the US 180 CMP – alleviating congestion levels have been a source of local community dialogue for quite some time. Due to the nature of this project, it is inherit that the success of this project in large measure will be the ability to obtain an informed consensus and community acceptance for the preferred alternative(s). The goal of any public outreach effort is to educate the public on the study, provide opportunities for public and stakeholder input at key project milestones and build an informed consensus for study recommendations.

In response to these project needs and objectives, a robust public and stakeholder engagement plan has been prepared. The project team will conduct a two-phase approach to obtain public input at key project milestones. Two public open house meetings will be conducted – the first is intended to solicit input and feedback on the System Alternatives and which alternatives are being recommended for



further study. The second public open house meeting will focus on the review and comment of the recommended alternatives.

This study process will also include two Flagstaff City Council and Coconino County Board of Supervisor briefings to obtain their feedback and guidance at key project milestones.

A project website has been established to serve as a hub for all project information. ADOT is hosting the website at:

- [www.azdot.gov/MiltonCorridorMasterPlan](http://www.azdot.gov/MiltonCorridorMasterPlan)
- [www.azdot.gov/US180CorridorMasterPlan](http://www.azdot.gov/US180CorridorMasterPlan)

This project website will serve as a repository for project documents as well as a virtual notice board for upcoming meetings, surveys, and social media. Other participation tools can be embedded in or linked to from the main project webpage.

This project will utilize several traditional and electronic tools and methods to notify interested stakeholders, business owners and residents of project updates, public open house meetings and other project information at key milestones over the course of the planning process. Press releases and meeting notifications will be coordinated with outlets such as the Arizona Daily Sun, Flagstaff Business News, Greater Flagstaff Chamber of Commerce, ABC 15 and KAFF News to name a few.

Please see Appendix X for a complete copy of the “Public Involvement Plan” for the US 180 CMP for a more complete description of the public and stakeholder outreach methods.





## CHAPTER 4: EXISTING LAND USE, DEMOGRAPHIC & SOCIO-ECONOMIC CONDITIONS

### Land Ownership

As **Figure 4-3** clearly demonstrates, the United States Forest Service is the largest landowner (Coconino National Forest) along the 17 mile US 180 CMP corridor. The areas within the current Flagstaff municipal limits are almost entirely owned by private ownership interests. Private ownership interests are also centralized in the Fort Valley/Baderville area along both sides of US 180 between Snow Bowl Road (FS 516) and Bader Road.

### Existing Land Use & Activity Centers

Existing land uses along the US 180 corridor evolve from an urban/suburban setting along the southern portions of the US 180 CMP corridor near the City of Flagstaff and transition to more rural residential and natural area open spaces (Coconino National Forest) along the central and northern segments of the US 180 CMP corridor.

Describing the corridor from south to north, along Humphrey’s Street in downtown Flagstaff, a diverse mixture of urbanized land uses including Flagstaff City Hall, Wheeler Park, Marriott Residence Inn, various shops and restaurants and convenience commercial uses catering to locals and tourists dominate the road frontage along Humphrey’s Street from Milton Road to Columbus Ave. Flagstaff High School, Bashas’ grocery store and other retail services are located at/near the Columbus/Fort Valley Road (US 180) intersection. Some other noteworthy destinations along US 180 include Pioneer Museum, Coconino Center for the Arts, and Flagstaff Arts and Leadership Academy.

Moving north along the corridor, a series of low to medium density single family residential homes, 2-3 multiple family residential communities, intermittent commercial services, Sechrist Elementary School and the Museum of Northern Arizona are found along US 180 to Shultz Pass Road.

Moving north, the land use landscape becomes distinctively more rural in nature as it continues through Fort Valley Ranches and the Baderville area. Snow Bowl Road provides access to Snow Bowl Ski Resort.

Continuing north, open spaces of the National Forest dominate the US 180 corridor landscape and the winter recreation areas of Wing Mountain Snow Play Area, Arizona Nordic Village, and Crowley Pit are located.

The Wing Mountain Snow Play Area has been a popular family destination attracting thousands of visitors every snow season. On peak winter usage, up to 1000 visitors were not uncommon. The facility has 500 parking spaces. However, the operator canceled their special use permit to operate the facility and Wing Mountain is closed for the 2017-2018 winter recreation season and most likely into the foreseeable future.

The Arizona Nordic Village has also been a popular winter (and summer) destination for cross country skiing, snowshoeing and other outdoor adventures. Also operated under a special use permit from the USFS, the destination remains popular and will likely expand its operations in the coming years.

Crowley Pit has historically been a smaller and less formal snow play area, but it too is closed for the 2017-2018 snow season. Challenged by the lack of structured parking, “No Parking” signs have been



placed along the shoulders of US 180 (near Crowley Pit and beyond) to assist with in the safety in the area.

## Existing Zoning

Consistent with the existing open space land use and ownership patterns, the vast majority of the lands in the US 180 CMP study area are zoned “Open Space and Conservation” by Coconino County. Please see **Figure 4.4** for additional detail.

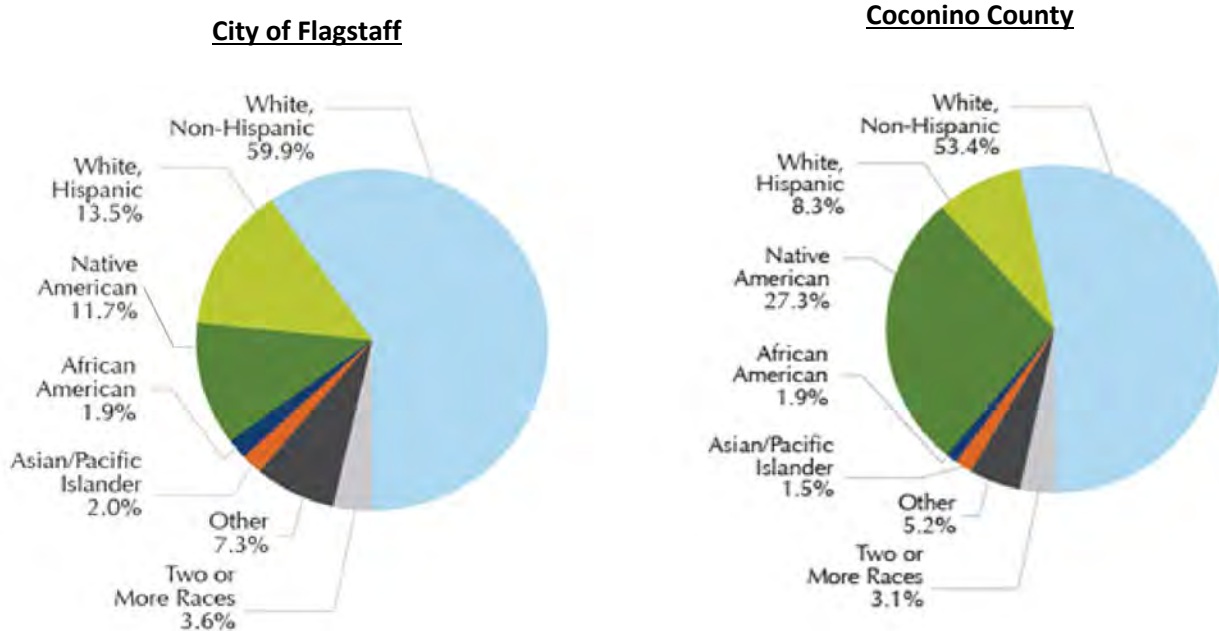
Private properties located in the Fort Valley/Baderville area are zoned low density rural residential districts that include Rural Residential 2-acre minimum, 2.5-acre minimum and 4-acre minimum under the Coconino County Zoning Ordinance.

## Demographic & Socioeconomic Conditions

### City of Flagstaff & Regional General Demographic & Socioeconomic Information

According to the US Census Bureau, the 2016 estimated population of Flagstaff was approximately 71,000 (US Census Bureau, Population Division, 2017). **Figure 4-1** shows that both the city (approximately 40%) as well as Coconino County (46%) are both ethnically diverse with prominent minority populations.

**Figure 4-1: Flagstaff and Coconino County Ethnicity**

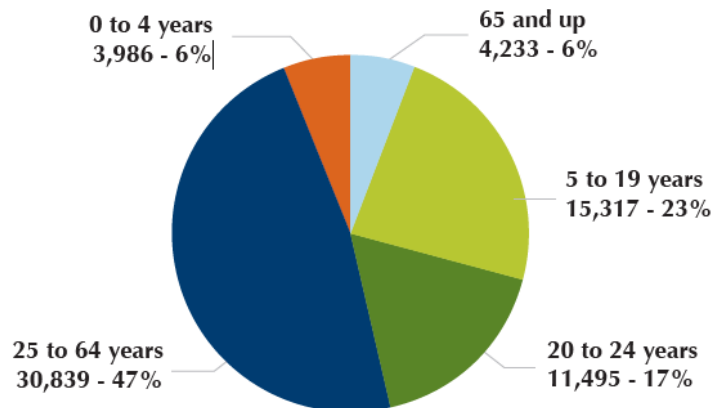


Source: 2010 U.S. Census Bureau, decennial census

The population growth occurring over the last two decades is largely connected to the growth and development of Northern Arizona University which currently has over 21,000 students enrolled (HOH Study). **Figure 4-2** shows that the majority of the population (47%) is between 25 to 64 years old and the median age of approximately 26 years old which is lower than the state of Arizona median age of 36 years old.



**Figure 4-2: City of Flagstaff Population Age**



Source: 2010 U.S. Census Bureau, decennial census

The large student population and generally young community members also effects the housing situation where the city has traditional homes with families as well as a large number of individuals living alone. On the other hand, almost 20% of the housing unit within the are non-family households because of the student population. Unlike other communities, the large student and young population is also related to how the majority of the residents have rental homes (55%) whereas only 45% of the homes are owner occupied (<https://population.az.gov/census-data>). The City also has an undersupplied housing market which leads to affordability issues and a high amount of rental properties. The 2016 median housing sale price is \$315,500 while the median household income is approximately \$49,000 (U.S. Census Bureau). 24% of the Flagstaff population is living in poverty.

### Demographic & Socioeconomic Data Adjacent to the US 180 Corridor

Depicted in **Figure 4-5**, the US 180 corridor extends through four census tracts which include Census Tract 1, 2, 11.12, and 22. Utilizing data generated from the U.S. Census Bureau, some information connected to transportation issues were pulled to highlight socioeconomic and demographic conditions directly adjacent to the US 180 corridor in **Figure 4-6** through **Figure 4-8**.

There are a higher number of total residents (8,463 to 9,913 residents) within Census Tract 2, but Census Tracts 1,2 and 12 have a higher population. Census Tract 22 is large in size compared to the other tracts and is primarily open rural land so that is why there is less population density. Census Tracts 1 and 2 also have a higher percentage of the people living below the poverty line. Similar to population, the high number of people living below poverty Census. On the other hand, Census Tracts 22 and 1 have an older population compared to the other Census Tracts as many retirees seek the quiet real life to escape hectic urban lifestyle. The high density of people, low income, and a generally young population takes place along US 180 to the south which is a recipe to generate a high volume of trips through alternative modes of transportation, however, the US 180 corridor currently does not have adequate infrastructure to support the high demand.



Figure 4-3: US 180 Corridor Land Ownership

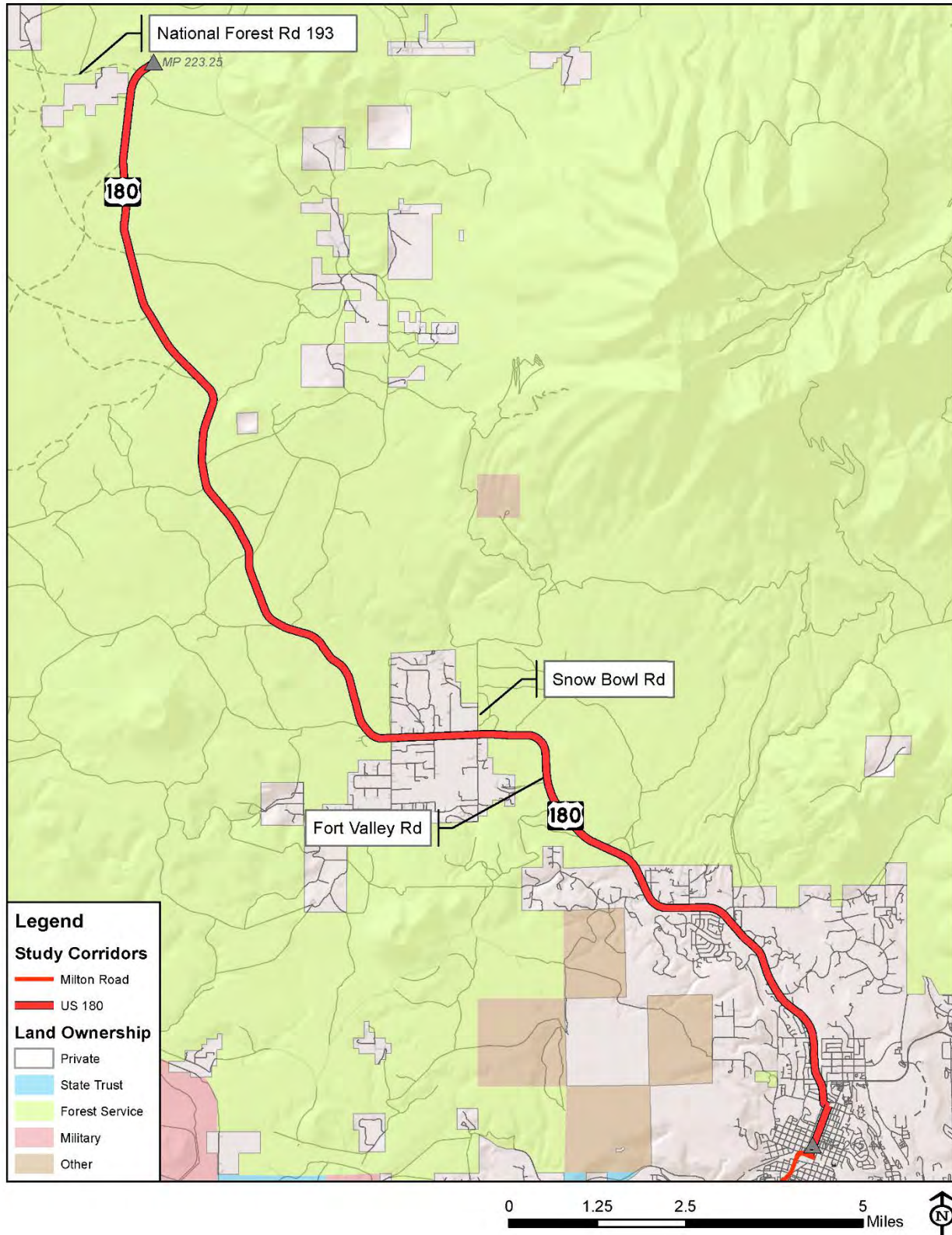


Figure 4-4: US 180 Corridor Existing Zoning

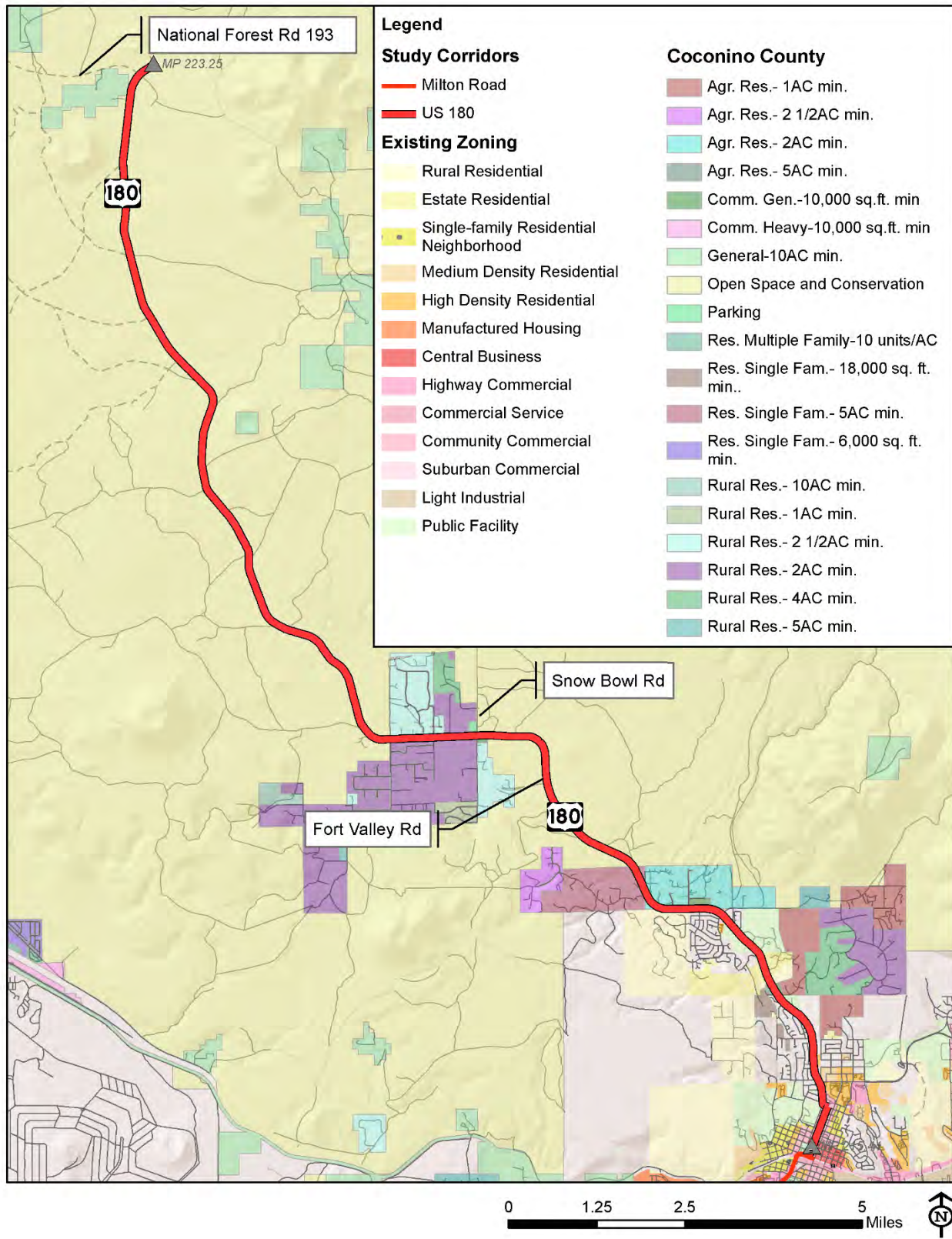


Figure 4-5: US 180 Corridor Adjacent Census Tracts

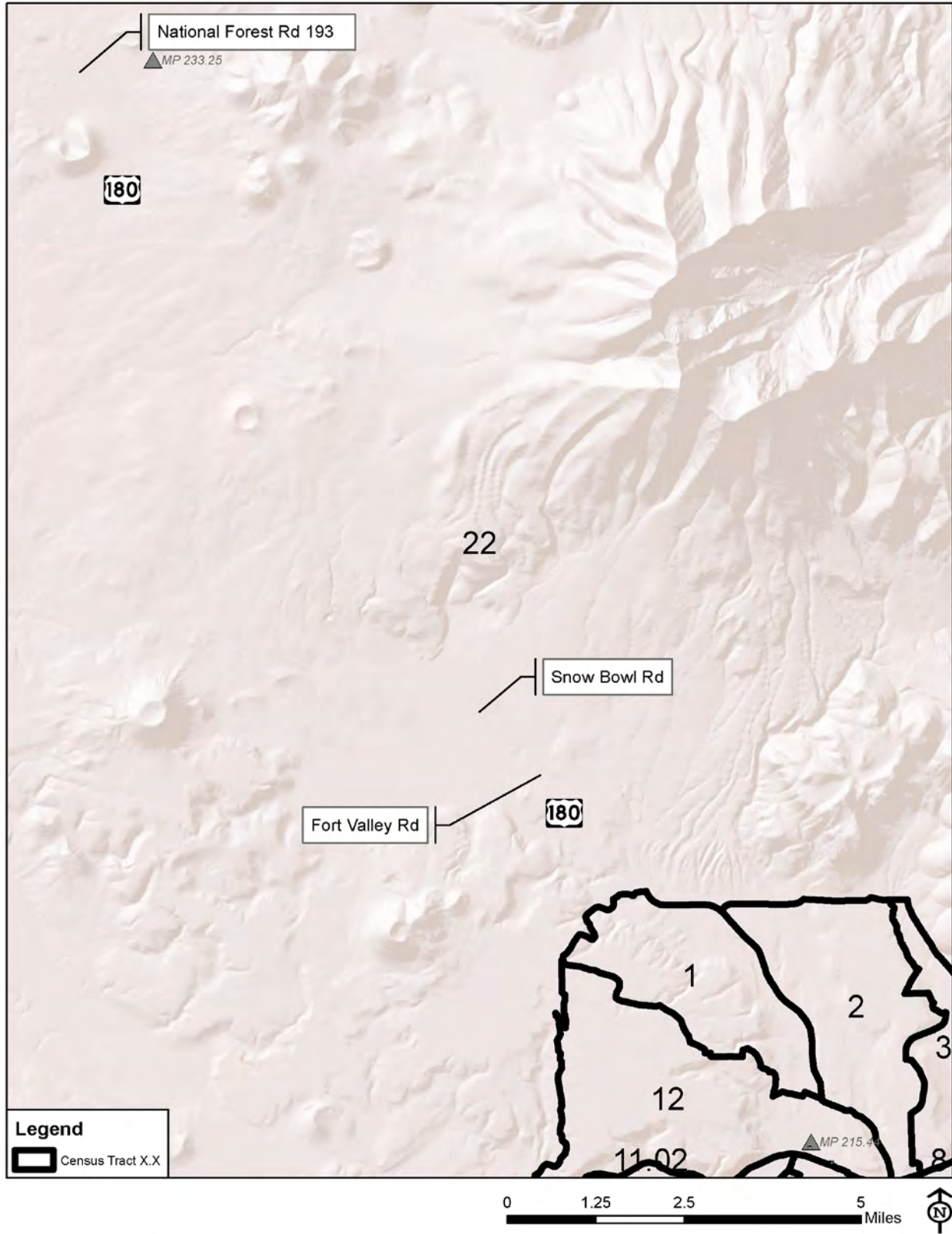


Figure 4-6: US 180 Corridor Percent of Population Living Below Poverty

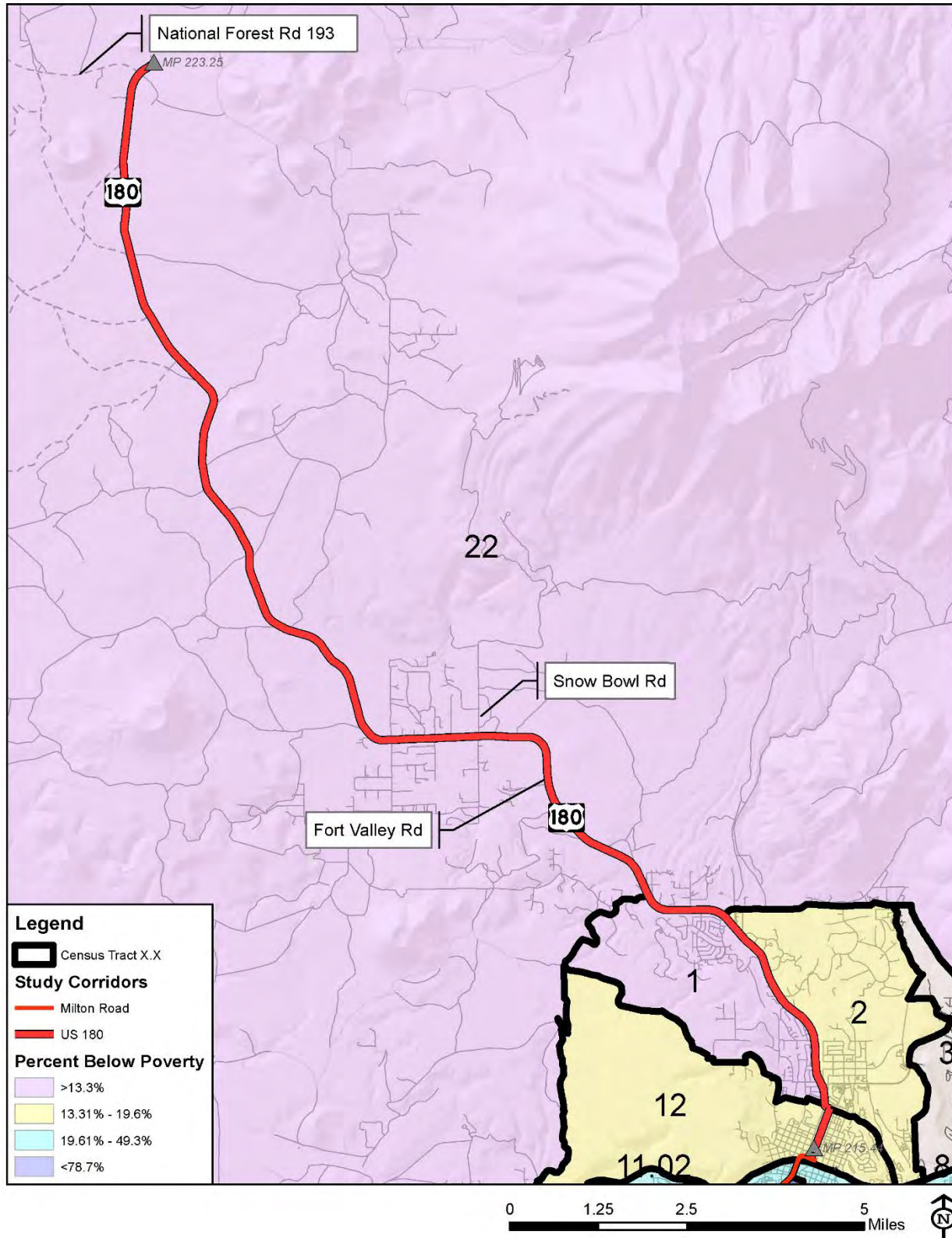


Figure 4-7: US 180 Percent of Population 65 years of Age and Older

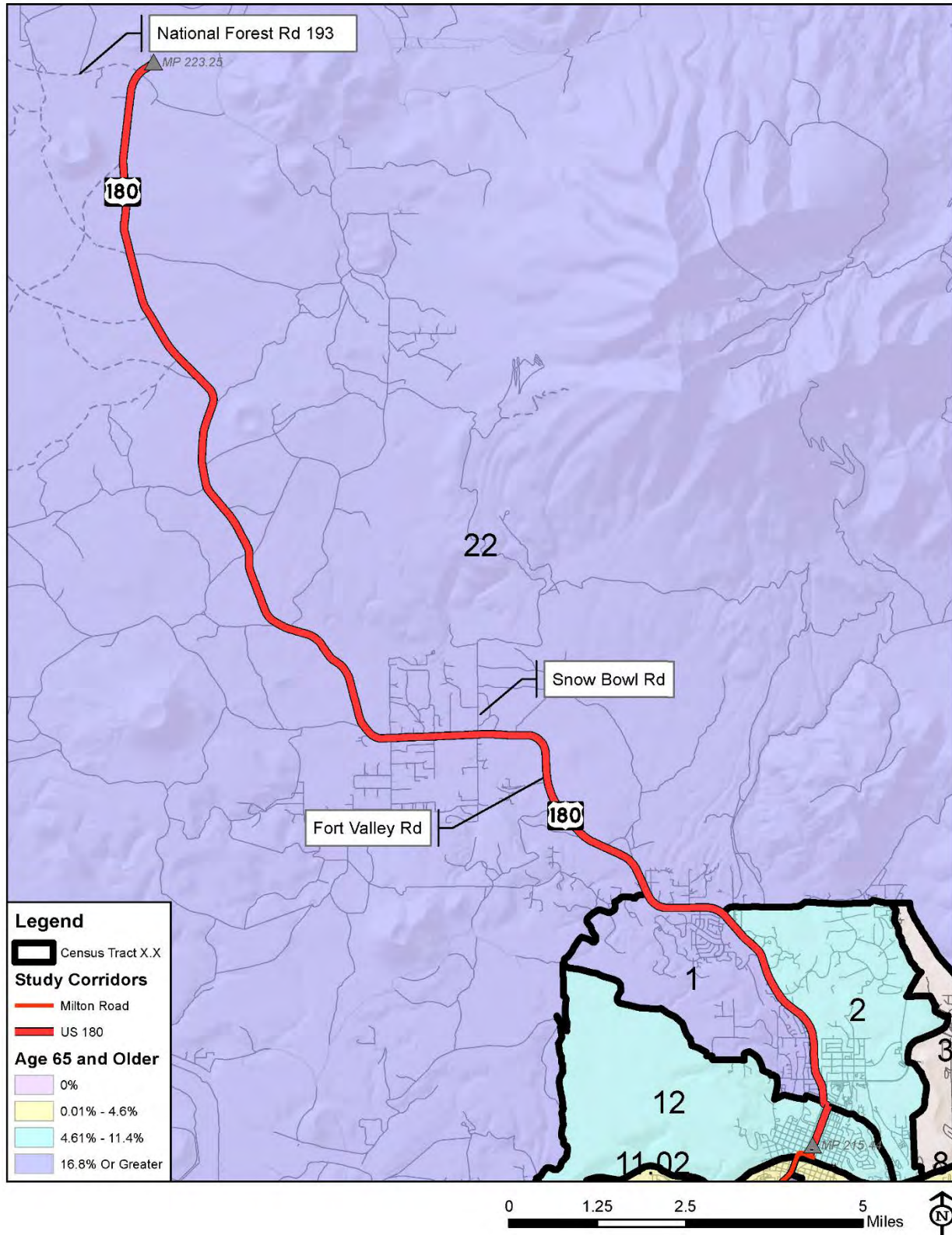
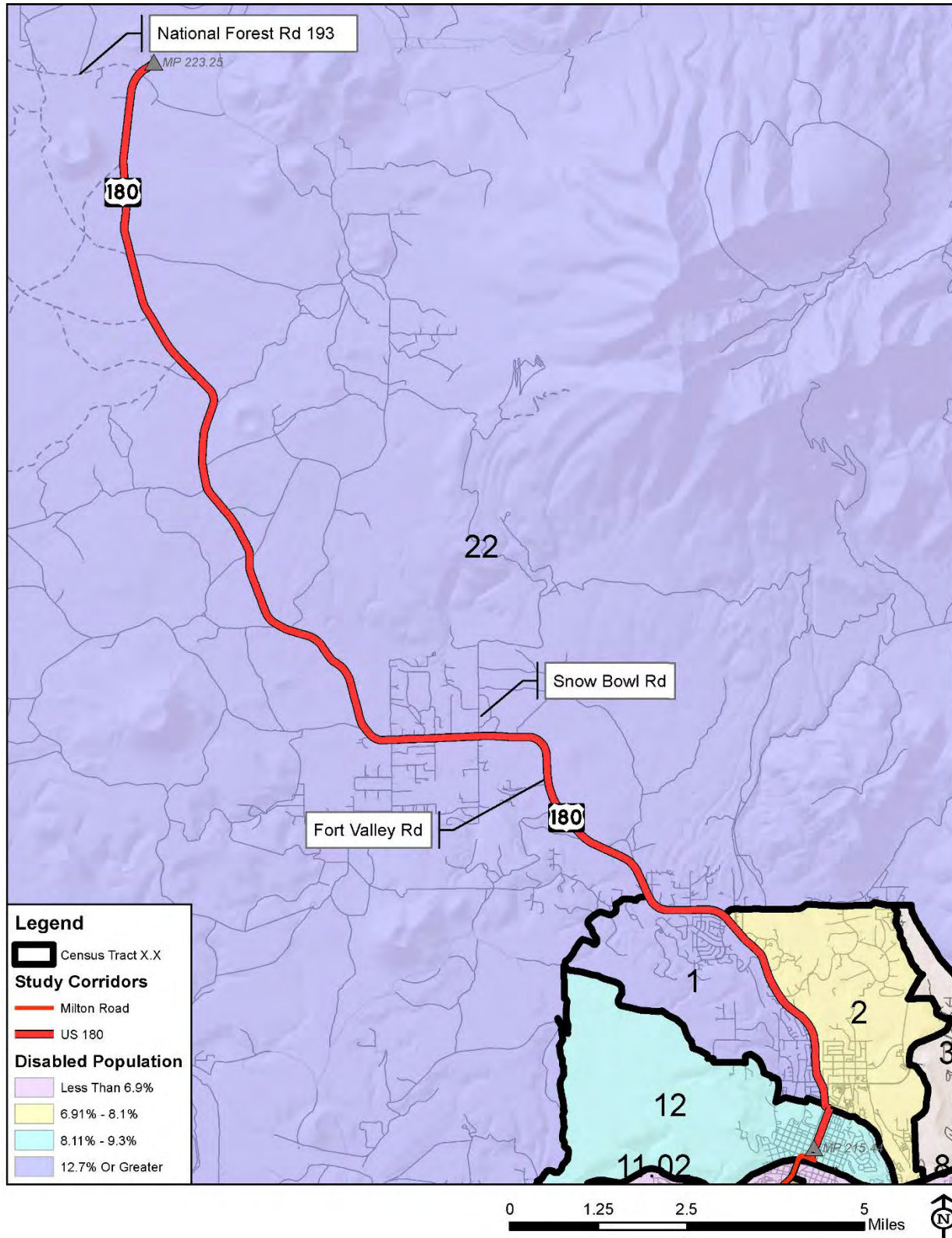




Figure 4-8: US 180 Percent Disabled Population



## CHAPTER 5: EXISTING ROADWAY & CORRIDOR CONDITIONS

The major elements of the existing transportation system are documented in this section and summarizes the status/condition of each element. Major elements include roadway configuration, bridges, pavement conditions, roadway/intersection operation and performance, non-motorized modes of transportation within the study area.

### Functional Classification

Functional classification is the grouping of streets and highways into classes according to the character of service in which they are intended to provide. **Figure 5-1** and **Figure 5-2** depict the current FHWA approved functional classification for roadways within the study area. Roadways that are not functionally classified by FHWA are not eligible for federal funding. The functional classification of the roadways within the study corridor are as follows:

- FHWA/ADOT functional classification – Humphreys Street/US 180 is classified as a Minor Arterial from SR 40B to Peak View Street (approximately 0.3 miles west of Shultz Pass Road). West of Peak View Street, US 180 is classified as a Major Collector. The intersecting streets on Humphreys Street / US 180 are classified as local roads and Major Collectors (Aspen Avenue, Birch Avenue, Cherry Avenue, Columbus Avenue, Forest Avenue, Navajo Drive, Meade Lane and Shultz Pass Road).
- City of Flagstaff functional classification – Humphreys Street / US 180 within the study corridor is classified as a Major Arterial. The intersecting streets on Humphreys Street / US 180 are classified as local roads, Minor Arterials (Columbus Avenue east of Humphreys Street / US 180 and Forest Avenue), and Minor Collectors (Aspen Avenue, Birch Avenue, Cherry Avenue, Elm Avenue west of Humphreys Street / US 180, Navajo Road, Beal Road, Meade Lane, Fremont Boulevard and Peak View Street).

### Roadway and Lane Configuration

The US 180 CMP study corridor is primarily a three-lane corridor with one through lane in each direction and a center two-way left-turn lane south of Shultz Pass Road. Between Shultz Pass Road and the Wing Mountain Snow Play Area, US 180 is a two-lane roadway with one lane in each direction with the exception of the vicinity of Snow Bowl Road. US 180 widens to a three-lane roadway in the vicinity of Snow Bowl Road with one lane in each direction and a two-way left-turn lane. Dedicated left-turn and right-turn lanes exist at intersections. Curb, gutter and sidewalk exists on both sides of Humphreys Street. Curb, gutter and sidewalk does not exist on most of the US 180 CMP study corridor. **Figure 5-3** depicts the existing lane configurations and left/right-turn lane lengths at the following intersections along the study corridor:

- Columbus Avenue,
- Forest Avenue, and
- Shultz Pass Road.



## Posted Speed Limits, Traffic Control and Lighting Conditions

### Posted Speed Limit

The posted speed limit on Humphreys Street / US 180 is 25 miles per hour (mph). The posted speed limit on US 180 is 35 mph between Humphreys Street and Creekside Drive, 45 mph between Creekside Drive and Forest Hills Drive and 55 mph between Forest Hill Drive and the Wing Mountain Snow Play Area.

### Traffic Control

**Figure 5-4** and **Figure 5-5** depict the traffic control for the study area intersections along the along the US 180 study corridor. In addition to the traffic signals, there are several stop controlled intersections along the corridor. On Humphreys Street, the stop controlled intersections are located at approximately 360 feet along the roadway.

### Lighting Conditions

Adequate lighting is essential for the effective operations of an arterial roadway, particularly to improve intersection sight distance during the night time. However, due to Flagstaff's and Coconino County's stringent lighting codes, additional street lights will only be placed where desperately needed.

Roadway lighting along the US 180 corridor is as follows:

- East side of Humphreys Street between Milton Road and Columbus Avenue/US 180,
- West side of US 180 between Humphreys Street and Meade Lane,
- East side of US 180 between Meade Lane and Louise Lane,
- East side of US 180 between Creekside Drive and Research Center Drive, and

Roadway lighting does not exist on US 180:

- Between Louise Lane and Creekside Drive,
- Between Research Center Drive and Shultz Pass Road with the exception of one street light at Valley Crest Street, and
- Between Shultz Pass Road and the Wing Mountain Snow Play Area.

Intersection lighting exists at the study area signalized intersections.



**Figure 5-1: FHWA Functional Classification of Roadways**

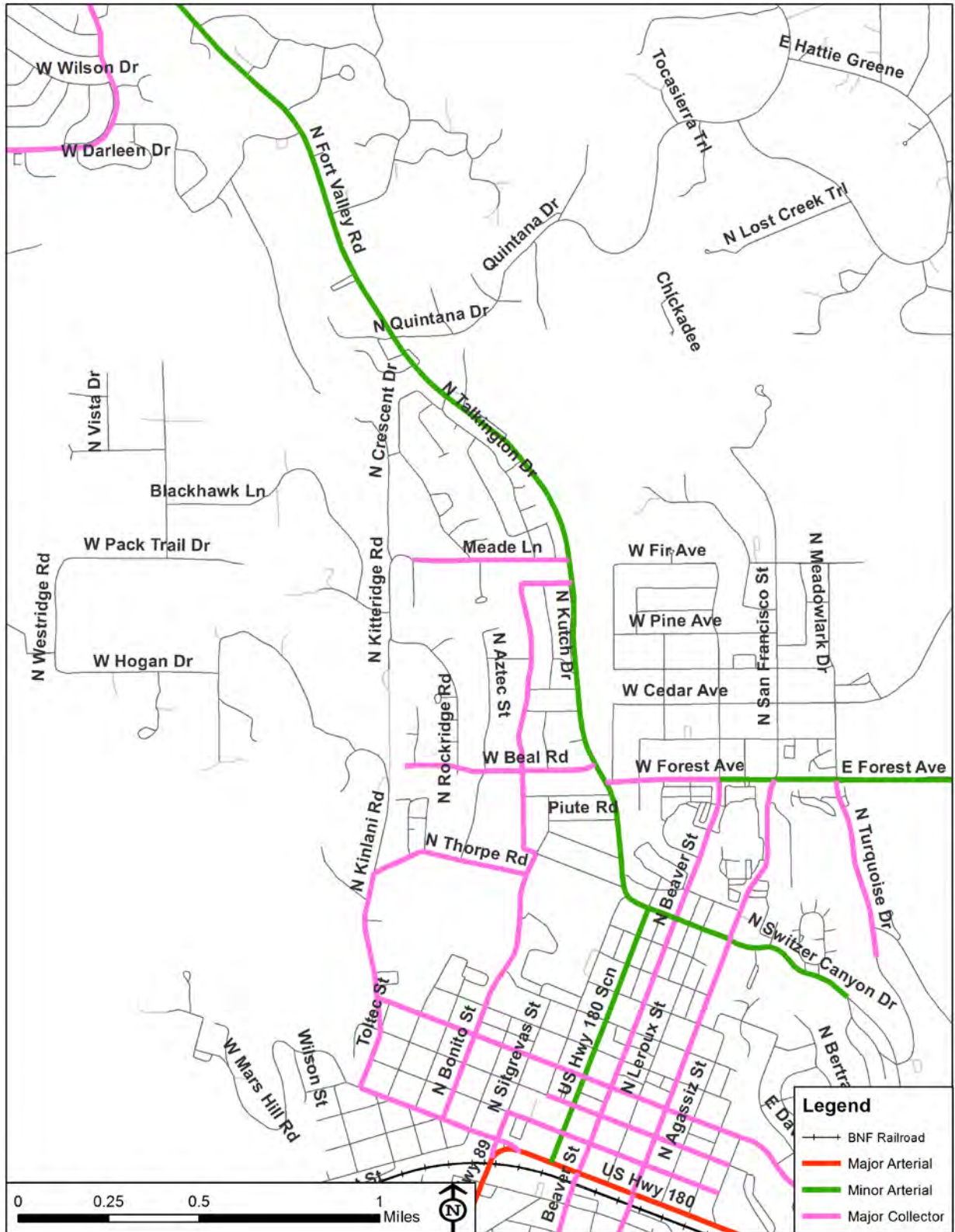


Figure 5-2: FHWA Functional Classification of Roadways (Continued)

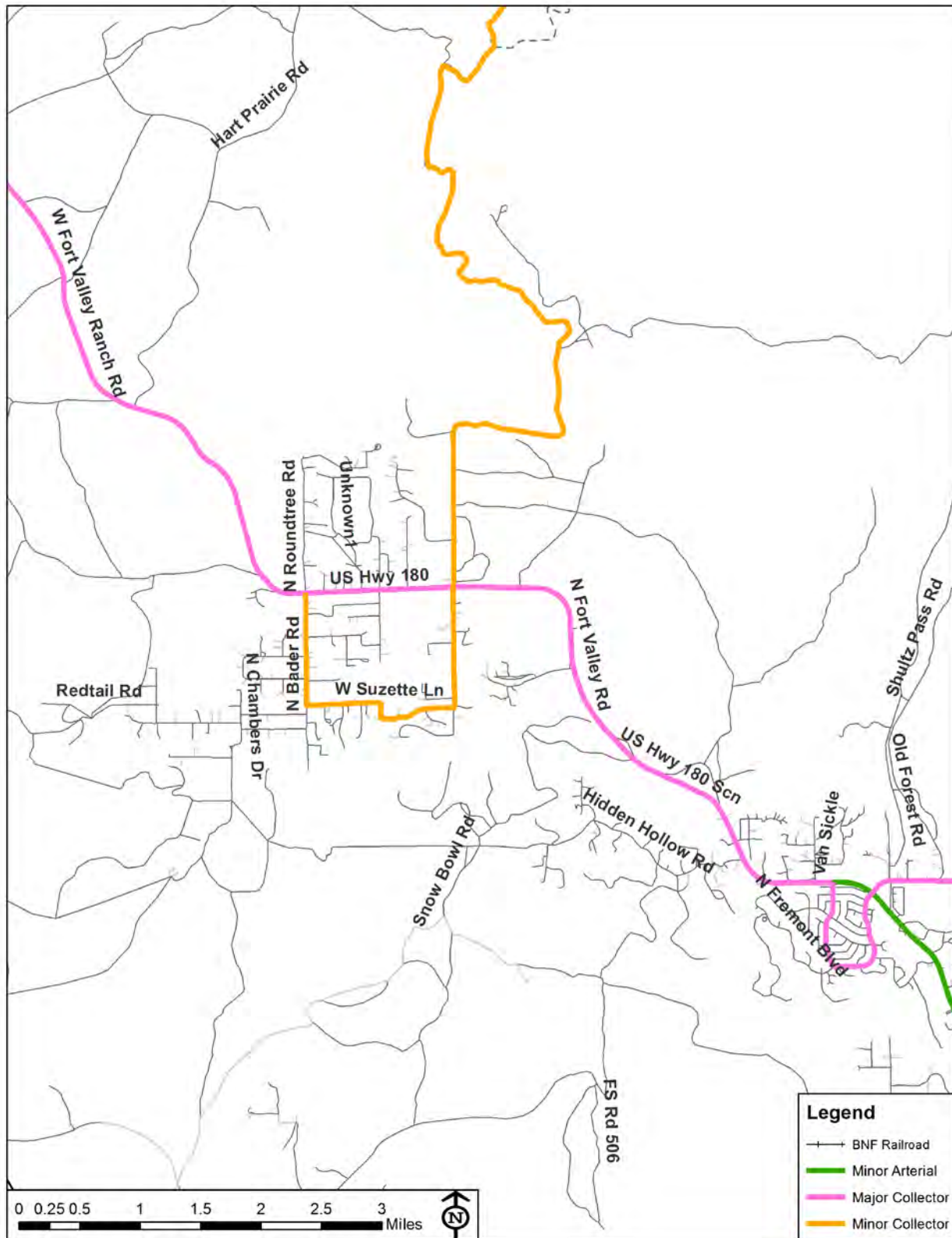


Figure 5-3: Existing 2017 Intersection Control and Lane Geometry

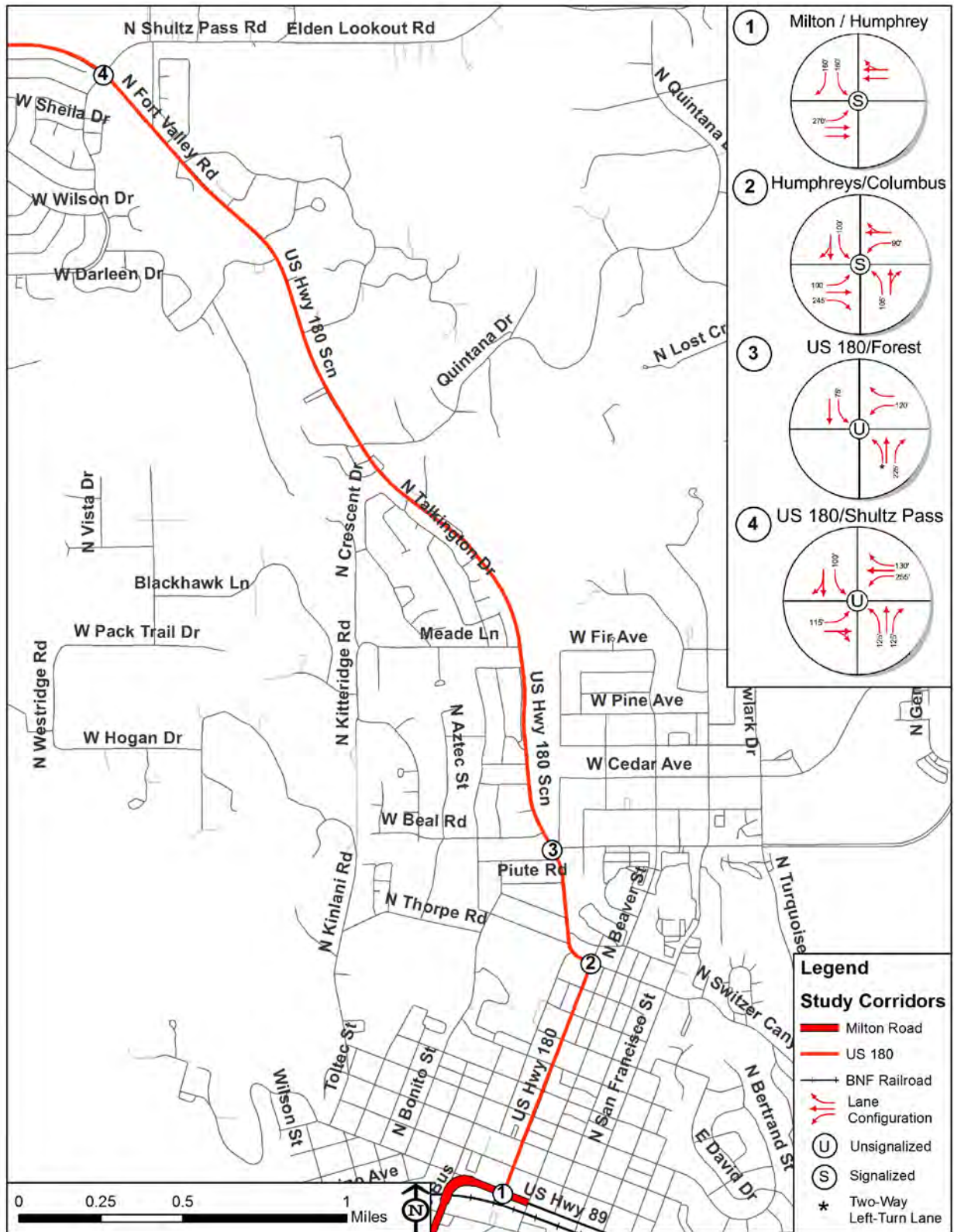


Figure 5-4: Existing Traffic Control at Study Intersections

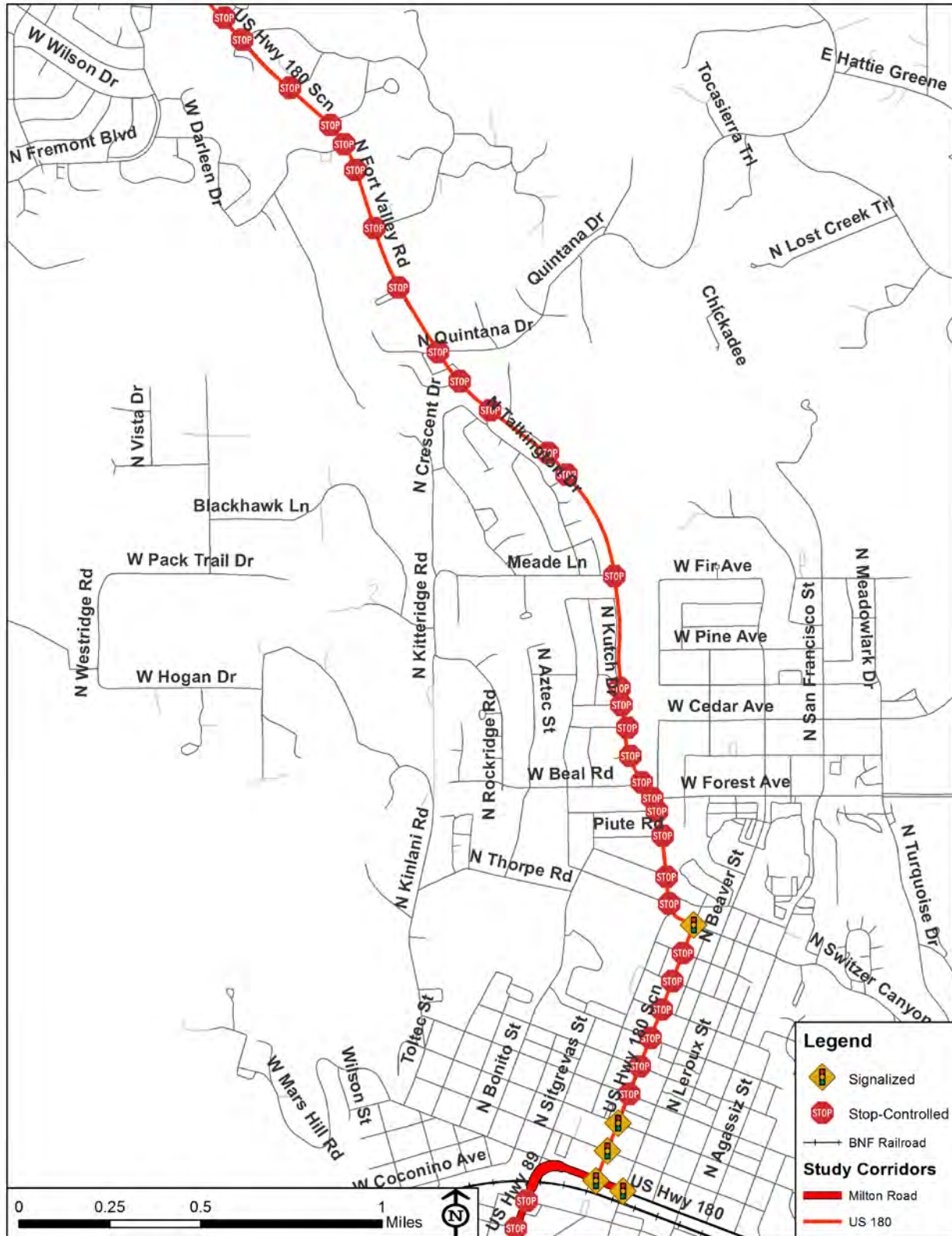
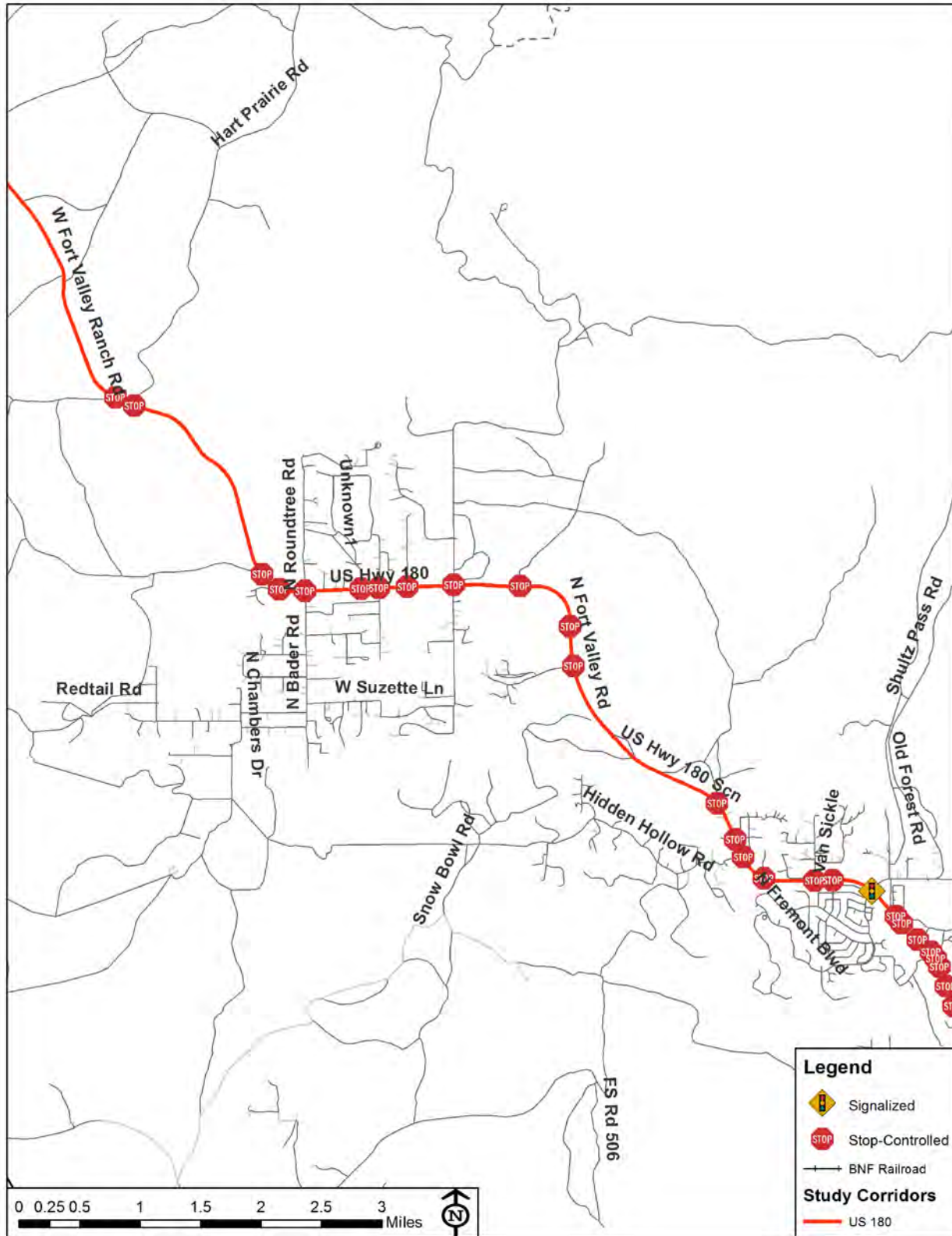


Figure 5-5: Existing Traffic Control at Study Intersections (Continued)





## Existing Travel Conditions, LOS & Congestion

### Historical Traffic Volumes

Historical daily traffic volumes between the years 2011 and 2017 for the US 180 corridor are available on the ADOT Transportation Data Management System (TDMS) website. Historical daily traffic volumes on hourly intervals are also available on the ADOT TDMS website.

### Existing Traffic Volumes

Peak hour turning movement counts were collected in fifteen-minute intervals from 11:00 AM to 1:00 PM and from 4:00 PM to 6:00 PM at various signalized and unsignalized intersections along the study corridor. It is important to note that the study corridor does not have a traditional AM peak hour, but rather a significant Mid-Day peak hour. Therefore, Mid-Day and PM peak hour traffic volumes were collected at intersections along the corridor.

### Existing Roadway Level-of-Service

Traffic congestion levels were estimated for the US 180 study corridor using the existing 24-hour daily traffic volumes. The degree of congestion is expressed in terms of level-of-service (LOS)

### Bicycle & Pedestrian Counts

**Table 5-1** and **Table 5-2** summarizes the number of pedestrians and bicyclists respectively at the study area intersections within the US 180 study corridor during the Mid-Day and PM peak hours.

The highest number of pedestrians crossing US 180 occurred at Columbus Avenue. Pedestrian volume is generally observed to be higher during the PM peak hour at the study area intersections.

The highest number of bicyclists crossing US 180 occurred at Shultz Pass Road. Bicycle volume is observed to be higher during the PM peak hour at the study area intersections.

**Table 5-1: Existing Pedestrian Crossing Volume**

Intersection	North Leg		South Leg		East Leg		West Leg	
	Mid-Day	PM	Mid-Day	PM	Mid-Day	PM	Mid-Day	PM
Humphreys St	6	20	0	0	0	0	0	0
Columbus Ave	0	1	0	4	0	7	24	13
Forest Ave	0	0	1	6	1	7	0	0
Shultz Pass Rd	1	0	0	0	0	0	0	1

**Table 5-2: Existing Bicycle Crossing Volume**

Intersection	North Leg		South Leg		East Leg		West Leg	
	Mid-Day	PM	Mid-Day	PM	Mid-Day	PM	Mid-Day	PM
Humphreys St	2	6	0	0	1	1	0	1
Columbus Ave	0	3	1	6	0	3	3	3
Forest Ave	0	0	0	5	1	7	0	1
Shultz Pass Rd	0	17	1	2	0	8	1	3



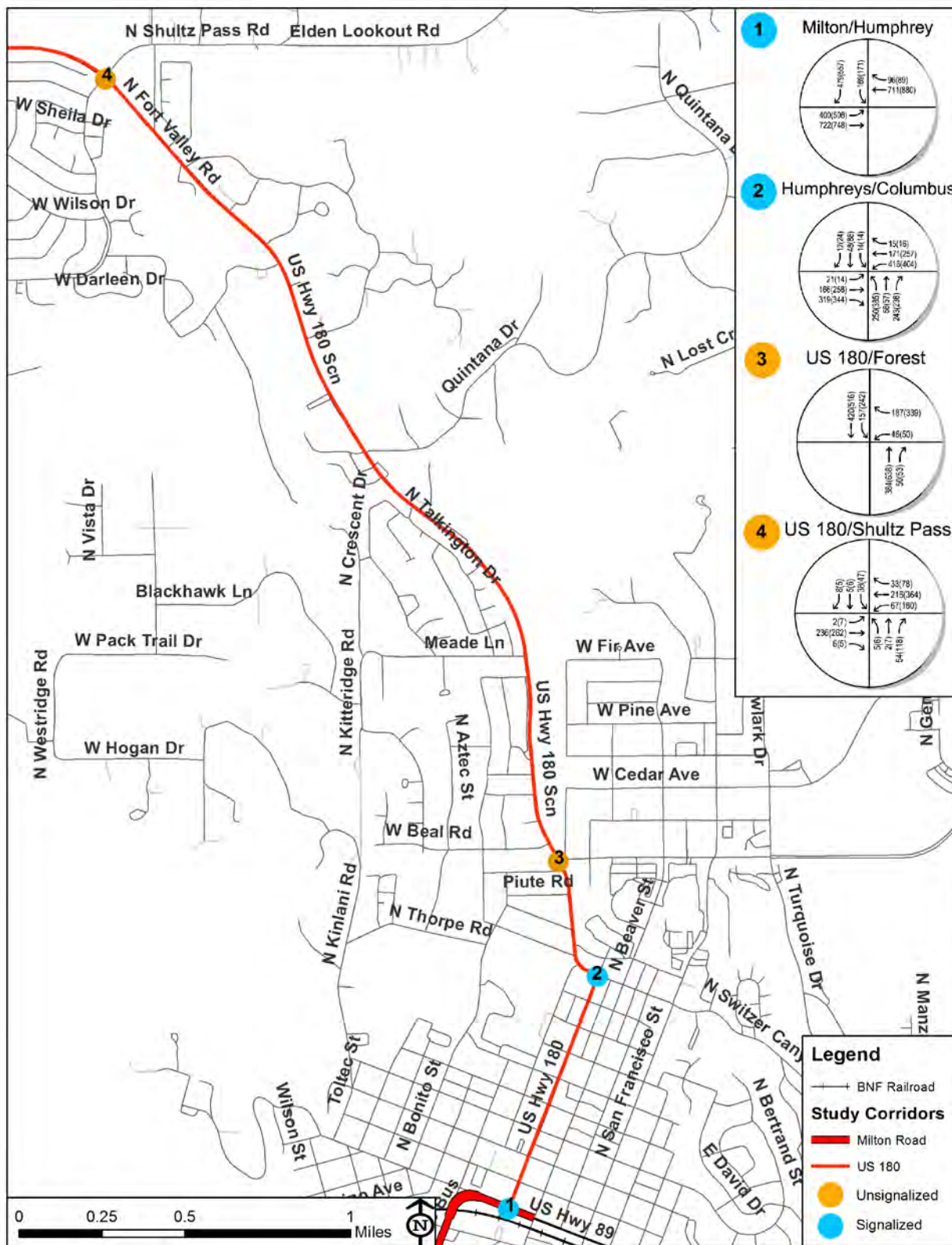
## Existing Intersection Operational Analysis

### Existing Turning Movement Volumes

Peak hour turning movement counts were collected in fifteen-minute intervals from 11:00 AM to 1:00 PM and from 4:00 PM to 6:00 PM at various signalized and unsignalized intersections along the study corridor. It is important to note that the study corridor does not have a traditional AM peak hour, but rather a significant Mid-Day peak hour. Therefore, Mid-Day and PM peak hour traffic volumes were collected at intersections along the corridor. **Figure 5-6** shows the Mid-Day and PM peak hour traffic volumes at various signalized and unsignalized intersections along the study corridor.



Figure 5-6: Existing 2017 Peak Hour Traffic Volumes – (MD) PM Peak Hours




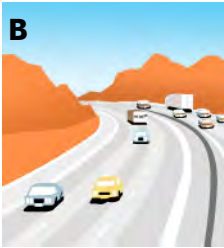




## Existing Intersection Level-of-Service (LOS)

The ability of a transportation system to transmit the transportation demand is characterized as its level of service (LOS). LOS is a rating system from “A”, representing the best operation, to “F”, representing the worst operation. The appropriate reference for LOS operation is the Highway Capacity Manual, published by the Transportation Research Board. This manual characterizes the LOS for an urban street facility as described in **Table 5-3**. Urban Street facilities are described as having interrupted flow (signals, all-way stops, or roundabouts) at a spacing of 2 miles or less. The LOS descriptions below are applicable for arterial and collector streets.

In general, LOS A and B represent no congestion, LOS C and D represent moderate congestion, and LOS E and F represent severe congestion.



**Table 5-3: Level of Service Criteria for Urban Street Facilities**

Level-of-Service	Characterized by <i>Highway Capacity Manual</i> as:
<p><b>A</b></p> 	<p>Primarily free-flow speed. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85 percent of the base free-flow speed.</p>
<p><b>B</b></p> 	<p>Reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 percent and 85 percent of the base free-flow speed.</p>
<p><b>C</b></p> 	<p>Stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 percent and 67 percent of the base-flow speed.</p>
<p><b>D</b></p> 	<p>Less stable condition in which small increases in flow may cause substantial increases in delay and decrease in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40 percent and 50 percent of the base free-flow speed.</p>
<p><b>E</b></p> 	<p>Unstable operation and significant delay. Such operation may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 percent and 40 percent of the base free-flow speed.</p>
<p><b>F</b></p> 	<p>Flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base free-flow speed. Also, LOS F is assigned to the subject direction of travel if the through movement at one or more boundary intersections has a volume-to-capacity ratio greater than 1.0.</p>

LOS can be calculated for roadway segments, intersections, and freeway mainline lanes and ramps. LOS estimates also can be calculated for different periods, including daily conditions and peak hour conditions. The LOS analysis discussed in this section focuses on planning level analysis of study area intersections. LOS based on peak hour turning movement volumes and anticipated delay is discussed in the following section.

The delay and LOS are calculated for the intersection and each approach. **Table 5-4** lists the LOS criteria for signalized and unsignalized intersections as stated in the HCM manual.

**Table 5-4: Level-of-Service Criteria at Signalized and Unsignalized Intersections**

Level-of-Service	Average Control Delay	
	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

As mentioned in the **Existing Turning Movement Volumes** section of this report, 2017 peak hour turning movement counts were collected at the key intersections along the US 180 study corridor. Existing 2017 peak hour turning movement volumes at intersections along the US 180 study corridor are shown in **Figure 5-6**.

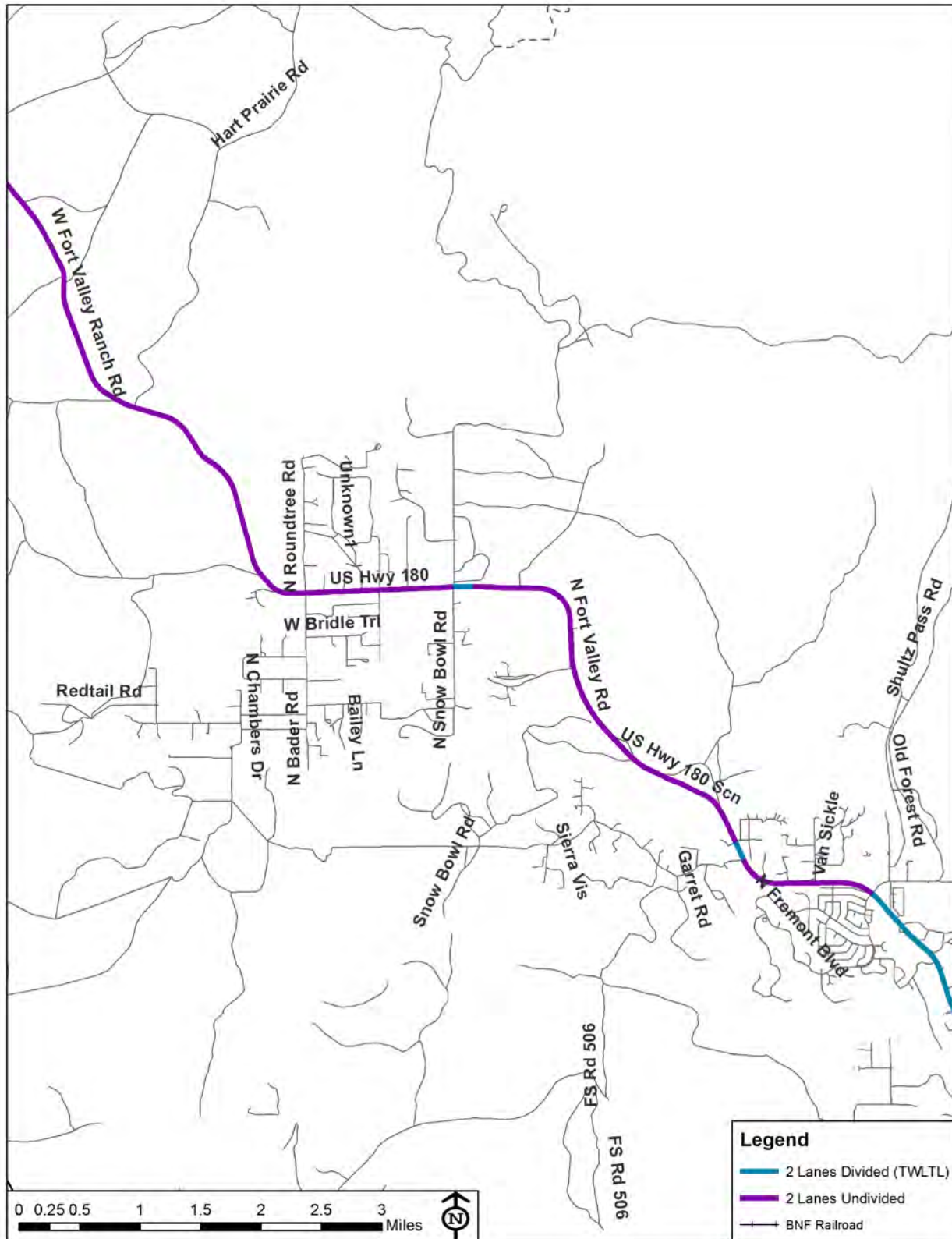
One of the important conditions for determining LOS at an intersection is the number of lanes provided for each movement on each approach at the intersection. **Figure 5-3**, **Figure 5-7** and **Figure 5-8** depict the existing lane configuration and traffic control at the study intersections along the US 180 corridor.

LOS for the study intersections was analyzed using *Synchro 9* software, which utilizes the criteria in **Table 5-4**. The input and output of these analyses are provided as **Appendix XX** to this report. **Table 5-5** presents the existing 2017 LOS summary for the study intersections along the US 180 corridor.





Figure 5-8: Existing 2017 Lane Geometry (Continued)





**Table 5-5: Existing 2017 LOS at Signalized and Unsignalized Intersections**

Intersection	Approach	2017 MD Peak		2017 PM Peak	
		LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)
<b>Milton Rd and Humphreys St</b>	Northbound	-	-	-	-
	Southbound	D	49.3	D	51.3
	Eastbound	A	6.8	C	20.3
	Westbound	B	13.6	C	21.8
	<b>Overall</b>	<b>B</b>	<b>19.6</b>	<b>C</b>	<b>28.5</b>
<b>Humphreys St and Columbus Ave</b>	Northbound	B	15.8	B	19.2
	Southbound	C	25.0	C	32.5
	Eastbound	C	32.4	D	41.2
	Westbound	C	29.6	D	45.8
	<b>Overall</b>	<b>C</b>	<b>25.8</b>	<b>D</b>	<b>35.0</b>
<b>US 180 and Forest Ave</b>	Northbound	A	0.0	A	0.0
	Southbound	A	2.3	A	3.2
	Eastbound	-	-	-	-
	Westbound	B	13.2	D	29.7
	<b>Overall</b>	<b>A*</b>	<b>3.6</b>	<b>A*</b>	<b>7.6</b>
<b>US 180 and Shultz Pass Rd</b>	Northbound	B	19.9	C	20.3
	Southbound	C	20.1	C	20.2
	Eastbound	A	6.5	A	6.6
	Westbound	A	6.1	A	7.2
	<b>Overall</b>	<b>A</b>	<b>8.5</b>	<b>A</b>	<b>9.3</b>

\*Synchro output did not include HCM LOS. LOS reported is based on the Average Delay

The signalized and unsignalized study area intersections operate at LOS “D” or better with the existing 2017 traffic volumes, existing lane geometrics and existing signal timing. All the approaches operate at LOS “D” or better with the exception of the southbound approach at the intersection of Milton Road and Humphreys Street, which operates at LOS “E” during the PM peak hour.



## Existing Non-Motorized Mobility

### Existing Bike Facilities

Bicycle lanes does not exist on Humphreys Street between Milton Road and Columbus Avenue. Bicycle lanes exist on both sides of US 180 between Humphreys Street and Snow Bowl Road. There are no existing bike lane roadway marking or signs posted in association with the existing bike lanes with the exception of the “Begin Right Turn Lane Yield to Bikes” signs at right-turn lanes between Sechrist Elementary School and Valley Crest Street. The FUTS Trail does exist along the south side of US 180 from Navajo Drive to Stevanna Way where it crosses the US 180 roadway and continues north.

### Existing Pedestrian Facilities

Continuous sidewalks exist on both sides of Humphreys Street between Milton Road and Columbus Avenue. Between Humphreys Street and Shultz Pass Road, sidewalk exists on both sides of US 180 along the developments frontage, with an exception of a sidewalk gap south of Sechrist Elementary school on the north side of US 180. On the other hand, there is Sidewalk does not exist on either side of US 180 between Shultz Pass Road and the northern terminus of the corridor (MP 233.25).

### Existing Transit Services

The Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA) is the transit agency in Northern Arizona operating Mountain Line, Mountain Lift and Mountain Link systems in Flagstaff.

Mountain Line and Mountain Lift services are available along the US 180 study corridor. Bus service is not available on Humphreys Street between Aspen Avenue and Columbus Avenue and on US 180 between Navajo Drive and Forest Avenue. Mountain Line Route 5 runs on Humphreys Street between Milton Road and Aspen Avenue, on US 180 between Humphreys Street and Navajo Drive and between Forest Avenue and Peak View Road. Bus stops for Route 5 of Mountain Line are located at the following locations along the US 180 study corridor:

- North of Forest Avenue – northbound direction,
- South of Whipple Road – southbound direction,
- North of Meade Lane – northbound direction
- South of Meade Lane – southbound direction,
- South of Louise Drive – northbound direction,
- North of Stevanna Way – southbound direction,
- North of Blue Willow Road – northbound direction,
- South of Valley Crest Street – northbound direction, and
- South of Research Center Drive – southbound direction.

The bus stop located south of Valley Crest Street have covered structure to accommodate sitting pedestrians and provide shading structures.

Mountain Lift is a shared-ride program, which is an origin to destination, demand-responsive paratransit service that mirrors Mountain Line fixed-route service in terms of service times and areas. Mountain Lift service is available to people with disabilities who do not have the functional ability to ride fixed-route buses, either permanently or under certain conditions. US 180 between Hidden Hollow Road and Forest Avenue falls within the Mountain Lift service area.



## Access Management Guidelines

Access management is defined as the process or development of a program intended to ensure that major arterials, intersections and freeway systems serving a community or region will operate safely and efficiently while adequately meeting the access needs of the abutting land uses along the roadway. Effective access management programs control the location, spacing, design, and operation of driveways, median openings and intersections to reduce the number of vehicular conflict points.

Driveway and access management guidelines for ADOT and City of Flagstaff are summarized below:

### ADOT

A summary of the ADOT Traffic Engineering Guidelines and Procedures (TGP) Section 1060 – Median Openings for urban areas is shown below:

1. All median openings shall be designed to include median storage lanes for both directions of travel.
2. Spacing between median openings at intersections shall not be less than 330 feet.
3. In urban areas, median openings between intersections may be established for public safety and convenience if the opening is not closer than 660 feet to an intersection with an improved public street or another median opening.
4. Median openings may be established for business generating relatively high traffic volumes, provided that:
  - a. The minimum left-turn traffic volume is 500 vehicles per day or 100 vehicles during the peak hour in urban areas where the major street speed limit is less than 40 miles per hour.
  - b. The minimum left-turn traffic volume is 350 vehicles per day or 70 vehicles during the peak hour in urban areas where the major street posted speed limit is 40 mph or greater.
  - c. The distance to the nearest adjacent median opening is not less than 330 feet.

### City of Flagstaff

A summary of the City of Flagstaff access management guidelines, included in Engineering Design Standards and Specifications for New Infrastructure Section 13-10-006-0001 are as follows:

1. Distances between centerlines of adjacent intersections shall be a minimum of 135 feet, regardless of the direction of the intersection streets.
2. The minimum spacing of driveways to signalized and unsignalized intersections shall be in accordance to **Table 5-6** below:



**Table 5-6: Minimum Spacing of Driveways to Intersections per City of Flagstaff**

Posted Speed (mph)	Spacing	
	Signalized	Unsignalized
≤ 30	230	-
30	-	115
35	275	135
40	320	155
45	365	180

### Current Access

Each access point along the study corridor was identified through a review of aerial mapping. All the driveways and intersections along the US 180 study corridor are full access. Full access driveways and intersections generally allow all traffic movements on all approaches. These intersections are either STOP controlled on both the side streets or traffic signal controlled.

**Figure 5-9** and **Figure 5-10** illustrate the locations of existing driveways and intersections along the study corridor. The US 180 corridor has a large number of driveways along the corridor, particularly concentrated along the Humphrey’s Street segment. Humphreys Street has a two-way left-turn lane between Milton Road and Columbus Avenue. US 180 has a two-way left-turn lane between Humphreys Street and Shultz Pass Road. Due to the absence of the raised median along the corridor, access control at existing driveways and intersections is limited.



Figure 5-9: Existing Access Points

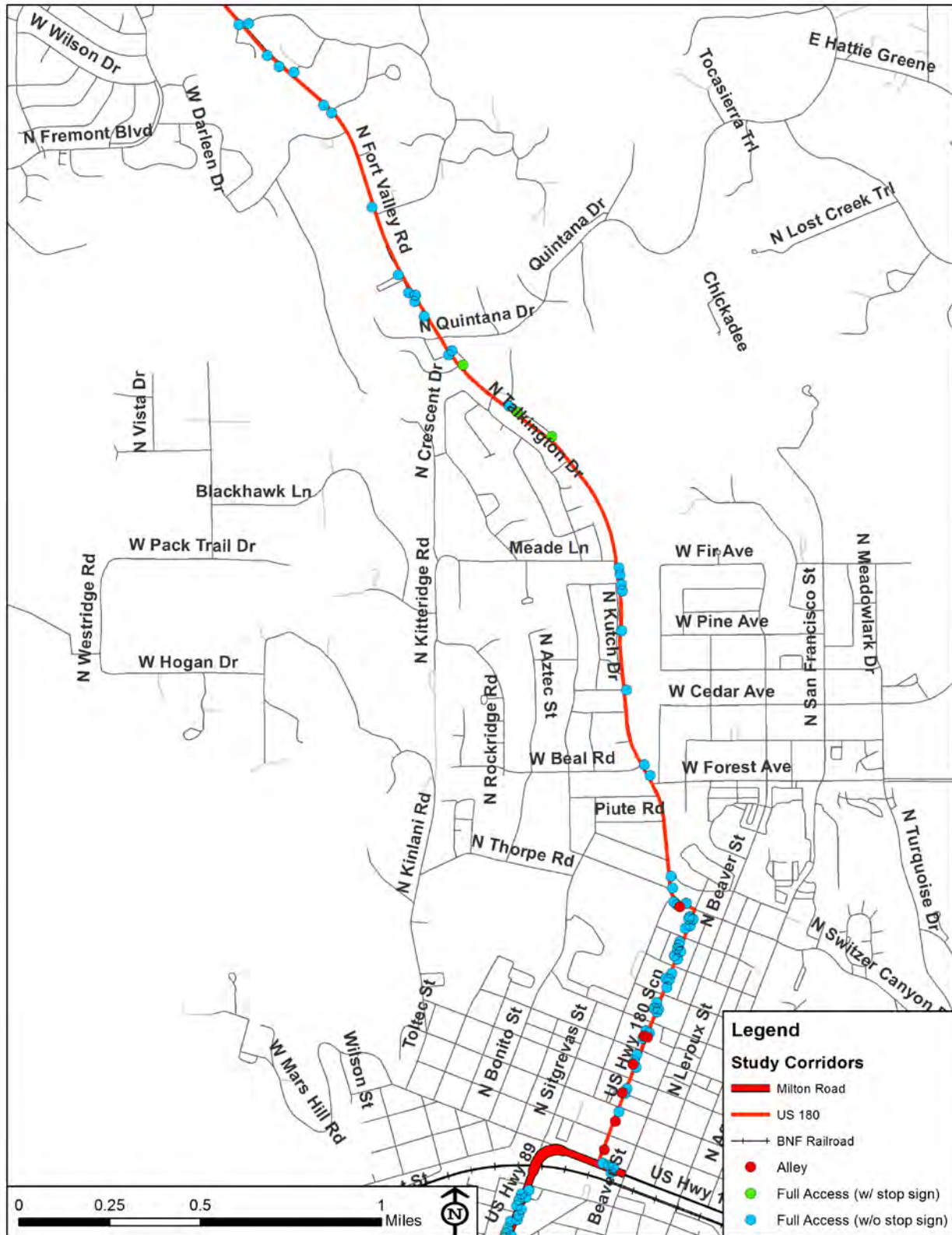
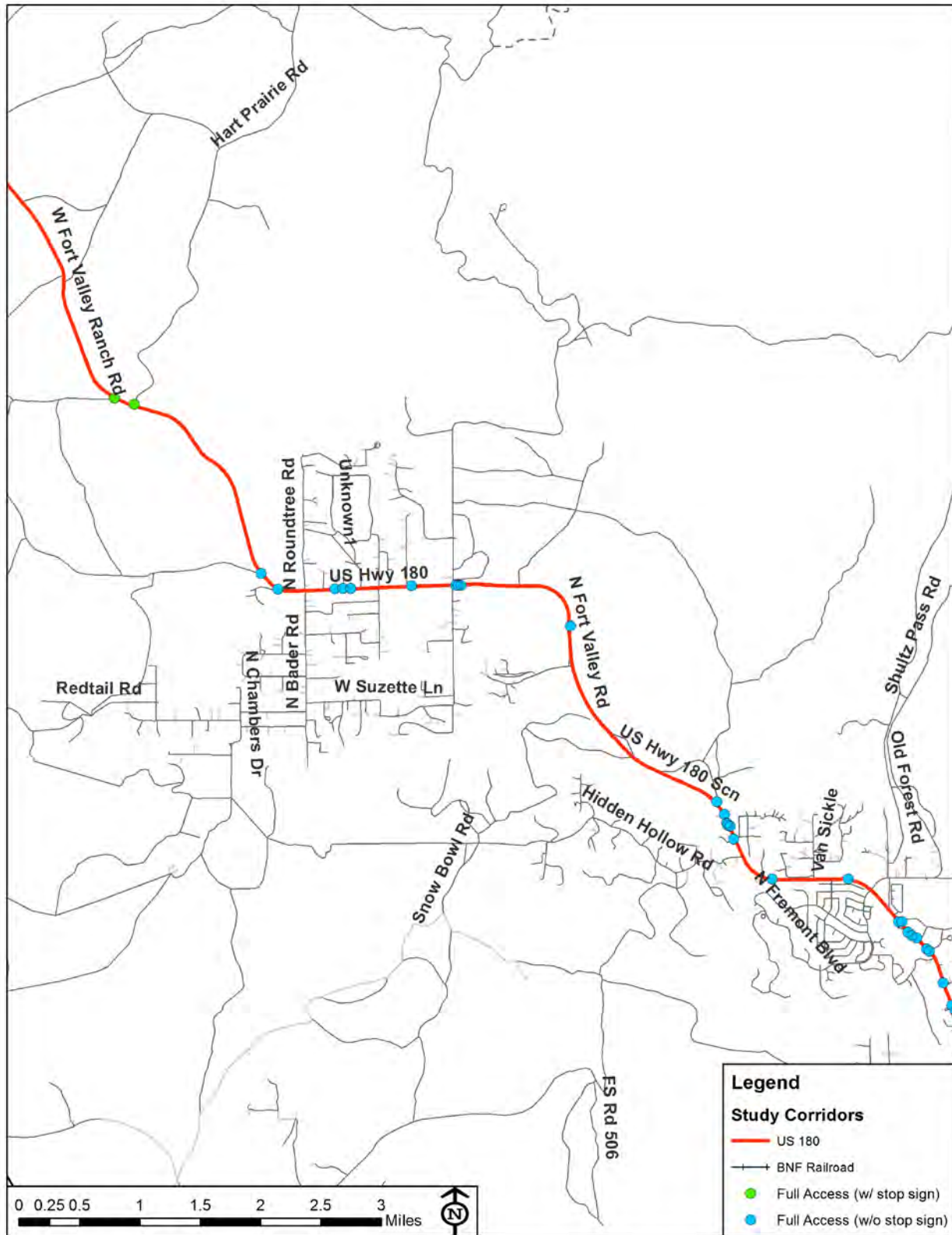


Figure 5-10: Existing Access Points (Continued)



## Existing Pavement Conditions

The pavement surface for the entire corridor is asphaltic concrete. Pavement condition data was obtained from the street view of Google Earth and cursory field review of the US 180 corridor. Roadway conditions at the time of the Google Earth review were defined as:

**Good Condition:** Like new pavement with few defects as perceived by field reviewers, no sign of cracking and pavement deterioration, no maintenance is required as cracks are barely visible or well-sealed.

**Fair Condition:** Slight rutting, and/or cracking, and/or roughness that became noticeable by field reviewers. The road may also be bumpy but not enough to reduce vehicle speed, and may have some pavement raveling.

**Poor Condition:** Multiple cracks, potholes, roughness, and/or bleeding are apparent on roadway. Roadway may be uncomfortable to vehicle occupants and drivers may need to correct or avoid road defects. Previous road repairs are deteriorated and require maintenance.

Based on the Google Earth and cursory field review, Humphreys Street between Milton Road and US 180 and US 180 between Humphreys Street and Shultz Pass Road appears to be in a good condition with minor longitudinal cracking. Between Shultz Pass Road and Roundtree Road, US 180 appears to be in a good condition with no notable pavement deformations. Between Roundtree Road and the Wing Mountain Snow Play Area, US 180 is experiencing minor longitudinal and traverse cracking and appears to be in a good condition through the corridor.



**CHAPTER 6: EXISTING CORRIDOR SAFETY CONSIDERATIONS**

A crash analysis was conducted for the study corridor to identify trends, patterns, predominant crash types, and high crash intersections. The purpose of the crash analysis is to discover safety hazard locations that need to be addressed to improve area safety. Crash data for the five-year period from January 1, 2012 to December 31, 2016 was obtained from the Arizona Department of Transportation Traffic Records Section.

**Vehicular Crash Data Analysis (5 years)**

Crash data for the five-year period from January 1, 2012 to December 31, 2016 was obtained from the Arizona Department of Transportation Traffic Records Section. Within the five-year analysis period, 575 crashes occurred within the US 180 study corridor.

**Injury Severity**

There were seven fatalities reported in the analysis period within the study area, two each in the years 2012, 2014 and 2016, and one in the years 2013. 146 of 575 crashes (25%) within the study corridor resulted in an injury crash, which is less than the statewide average injury crash percentage for the year 2012 to 2016 (31%). A comparison of total crashes number of crashes that occurred within the five-year period for the US 180 study corridor and the Statewide average is shown in **Table 6-1**.

**Table 6-1: Crash Severity Comparison**

Crash Severity	Number	US 180 %	Statewide Average %*
Fatal	7	0.12%	1%
Injury	146	25%	31%
Property Damage Only	422	75%	68%

*\*Average of all crashes from 2012-2016*

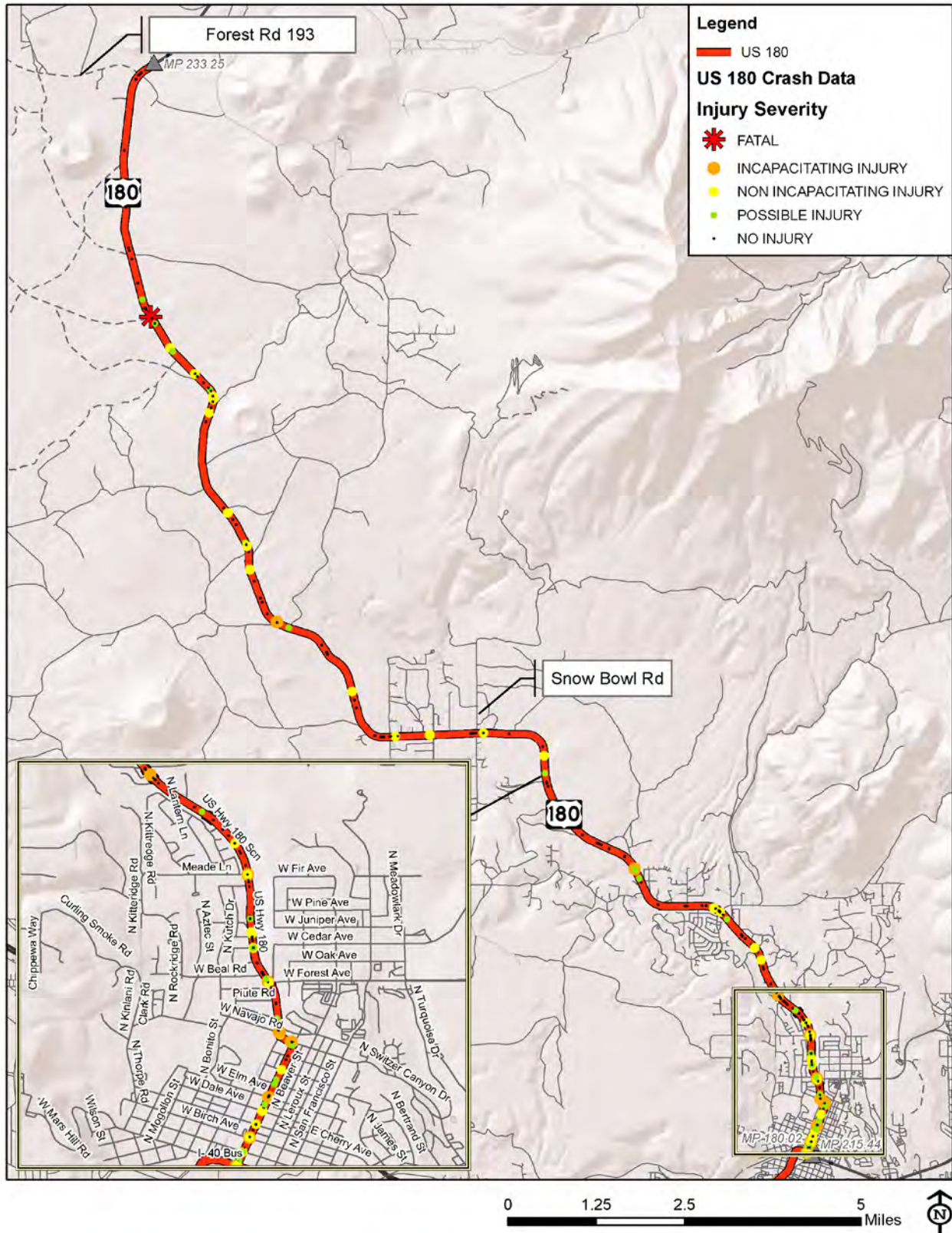
**Figure 6-1** shows the location of crashes along US 180 on a map and categorizing them by the severity of the injury. There is the highest concentration of crashes on Humphrey’s Street between Route 66 and Columbus Avenue.

**Figure 6-2** illustrates the percentage of crashes that occurred along the corridor during the five-year analysis period based in the severity of crashes

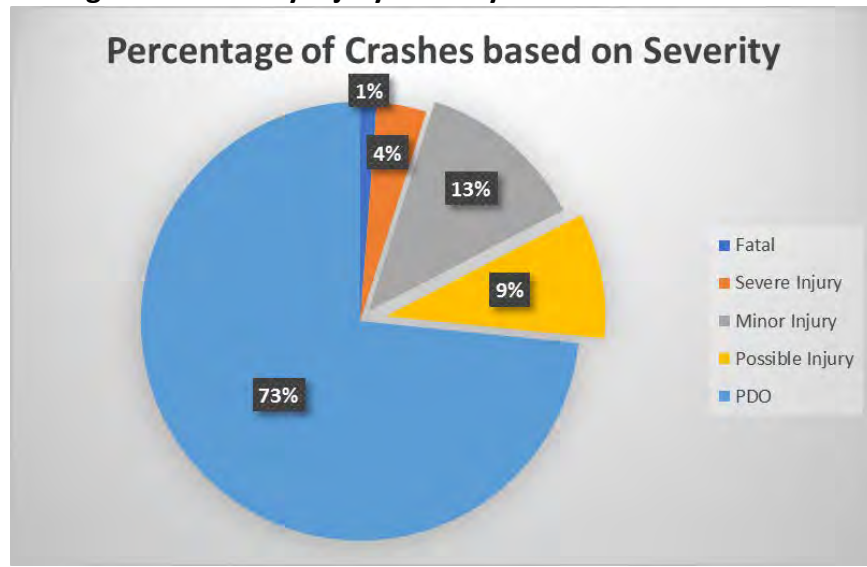




Figure 6-1: US 180 Crashes by Injury Severity



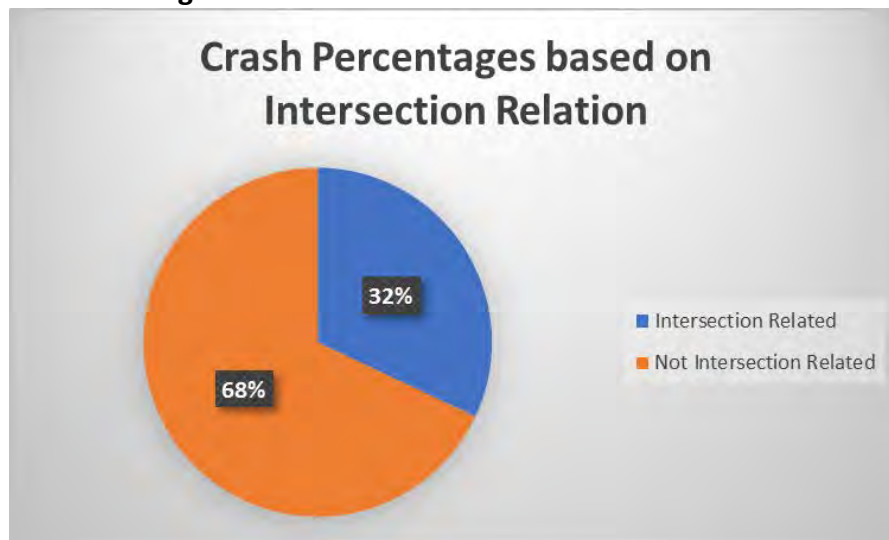
**Figure 6-2: Percentage of Crashes by Injury Severity**



### Intersection Relation

As shown in **Figure 6-3**, 32% of the total crashes within the five-year analysis period occurred at intersections. For the purposes of this analysis, intersection and non-intersection related crashes were based on the “Junction Relation” column included in the crash data excel files.

**Figure 6-3: Crash Percentages based on Intersection Relation**



**Table 6-2** depicts a summary of the intersection related crashes along the US 180 study corridor.

**Table 6-2: Summary of Intersection Crashes**

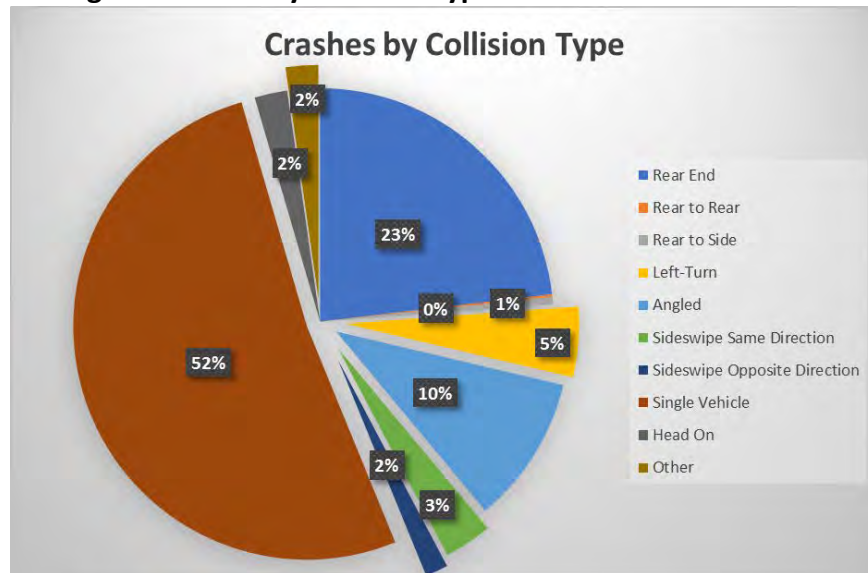
Intersection		Humphreys St	Columbus	Forest Rd	Shultz Pass Rd	
<b>Total Crashes</b>		<b>77</b>	<b>14</b>	<b>21</b>	<b>5</b>	
<b>Severity</b>	Fatality	1	0	0	0	
	Severe Injury	3	1	1	0	
	Minor Injury	2	1	5	1	
	Possible Injury	17	1	1	0	
	PDO	54	11	14	4	
<b>Type of Collision</b>	Angle	5	4	7	1	
	Head On	2	2	1	1	
	Sideswipe	9	0	3	0	
	Left-Turn	9	0	3	0	
	Rear End	38	8	5	2	
	Rear to Rear	0	0	0	0	
	Rear to Side	0	0	0	0	
	Pedestrian	1	0	0	0	
	Bike	6	0	1	0	
	Single Vehicle	4	0	1	1	
	Other/Unknown	2	0	0	0	
	<b>Light Conditions</b>	Daylight	66	14	17	4
		Dawn	3	0	0	0
Dusk		3	0	1	0	
Dark Lighted		4	0	2	0	
Dark not Lighted		1	0	1	1	

### Collision Manner

**Figure 6-4** illustrates the percentage of crashes that occurred along the corridor during the five-year study period by collision type. As shown in the Figure, 52% of the total crashes during the five-year analysis period were single vehicle collisions, 23% were rear end and 10% were angled. 93% of the reported single vehicle collisions occurred at locations other than intersections, the remaining 7% occurred at intersections. 53% of the reported rear end collisions were non-intersection related crashes, the remaining of the 47% were intersection related crashes.



**Figure 6-4: Percentage of Crashes by Collision Type**



**Crashes by Year**

**Figure 6-5** illustrates the total number of crashes that occurred along the corridor during the five-year study period in each year. As shown in the Figure, the corridor experiences the highest number of crashes in the year 2015 (with total 130 crashes).

**Figure 6-5: Total Crashes by Year**

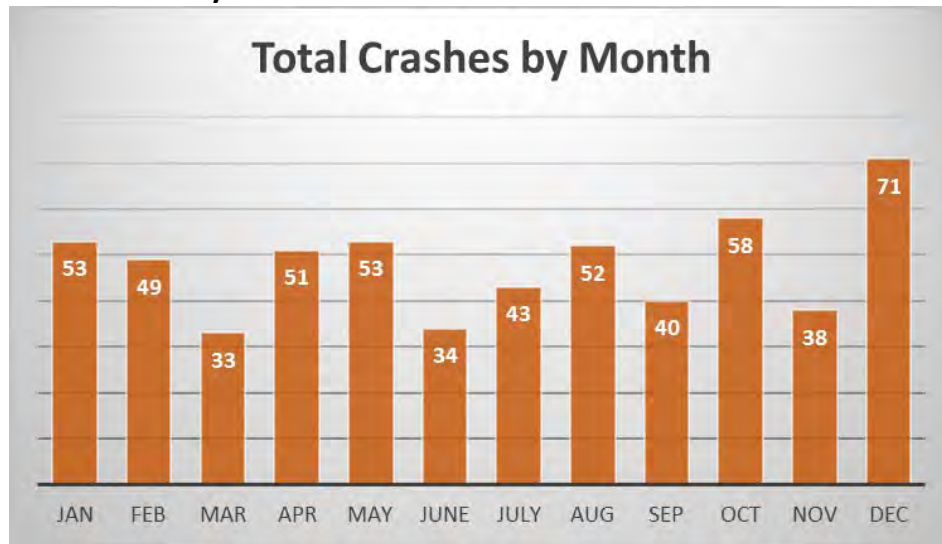


**Crashes by the Time of the Year**

illustrates the total number of crashes that occurred along the corridor during the five-year analysis period by month. As shown in **Figure 6-6**, highest number of crashes occurred in the month of December.



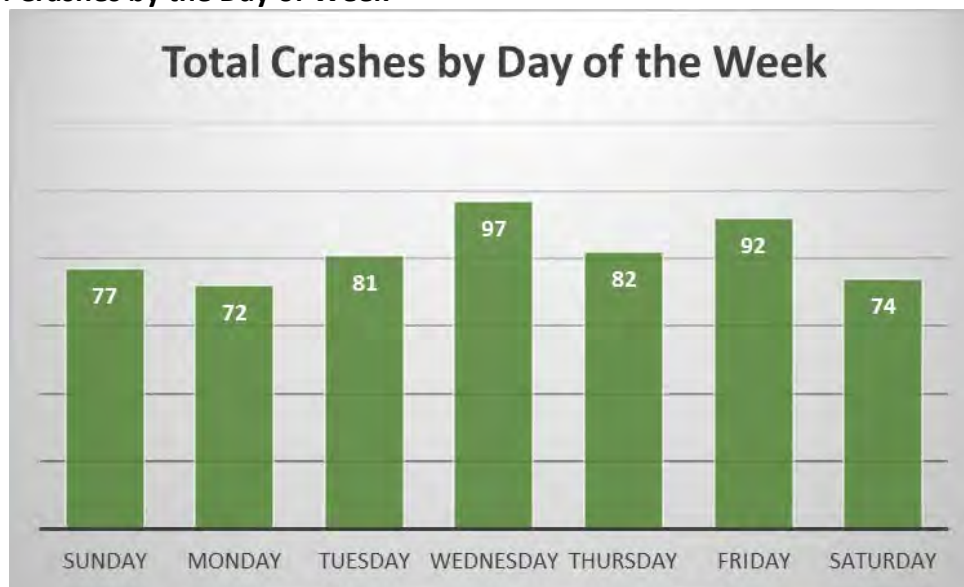
**Figure 6-6: Total Crashes by Month**



**Crashes by the Day of the Week**

**Figure 6-7** illustrates the total number of crashes that occurred along the corridor during the five-year analysis period by the day of the week. As shown in the Figure, the majority of crashes occurred during weekday, the highest number of crashes occurring on Wednesdays.

**Figure 6-7: Crashes by the Day of Week**

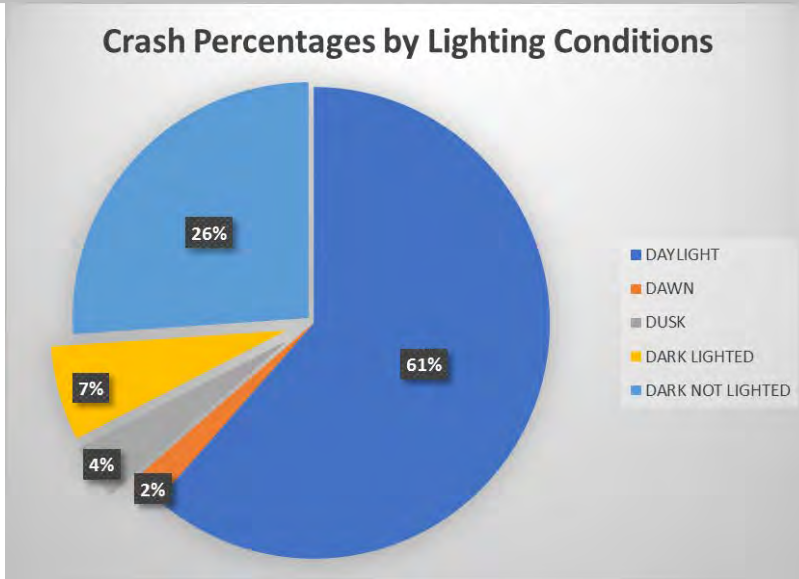


**Lighting Conditions**

**Figure 6-8** illustrates the total crashes percentages that occurred along the corridor during the five-year analysis period based on the lighting conditions of the study area. As shown in the Figure, 61% of the total crashes occurred during daylight and 26% of the crashes occurred during dark conditions with no lighting.

**Figure 6-8: Crash Percentages by Lighting Conditions**

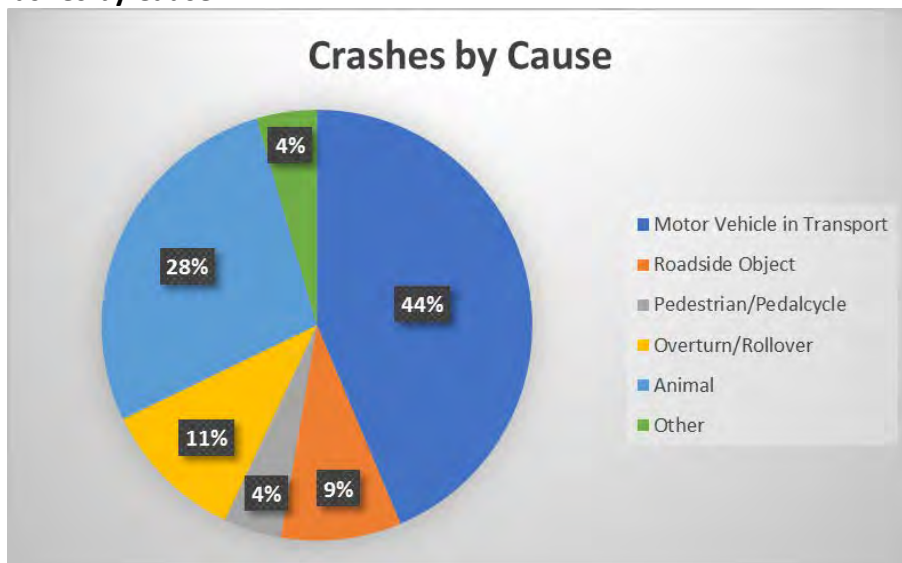




**Crashes by Cause (change pie chart to numbers from %)**

Analyzing the crash events assists in identifying hazards that cause safety issues along study roadways. **Figure 6-9** illustrates the total number of crashes that occurred along the corridor during the five-year analysis period based on the reason for the collision. Based on five-year crash data on the US 180 study corridor, 251 of the total 575 crashes were caused due to a motor vehicle in transport. Of the remaining 325 crashes, 56 were due a roadside object, 25 were pedestrian/pedal cycle related, 63 were due to overturn/rollover and 159 were caused due to an animal. The number of crashes caused by an animal is higher than other similar corridors and needs further investigation. Parked vehicle, ditch/embankment related crashes and other crashes were minimal along the study corridor.

**Figure 6-9: Crashes by Cause**

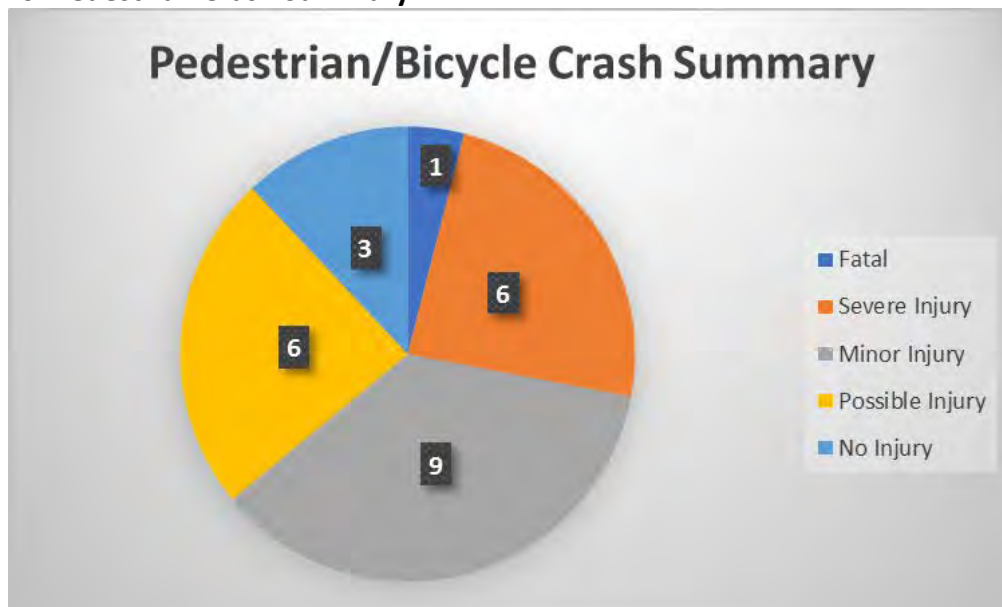


## Pedestrian/Bicycle Crash Data Analysis

As mentioned in the *Crashes by Cause* section of the report, 25 of the total 575 crashes were pedestrian/pedal cycle related collisions. **Figure 6-10** illustrates the total number of pedestrian/pedal cycle crashes that occurred along the corridor during the five-year analysis period.

One of the 26 pedestrian/pedal cycle related crash resulted in fatality in the year 2014. This fatality was caused when a driver on a motor vehicle was trying to overtake a pedal cyclist. This fatality occurred during wet and day light conditions. Speed too fast for the conditions was reported as a factor resulting in the fatality. Of the remaining pedestrian / pedal cycle related crashes, 3 were no injury crashes and 21 were injury crashes.

**Figure 6-10: Pedestrian Crash Summary**



## Mid-Block Crossings

Crosswalks along the US 180 study corridor exist at all the signalized intersections and many of the unsignalized intersections. There is one existing mid-block crossing along the US 180 study corridor located at Sechrist Elementary School. The following unsignalized intersections feature at least one crosswalk:

- US 180/Humphreys Street and Cherry Avenue (north leg)
- US 180/Fort Valley Road and Navajo Road (west leg)
- US 180/Fort Valley Road and Apache Road (west leg)
- US 180/Fort Valley Road and Piute Road (west leg)
- US 180/Fort Valley Road and Havasupai Road (west leg)
- US 180/Fort Valley Road and Forest Avenue (south and east legs)
- US 180/Fort Valley Road and Beal Road (west leg)
- US 180/Fort Valley Road and Deanna Way (west leg)
- US 180/Fort Valley Road and Whipple Road (west leg)
- US 180/Fort Valley Road and Whiting Road (west leg)



- US 180/Fort Valley Road and Anderson Road (west leg)
- US 180/Fort Valley Road and Meade Lane (west leg)
- US 180/Fort Valley Road and N Louise (west leg)
- US 180/Fort Valley Road and Quintana Drive (east leg)
- US 180/Fort Valley Road and Creekside Drive (west and east legs)
- US 180/Fort Valley Road and Colton Court (west leg)
- US 180/Fort Valley Road and Blue Willow Road (west leg)





**CHAPTER 7: FUTURE TRAFFIC CONDITIONS**

**Projected Traffic Conditions & Congestion**

The primary purpose of forecasting future traffic volumes is to estimate the additional travel demand added to existing roadways and to forecast congestion levels due to projected growth in population and employment. The following section presents the corridor intersection traffic volumes and levels of congestion, if no roadway improvements are made (*No-Build Condition*). It should be noted that the Project Partners are continuing to analyze and refine future traffic condition modeling parameters. To supplement the analysis and findings described in this chapter, additional future traffic projections will be provided from the Flagstaff Metropolitan Planning Organization (FMPO). This supplemental modeling methodology, analysis and results will be described in Working Paper #2.

**Roadway Network**

Existing intersection control and lane geometry was also used for the design year analysis for the intersections along the US 180 study corridor.

**Design Year 2040 Traffic Volumes**

*Growth Rate*

Historical average daily traffic volume information at various locations along the US 180 study corridor were obtained from the ADOT Transportation Data Management System (TDMS) website. The historical daily traffic volumes obtained from the ADOT TDMS website were used to calculate the growth rate within the study area. **Table 7-1** shows the growth rate calculations for the study area.

**Table 7-1: Growth Rate Calculations**

Year	ADT	Yearly Growth %	Average Growth %
<b>Humphreys, S of Columbus</b>			<b>1.35%</b>
2011	13,878		
		1.33%	
2016	14,825		
<b>Fort Valley, S of Forest</b>			
2012	13,364		
		1.11%	
2017	14,123		
<b>US 180, N of Quintana Dr</b>			
2011	12,238		
		1.31%	
2016	13,064		
<b>US 180, S of Ft Valley Ranch Road</b>			
2011	4,295		
		1.64%	
2016	4,659		

Based on the historical daily traffic volumes obtained from the ADOT TDMS website, the average exponential growth rate was calculated to be 1.35% along the US 180 study corridor. A conservative 1.5% exponential growth rate has been applied to the 2017 traffic volumes to calculate the 2040 traffic volumes.



## Peak Seasonal Traffic Volumes

Existing 2017 traffic volumes at intersections along US 180 were collected on September 12, 2017. Arizona Snowbowl Ski Resort, Wing Mountain Snow Play Area, Crowley Pit Snow Play Area and various other informal snow play areas exist along US 180. Due to these various winter visitor destinations, traffic volumes along US 180 are expected to be higher during the snow season than the September 2017 traffic volumes. Continuous traffic counters data is available for the year 2015 and 2016 on the ADOT TDMS website for US 180 south of Forest Avenue. Upon reviewing the traffic patterns at the continuous traffic counts station on US 180 south of Forest Avenue, it was determined that the traffic volumes during the winter season were generally higher when the Arizona Snowbowl Ski Resort, Arizona Nordic Village, and Crowley Pit Snow Play Area were open for business.

**Table 7-2** shows historical the week of September weekday traffic volumes, peak season traffic volumes and the difference in between the peak season and September traffic volumes on US 180.

**Table 7-2: Seasonal Traffic Volumes and Adjustment Factors**

Year	September Volume	Peak Season		Difference in Volume
		Date	Volume	
2015-2016	13,822	1/2/16	19,731	5,909
2016-2017	13,676	1/14/17	18,037	4,361

As shown in **Table 7-2**, in the 2015-2016 snow season, there were 5,909 more peak seasonal daily traffic volumes than the September traffic volumes. In the 2016-2017 snow season, there were 4,361 more peak seasonal daily traffic volumes than the September traffic volumes. To be conservative, for the purposes of this analysis, the 2015-2016 winter season volumes were used for the analysis. The 2015-2016 peak winter season daily traffic volumes were approximately 5,900 vehicles more than the September traffic volumes.

The ADOT TDMS website also includes the hourly directional traffic volumes at the counting locations. For the peak directional hourly volumes for September 2015 and January 2016. **Table 7-3** shows the direction hourly volume for September 2015 and January 2016, and the difference in the volume.

**Table 7-3: Peak Directional Hourly Volumes**

Month	Northbound		Southbound	
	MD	PM	MD	PM
September	436	743	456	539
January	1,190	515	712	968
<b>Difference</b>	<b>754</b>	<b>-228</b>	<b>256</b>	<b>429</b>

For the purposes of this analysis, the peak snow seasonal traffic is expected to only impact the north-south through traffic on US 180. As shown in **Table 7-3**, the peak directional traffic volumes were higher in the winter peak season during the Mid-day and PM peak hours with the exception of the PM peak hour volumes in the northbound direction. The northbound traffic volume is higher in the off-peak season than the peak winter season. As shown in **Table 7-3**, the snow traffic on US 180 is expected to be as follows:

- Northbound – 754 during the Mid-day peak hour, and
- Southbound – 256 during the Mid-day peak hour and 429 during the PM peak hour.



The northbound traffic volumes during the PM peak hour are higher in the month of September than the winter peak season volumes. Therefore, the September northbound PM peak hour traffic volume shall be used for the analysis.

Changes to the existing snow play areas or the Snowbowl Ski Resort, or developing new snow play areas along US 180 is not known at this time. However, a minimal 0.5% growth factor is expected to be appropriate for the snow traffic along US 180. Therefore, a 0.5% growth factor is applied to the snow traffic on US 180. **Table 7-4** shows the peak snow traffic with the 0.5% growth factor.

**Table 7-4: Snow Traffic with 0.5% Growth Factor**

Northbound	Southbound	
	MD	PM
758	258	432

### Peak Hour Volumes

For the purposes of this analysis, year 2040 is considered as the design year. Peak hour turning movement volumes for the intersections along the US 180 study corridor were developed by applying the growth rate to the existing 2017 traffic volumes and adding the peak snow traffic volumes. Peak hour traffic volumes for the year 2040 along the US 180 study corridor are developed as follows:

1. Turning movement volumes on US 180 and approach volumes on the side streets during the Mid-day and PM peak hours – existing 2017 traffic volumes \* 1.5% exponential growth rate, as described in **Growth Rate** section.
2. Northbound volume on US 180 during the Mid-day peak hour shall be the addition of the following volumes:
  - a. existing 2017 traffic volumes \* 1.5% exponential growth rate, as described in **Growth Rate** section,
  - b. Peak northbound Mid-day peak hour snow traffic, shown in **Table 7-4**.
3. Northbound volume on US 180 during the PM peak hour – existing 2017 traffic volumes \* calculated exponential growth rate of 1.35%, as shown in **Table 7-1**.
4. Southbound traffic volume on US 180 during the Mid-day peak hour shall be the addition of the following volumes:
  - a. existing 2017 traffic volumes \* 1.5% exponential growth rate, as described in **Growth Rate** section,
  - b. Peak southbound Mid-day peak hour snow traffic, shown in **Table 7-4**.
5. Southbound traffic volume on US 180 during the PM peak hour shall be the addition of the following volumes:
  - a. existing 2017 traffic volumes \* 1.5% exponential growth rate, as described in **Growth Rate** section,
  - b. Peak southbound PM peak hour snow traffic, shown in **Table 7-4**.
6. Traffic volumes at the intersection of Milton Road and Humphreys Street:
  - a. existing 2017 traffic volumes \* 1.5% exponential growth rate, as described in **Growth Rate** section,
7. Peak southbound PM peak hour snow traffic, shown in **Table 7-4**.

Peak hour traffic volumes for the year 2040 are shown in **Figure 7-1**.



### Future Intersection Operational Analysis

The operational analysis for the future conditions was conducted utilizing the projected turning movement volumes with existing roadway geometry, traffic control and signal timing. **Figure 7-2** shows the intersection control and lane geometry for the year 2040 along the US 180 study corridor.



Figure 7-1: 2040 Peak Hour Traffic Volumes Including Snow Traffic Volumes

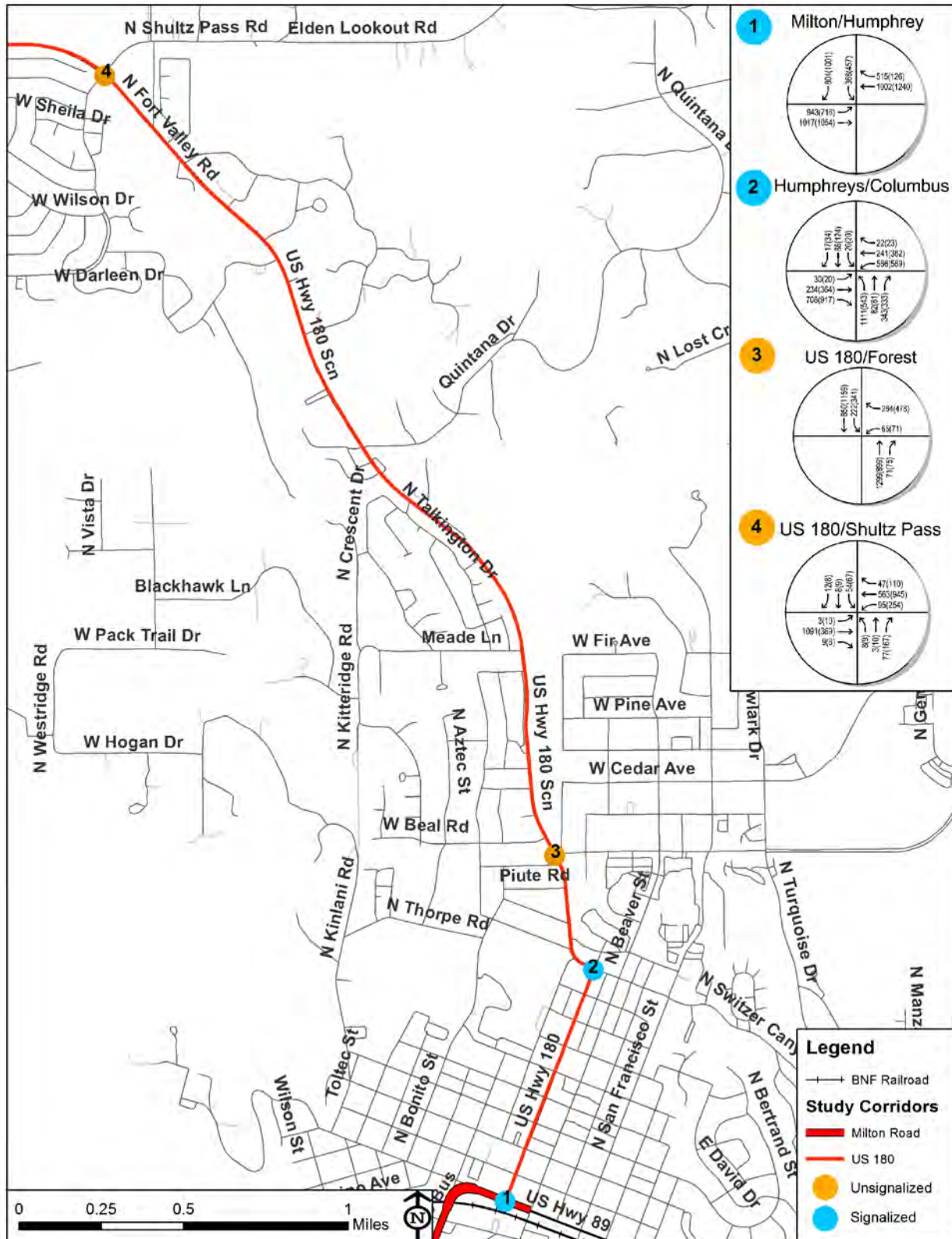
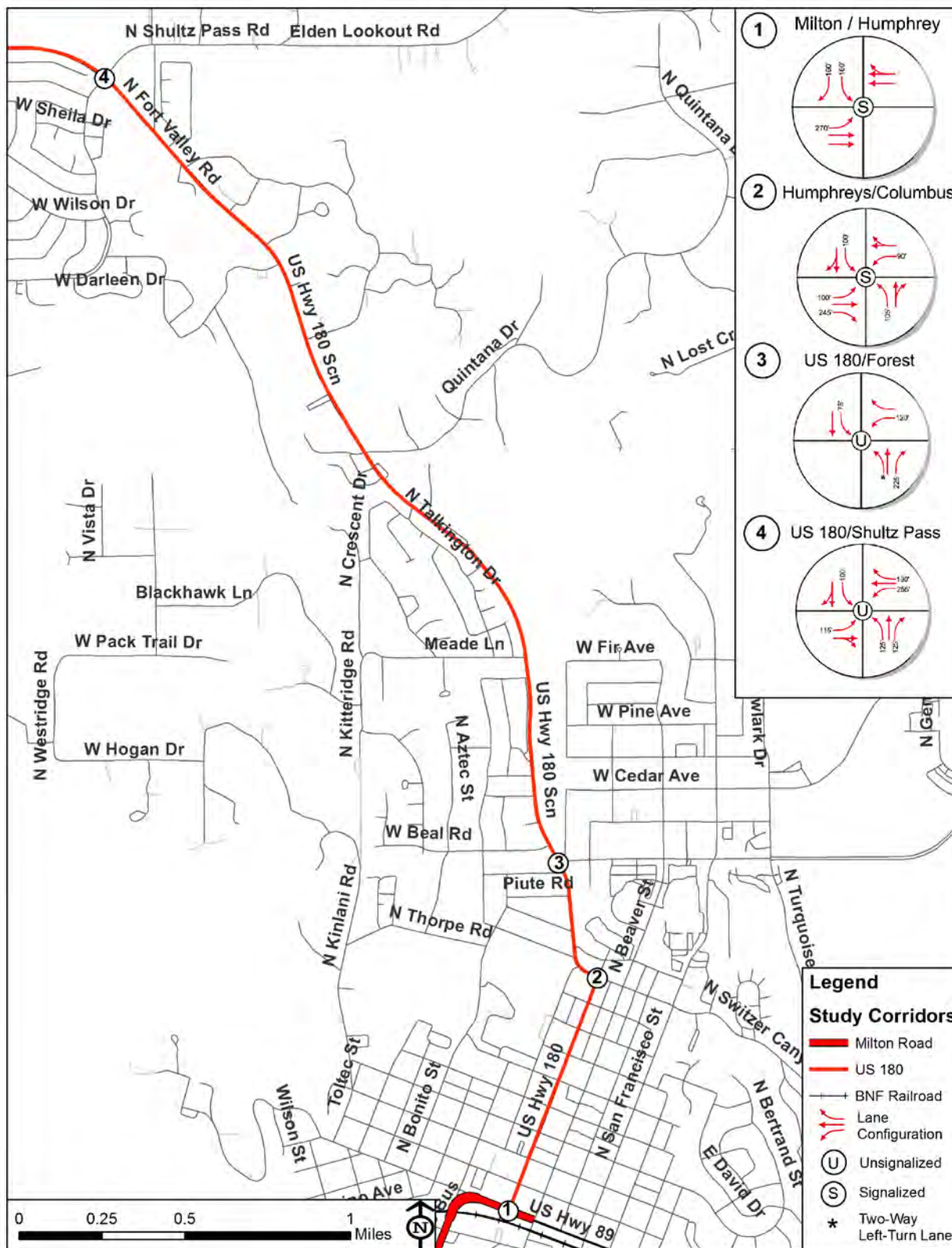


Figure 7-2: 2040 Intersection Control and Lane Geometry



## Design Year 2040 LOS

Level-of-Service for the study area intersections along the US 180 study corridor is analyzed for the year 2040 with the Mid-day and PM peak hour traffic volumes. The LOS for the signalized and unsignalized study area intersections are described in **Existing Intersection LOS** section of this report. Future 2040 peak hour traffic volumes, shown in **Figure 7-1**, and future intersection control and lane geometry, shown in **Figure 7-2**, were utilized to determine the future 2040 peak hour LOS at the study area intersections. **Table 7-5** presents the 2040 peak hour LOS summary for the intersections along the US 180 study corridor. The input and output of these analyses are provided as **Appendix X** to this report.

**Table 7-5: 2040 Peak Hour LOS at Signalized and Unsignalized Intersections**

Intersection	Approach	2040 MD Peak		2040 PM Peak	
		LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)
<b>Milton Rd and Humphreys St</b>	Northbound	-	-	-	-
	Southbound	F	404.9	F	1476.8
	Eastbound	F	572.2	F	263.6
	Westbound	F	622.0	F	152.6
	<b>Overall</b>	<b>F</b>	<b>546.3</b>	<b>F</b>	<b>615.6</b>
<b>Humphreys St and Columbus Ave</b>	Northbound	F	1256.9	F	92.0
	Southbound	D	35.4	D	42.1
	Eastbound	E	67.4	F	1035.9
	Westbound	F	290.2	F	407.2
	<b>Overall</b>	<b>F</b>	<b>648.8</b>	<b>F</b>	<b>540.3</b>
<b>US 180 and Forest Ave</b>	Northbound	A	0.0	A	0.0
	Southbound	A	3.4	A	3.1
	Eastbound	-	-	-	-
	Westbound	F	572.3	F	738.5
	<b>Overall</b>	<b>F*</b>	<b>69.3</b>	<b>F*</b>	<b>135.7</b>
<b>US 180 and Shultz Pass Rd</b>	Northbound	C	20.0	C	20.7
	Southbound	C	20.3	C	20.5
	Eastbound	F	152.4	A	7.5
	Westbound	C	23.4	C	22.7
	<b>Overall</b>	<b>F</b>	<b>95.4</b>	<b>B</b>	<b>19.4</b>

\*Synchro output did not include HCM LOS. LOS reported is based on the Average Delay

As shown in **Table 7-5**, the overall 2040 peak hour LOS at the intersections along the US 180 study corridor is expected to be “F” at the signalized and unsignalized study area intersections with the exception of US 180 and Shultz Pass Road. US 180 and Shultz Pass Road is expected to operate at LOS “B” during the PM peak hour.

The high traffic volumes on US 180 and existing intersection control and lane geometry can be attributed to the poor LOS at the intersections along the US 180 study corridor.



## Short-Term Projected Traffic Conditions and Needs

In addition to the design year 2040 analysis, operational analysis at the intersections was performed to determine the growth rate and the timeline when the intersections along the US 180 study corridor could not handle the projected traffic volumes with the existing intersection control and lane geometrics.

Different iterations were performed by applying 2% and 3% exponential growth rates to the 2017 traffic volumes at the study intersections. The 2017 existing intersection control, lane geometrics and signal timing were used for the iterations. Based on the results of these analysis, the following intersections are expected to operate at unacceptable LOS:

- Clay/Butler Avenue – in approximately 4 years with 2% exponential growth rate and 2.5 years with 3% exponential growth rate,
- Clay/Butler Avenue and Forest Meadows Street – in approximately 4.75 years with 2% exponential growth rate and 3 years with 3% exponential growth rate,
- Clay/Butler Avenue, Forest Meadows Street and Malpais Lane – in approximately 7 years with 2% exponential growth rate and 4.75 years with 3% exponential growth rate,
- Clay/Butler Avenue, Forest Meadows Street, Malpais Lane and Route 66 – in approximately 8.5 years with 2% exponential growth rate and 5.5 years with 3% exponential growth rate, and
- Humphreys Street, Clay/Butler Avenue, Route 66, Forest Meadows Street, Phoenix Avenue and Malpais Lane – in approximately 9 years with 2% exponential growth rate and 6 years with 3% exponential growth rate.





## CHAPTER 8: US 180 CORRIDOR MASTER PLAN ENVIRONMENTAL OVERVIEW

The purpose of the environmental overview for the US 180 Corridor Master Plan is to outline existing environmental resources, conditions and information in the study area by describing the natural, cultural and social resources, and environmental conditions and potential concerns. This information will be used to both avoid developing alternatives that should be ruled out based on environmental challenges that likely can't be overcome as well as recognizing and minimizing environmental impacts in alternatives that will be carried forward for added evaluation and study.

This is not the first environmental overview performed in the study area. This overview represents a combination of some newly obtained information and a significant compilation of existing information from previous studies. In fact, specific guidance from the Project Partners suggested that due to the large volume of existing environmental overview information from other recent studies in the area, the Project Partners desired that this environmental overview be streamlined to summarize the most salient components from existing studies and minimize the efforts to generating new data to the extent it is already available. Much of the information summarized herein is provided from a recent environmental overview for the Flagstaff/Northern Arizona Intergovernmental Public Transportation Authority (NAIPTA) Transit Spine Route Study (Kimley-Horn, 2016) and the Fort Valley Highway 180 Scenic Corridor Area Plan (2011) is relevant for this corridor.

### General Information

Environmental stewardship in Flagstaff and Coconino County are long held core values. The Flagstaff Regional Plan 2030 identifies eight guiding principles identified to help promote future development. These eight guiding principles represent the collective community values. These sample principles have carried on into the Blueprint 2040 regional plan. These include: the environment matters, sustainability matters, a smart and connected community matters, prosperity matters, people matter, place matters, cooperation matters and trust and transparency matter. A key point identified in this is that it is important to the community not to sacrifice natural resources. The number one value for the community was open space.

Key environmental issues noted at a February 2016 FMPO/ADOT long range transportation planning meeting for the region had attendees expressing support (p. 32, Blueprint 2040) for an “increased focus on system preservation, creating redundancy and resiliency across all modes and particularly in rural areas, strong support for tourism and recreation and sensitivity to environmental concerns.” Key environmental issues or concerns noted were noise pollution, salt on roads, wildlife and dark skies lighting.

There is year-round tourism in the area with Snowbowl, the North Pole Experience, Bearizona and the Twin Arrows Casino in the region. Increased winter season tourism activity for key snow play recreation destinations along US 180 such as the Arizona Snow Bowl Resort, Wing Mountain Recreation Area (no current permittee in 2018), Crowley Pit and the Arizona Nordic Village attract visitors and compound traffic congestion on US 180, particularly at peak morning and afternoon travel times on holiday weekends.



The Fort Valley Highway 180 Scenic Corridor Area Plan focuses on an overriding concern to the quality of life of residents, property owners and visitors. There is a desire to maintain the aesthetic qualities of the area and a desire to maintain a more independent lifestyle without excessive regulation by the County. Important issues noted in the Fort Valley Area Plan include: Natural Environment, Water and Wastewater, Public Safety, Utilities and Solid Waste Disposal, Transportation, Open Spaces, Natural Areas, and Outdoor Recreation, Community Character and Growth and Development (Fort Valley Plan, 2011; pp. ix-xii).

Key items noted in the plan include specific important issues including, “improvement of air quality by reducing smoke from wood stoves and dust from construction and roads, limitation of lighting to protect dark skies, protection of natural quiet from noise from roads and others sources, reduction of construction impacts on soils, management practices used in Coconino National Forest, maintenance of native vegetation, reduction of non-native plants, maintenance of wildlife corridors and habitat, and reduction of impacts on environmentally sensitive lands, especially floodplains and other wetlands.

Health and welfare of the community is encouraged by protecting and conserving existing water sources improving water quality and wastewater disposal, and reducing contaminants in stormwater runoff. (Fort Valley Plan, 2011; p. ix).”

## Threatened, Endangered & Sensitive Species

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) System (<https://ecos.fws.gov/ipac/>) was reviewed to identify special status state species and federally listed threatened, endangered and candidate species potentially affected by activities in the US 180 corridor. The IPaC system identifies species listed as threatened or endangered under the Endangered Species Act. In addition to this information, the IPaC system also identifies species that are candidates or are proposed for listing under the Endangered Species Act. The search of the IPaC system was conducted in January 2018. The species listed in the vicinity of the project area are listed in **Table 8-1**.

**Table 8-1: Federally Listed Species**

Common Name	Scientific Name	Status
<b>Birds</b>		
California Condor	<i>Gymnogyps californianus</i>	Experimental Population Non-Essential
California Condor	<i>Gymnogyps californianus</i>	Endangered
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	Threatened
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Threatened
<b>Reptiles</b>		
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	Threatened
<b>Fishes</b>		



Roundtail Chub	<i>Gila robusta</i>	Proposed Threatened
<b>Flowering Plants</b>		
San Francisco Peaks Ragwort	<i>Packera franciscana</i>	Threatened*

\*Final critical habitat for the San Francisco Peaks Ragwort has been determined. This project area is outside the critical habitat area.

Mexican Spotted Owl critical habitat is near the corridor and also immediately borders the existing right of way at Mileposts 233-235.

In addition to the endangered species information, there are 19 species of migratory birds that may impact the project area. These include the bird species noted in **Table 8-2**.

**Table 8-2: Migratory Birds potentially impacted by the Project Location**

Common Name	Scientific Name	Status
<b>Migratory Birds</b>		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not a BCC*; Concern due to Eagle Act
Bendire’s Thrasher	<i>Toxostoma bendirei</i>	BCC
Black Throated Sparrow	<i>Amphispiza bilineata</i>	BCC
Black-chinned Sparrow	<i>Spizella atrogularis</i>	BCC
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	BCC
Chestnut-collared Longspur	<i>Calcarius ornatus</i>	BCC
Elf Owl	<i>Micrathene whitneyi</i>	BCC
Golden Eagle	<i>Aquila chrysaetos</i>	Not a BCC; Concern due to Eagle Act
Grace’s Warbler	<i>Dendroica graciae</i>	BCC
Gray Vireo	<i>Vireo vicinior</i>	BCC
Lark Bunting	<i>Calamospiza melanocorys</i>	BCC
Lewis’s Woodpecker	<i>Melanerpes lewis</i>	BCC
Mexican Whip-poor-will	<i>Antrostomus arizonae</i>	BCC
Phainopepla	<i>Phainopepla nitens</i>	BCC
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	BCC
Red-faced Warbler	<i>Cardellina rubrifrons</i>	BCC



Common Name	Scientific Name	Status
<b>Migratory Birds</b>		
Rufous Hummingbird	<i>Selasphorus rufus</i>	BCC
Rufous-winged Sparrow	<i>Aimophila carpalis</i>	BCC
Virginia’s Warbler	<i>Vermivora virginiae</i>	BCC

\*BCC = Bird of Conservation Concern

It should be noted that the Coconino National Forest also maintains a forest service sensitive species list and a list of Management Indicator Species. Any projects that occur on the Coconino National Forest must review and analyze species on these lists. These lists are currently found at the following website, [https://www.fs.usda.gov/detail/coconino/landmanagement/resourcemanagement/?cid=fsbdev3\\_054807](https://www.fs.usda.gov/detail/coconino/landmanagement/resourcemanagement/?cid=fsbdev3_054807) . It is recommended the Coconino National Forest be contacted to verify these represent the most current information available.

It is also recommended that a more in-depth evaluation should occur prior to any construction or modifications to the roadway. A new biological review should also be performed to see if any new information is known within the project area prior to new development or redevelopment occurring.

## Wildlife Movement

Largely developed urbanized areas, such as along the US 180 corridor, present a barrier to the movement of wildlife. Many rural areas just outside the city of Flagstaff of course represent large swatches of publicly managed lands where wildlife is abundant. According to the Arizona Wildlife Linkages Workgroup (AWLW) Wildlife Linkages Assessment report, the US 180 corridor traverses through two wildlife linkage areas. The AWLW represents a collaboration between ADOT and nine other public and non-profit agencies to identify statewide wildlife movement corridors amongst large publicly managed land areas. According to the Arizona Game and Fish Online Environmental Review Tool (<https://azhgis2.esri.com>), there is a wildlife corridor identified as the Peaks to Rim Linkage Design that is near the Fort Valley area.

The two wildlife linkages are linkage 14- Valle – Bellemont (p. 49) and linkage 16 – Flagstaff (p. 50) depicted in **Figure 8-1**.

The Valle-Bellemont linkage runs along US 180 for roughly one mile on each side of the corridor. The linkage area is predominately Petran Montane Conifer Forests but also contain Great Basin Conifer Woodlands and Plains and Great Basin Grasslands. the identified species migratory and movements patterns effected by the corridor include Allen’s Big-eared, American Peregrine Falcon, Arizona Myotis, Black bear, Elk, Fringed Myotis, Long-eared Myotis, Long-legged Myotis, Mexican Spotted Owl, Mountain Lion, Mule Deer, Navajo, Mexican Vole, Northern Goshawk, Northern Leopard Frog, and Pale Townsend’s Big-eared Bat. Development and urbanization within the linkage area are the only other threats other than the US 180 corridor.

The Flagstaff linkage area surrounds the city of Flagstaff with predominantly Petran Montane Conifer Forest vegetation and the identified species migratory and movements patterns effected by the corridor



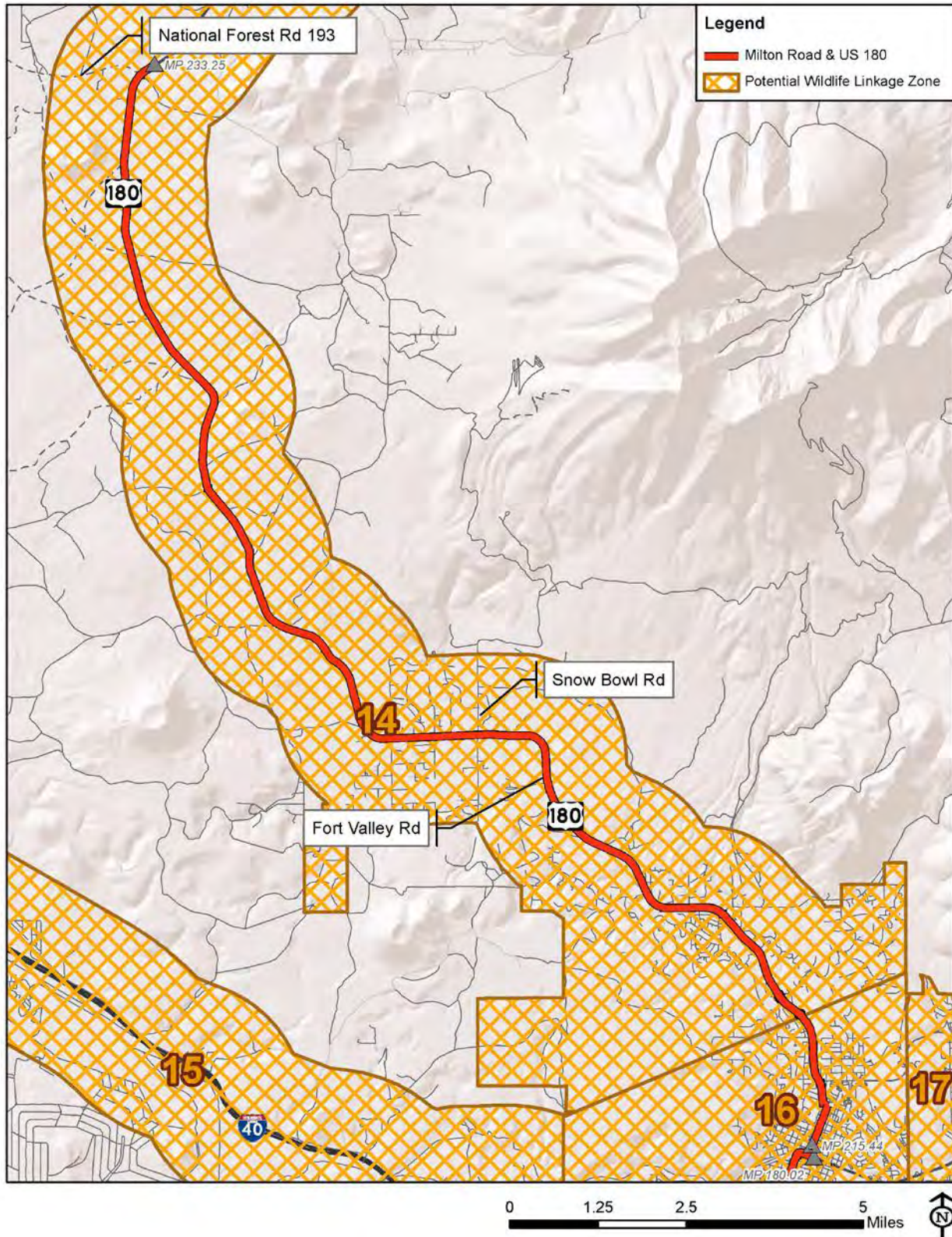
include Allen’s Big-eared Bat, Arizona Myotis, Black Bear, Elk, Fringed Myotis, Gray Fox, Mexican Spotted Owl, Northern Goshawk, and Riparian Obligates. The other major threats to the Flagstaff Wildlife Linkage are the BSNF railroad, I-40 and urbanization

Within the US 180 Corridor, there has been some discussion about a US 180 bypass due to the impact of winter activity on the US 180 corridor. Although, it is not included in the Blueprint 2040 plan in the foreseeable future, it was expressed that measures should be taken to protect wildlife and prevent development from expanding in the corridor (p. 32, Blueprint 2040). If a bypass is envisioned in the future, consideration for wildlife movement should be taken into account. Blueprint 2040 (p. 182) states that there is no US 180 bypass in the plan for two primary reasons, “First, it is not clear a majority of the region supports the facility. Second, it is expensive and largely serves a need experienced 15-20 days of the year. Other reasons include environmental impacts. Blueprint 2040 policy is to preserve the opportunity for the facility while continuing to seek solutions”.

One of the items noted in Blueprint 2040 (pp. 32 & 218) was the desire for the Flagstaff region to consider the establishment of an urban wildlife policy. It has been noted that in several locations within existing and future areas, roadways and wildlife have the potential to come into conflict with one another with undesirable outcomes. By establishing an urban wildlife policy, this could assist with safety efforts and wildlife habitat protection. A future evaluation should look into whether there is an urban wildlife policy that could impact this project area.



Figure 8-1: Wildlife Linkage Zones



Source: ADOT Wildlife Linkages Assessment



## Invasive, Noxious Weeds & Protected Arizona Native Plants

As noted in the Microsimulation Environmental Overview Study (Kimley Horn, 2016), no invasive/noxious weed species were noted during a windshield reconnaissance survey for the US 180 study area. It is recommended that prior to construction, a presence/absence survey should be conducted to determine if any species are present in the construction area and to determine if any mitigation measures are required per Executive Order 13112 and the Arizona Native Plant Law.

Similarly, a native plant survey should also be conducted for individual development projects/sites to determine if any protected native plant species are impacted due to a future development project.

It is also advisable that prior to conducting these surveys that the ADOT biology team and Natural Resources professionals in the North-Central District should be consulted to determine their experience with invasive/noxious weeds and native plants in the project area.

## Water Quality, Water Resources & Floodplains

The US 180 Corridor is located within both the Little Colorado/San Juan and the Verde Watersheds (**Figure 8-2**).

There are no impaired or outstanding waters in the study area. ADEQ’s electronic mapping portal (<http://gisweb.azdeq.gov/arcgis/emaps/?topic=assessed>) does not show any water quality concerns at this time. In the future, should development occur in the corridor, the impaired water list and outstanding waters list should be reviewed for any updates. Should new waters be listed, there may be a requirement to address water quality concerns.

The City of Flagstaff and Coconino County are regulated by the Phase II stormwater program administered by ADEQ under AZPDES permit AZG2016-002.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for the study area indicates that the area has mapped floodplains. The list of FEMA FIRM panels in the study area include:

- 04005C6809G
- 04005C6806G
- 04005C6807G
- 04005C6802G
- 04005C6440G
- 04005C6425G
- 04005C5975G

**Figure 8-3** illustrates the floodways in proximity to the Study Area. The first location is where the Rio de Flag intersects with US 180 west of Snowbowl Rd near Catalina Road. There is currently a culvert and other stormwater infrastructure in place to mitigate flooding. The land surrounding this location falls within both the 100-year and 500-year flood plains, indicating a 1% and .02% chance this area will experience flooding every year. The second location is where the Rio de Flag meanders along US 180 near Hidden Hollow Road, and US 180 falls within both the 100- and 500-year floodplains for roughly a half-mile between Meadow Lane and Failte Lane. The third location along US 180 threatened by flooding is north of Quintana Drive where Schultz Creek intersects with US 180. There is currently a culvert and other infrastructure installed at this location to address immediate flooding concerns, however, some parts of US 180 fall within both the 100- and 500-year floodplains.



As noted in the Kimley-Horn report (pp. 16-18, 2016) a summary of groundwater conditions, surface water conditions, sections 401, 402 (stormwater - AZPDES) and 404 of the CWA as well as floodplains are described. Key environmental considerations for future development evaluations would need to include considerations for 404 permits, 401 certification statements and issues related to the City of Flagstaff and/or Coconino County's MS4 permits.

**Figure 8-2: Arizona Watersheds**

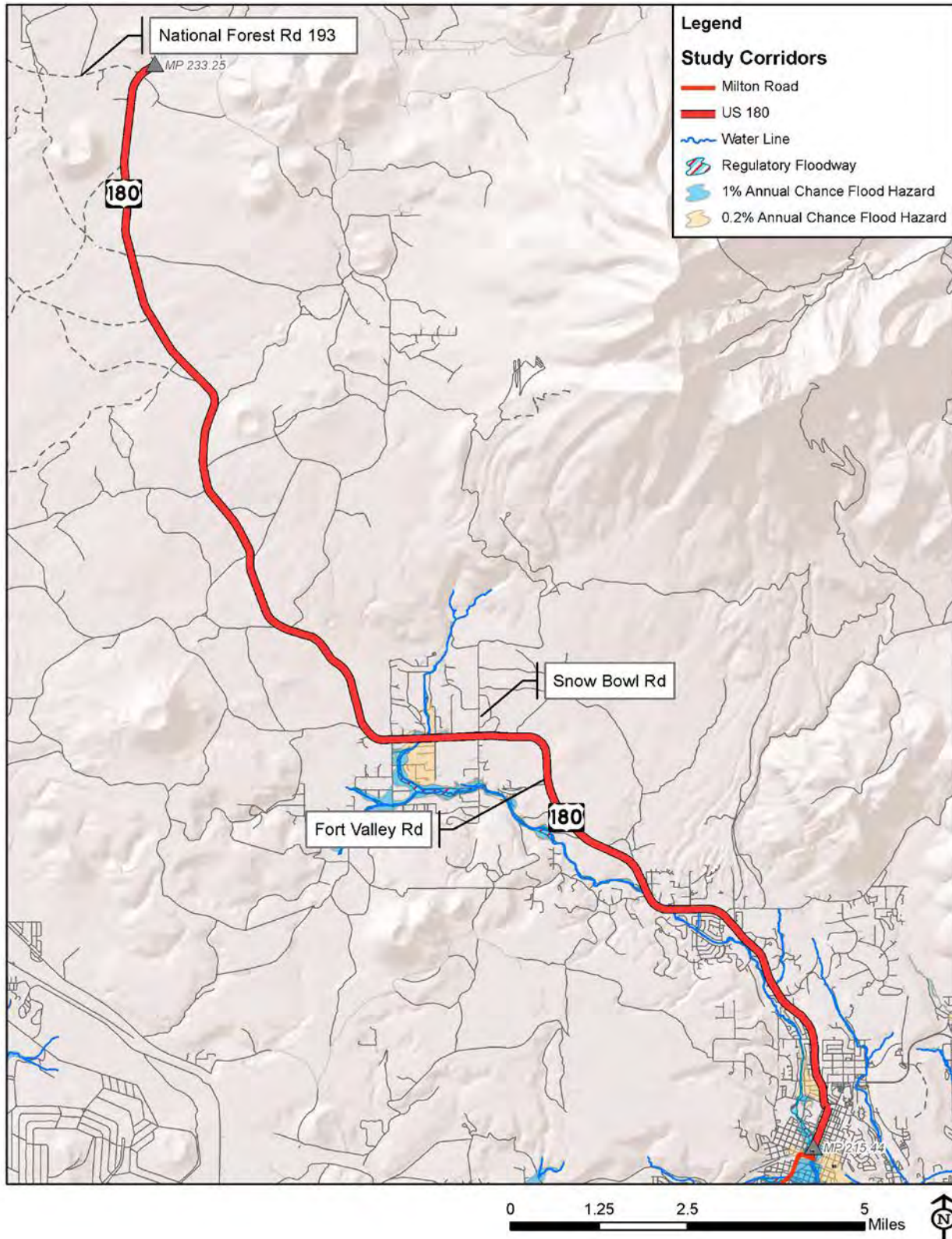


Source: US Department of Agriculture (USDA): Natural Resources Conservation Service - Arizona





Figure 8-3: Flood Hazard



Source: Federal Emergency Management Agency (FEMA) National Flood Hazard Layer



## Noise

Noise generated by high capacity roadways such as US 180 is a condition that occurs with urbanization and must be balanced by developing appropriate land uses along high capacity corridors. The evaluation of alternatives for the US 180 CMP should consider the land uses adjacent to the proposed alternatives. ADOT's Noise Abatement Policy and FHWA Noise Abatement Criteria identify generally acceptable levels of traffic noise for varying land use types. US 180 is a designated scenic corridor that travels through predominately residential and rural environments. ADOT and FHWA will consider mitigation measures for homes, schools and churches for noise levels of 64 dBA or higher.

Noise should to be generally be evaluated in the review of viable alternatives to ensure there are no disproportionately high and adverse effects of transportation programs, policies, and activities on minority and low-income populations for Title VI Environmental and Social Justice evaluation. If noise if found to be a concern when considering alternatives, a detailed noise study (beyond the scope of this project) would need to be conducted to identify if existing or proposed noise levels exceed acceptable noise thresholds.

ADOT recently updated their noise policy in May 2017. It is called the "Arizona Department of Transportation Noise Abatement Requirements". All federal projects that require a new noise analysis or existing projects that have yet to begin a noise analysis are required to follow these new requirements.

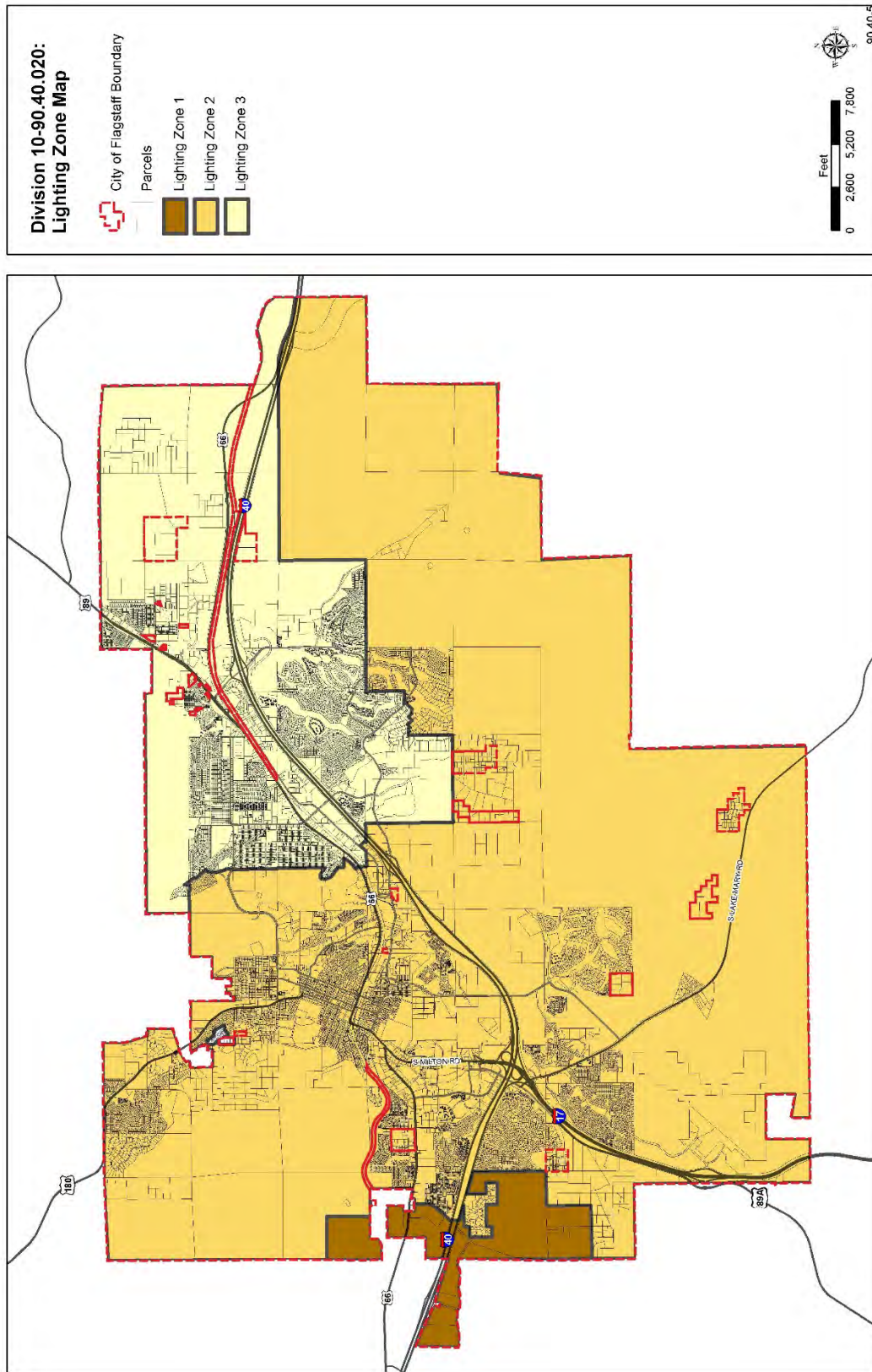
## Visual Resources

Visual resources in the area are described on pages 40-41 of the Microsimulation Environmental Overview Study (Kimley Horn, 2016). The San Francisco Peaks Scenic Road is along US 180 and extends north of the City of Flagstaff.

In addition to the discussion of visual resources and viewsheds in the area, there is a great deal of concern in the Flagstaff area and northern Arizona related to ambient light pollution and sky glow. The City of Flagstaff has adopted lighting standards (Division 10-50.70: Outdoor Lighting Standards) that resulted in its recognition as the world's first International Dark Sky City in October 2001 (**Figure 8-4**). The lighting code is greatly valued by residents of the area. It helps ensure the dark skies are enjoyed by the Flagstaff community, its visitors and still provide safe and efficient lighting for public safety and provides an ideal natural resource for the astronomical industry in the area. The Flagstaff Dark Skies Coalition celebrates, promotes and protects the glorious dark skies of Flagstaff and northern Arizona. The support and importance to the public on maintaining Flagstaff's dark skies has and Northern Arizona skies has been noted in many reports, studies, and public meetings over the years. It has been referenced most recently in the Fort Valley Plan (2011), the NAIPTA study (2016) and Blueprint 2040 (2017). Although a study of lighting standards and light pollution is not directly required by NEPA, consideration into the importance of maintaining dark skies in the area is highly valued. Given the designation of the corridor, measures should be taken to address these issues as further development in the corridor occurs and spending the time on the resources to be protected is important.



**Figure 8-4: City of Flagstaff Lighting Zone Map**



## Air Quality

Air quality in the US 180 corridor (and surrounding areas in Flagstaff and Coconino County) is in attainment for all criteria pollutants, which include Ozone, Particulate Matter and Carbon Monoxide. ADEQ’s electronic mapping portal (<http://gisweb.azdeq.gov/arcgis/emaps/?topic=nonattain>) does not show any nonattainment areas near the study area at this time. Should future development occur in the corridor, a reassessment to verify this is still the case is warranted.

As noted in the Blueprint 2040 Regional Transportation Plan (Chapter 17, p. 204), “The Flagstaff region’s air quality is currently in attainment, so the region is not eligible to receive special funding. However, ozone levels have exceeded federal limits to the extent that the Arizona Department of Environmental Quality briefly considered recommending to the EPA that Coconino County be designated as non-attainment for ozone. Implementing low cost solutions now can mitigate future mandated processes and solutions that will be more expensive.” If dust control measures are not appropriately implemented during construction activity there is the potential for temporary negative air quality impacts.

Winter traffic congestion due to the winter snowplay areas resulted in a great deal of attention within the Fort Valley planning area about the possibility for the construction of a road linking Highway 180 to Interstate 40 and bypassing the City of Flagstaff. This area plan was developed in 2011, but through subsequent discussions and the development of Blueprint 2040, the US 180 bypass was not included in the long range plan. Although at this time a potential bypass is not included in Blueprint 2040 (2017), there is still some consideration for further study and evaluation if conditions change.

There has also been concern expressed regarding the use of salt on roads at public meetings due to its potential environmental impact. If salt is not used, other alternatives may include the expanded use of sand and cinders. Particulate matter from sand and cinders has the potential to become air borne and thus an air quality concern. As a result, an awareness of winter storm management operations by ADOT and the City of Flagstaff may need to be reviewed prior to drawing any conclusions on air quality in the region.

## Hazardous Materials

A review performed by Kimley Horn in the Microsimulation Environmental Overview Study identified over 200 regulated facilities throughout the NAIPTA study area (Section 3.6, Kimley-Horn, 2016). Documented concerns included underground storage tanks, leaking underground storage tanks and varying degrees of contamination related to soil and or groundwater.

**Figure 8-5** shows the underground storage tanks and leaking underground storage tanks adjacent to the US 180 Corridor. There are a total of 14 underground storage tanks and two leaking underground storage tanks. One of the two of leaking underground storage tanks are closed. One of the Fort Valley Gaser underground storage tanks near the southern extents of the corridor at the northwest corner of the intersection of Columbus Avenue and Humphreys Street leaking tank that has not been decommissioned. Refer to **Table 8-3** list the underground storage tanks adjacent to the US 180 corridor.



**Table 8-3: Underground Storage Tanks**

Name/Location	Number of Tanks	Status
<b>All Underground Storage Tanks</b>		
Exxon – Fort Valley	5	Closed: 5 Open: 0
Fort Valley Chevron	3	Closed: 0 Open: 3
Fort Valley Gaser	3	Closed: 0 Open: 0
Kendrick Park	2	Closed: 2 Open: 0
Purcell	1	Closed: 1 Open: 0
<b>Leaking Underground Storage Tanks</b>		
Exxon – Fort Valley	1	Closed
Fort Valley Gaser	1	Open

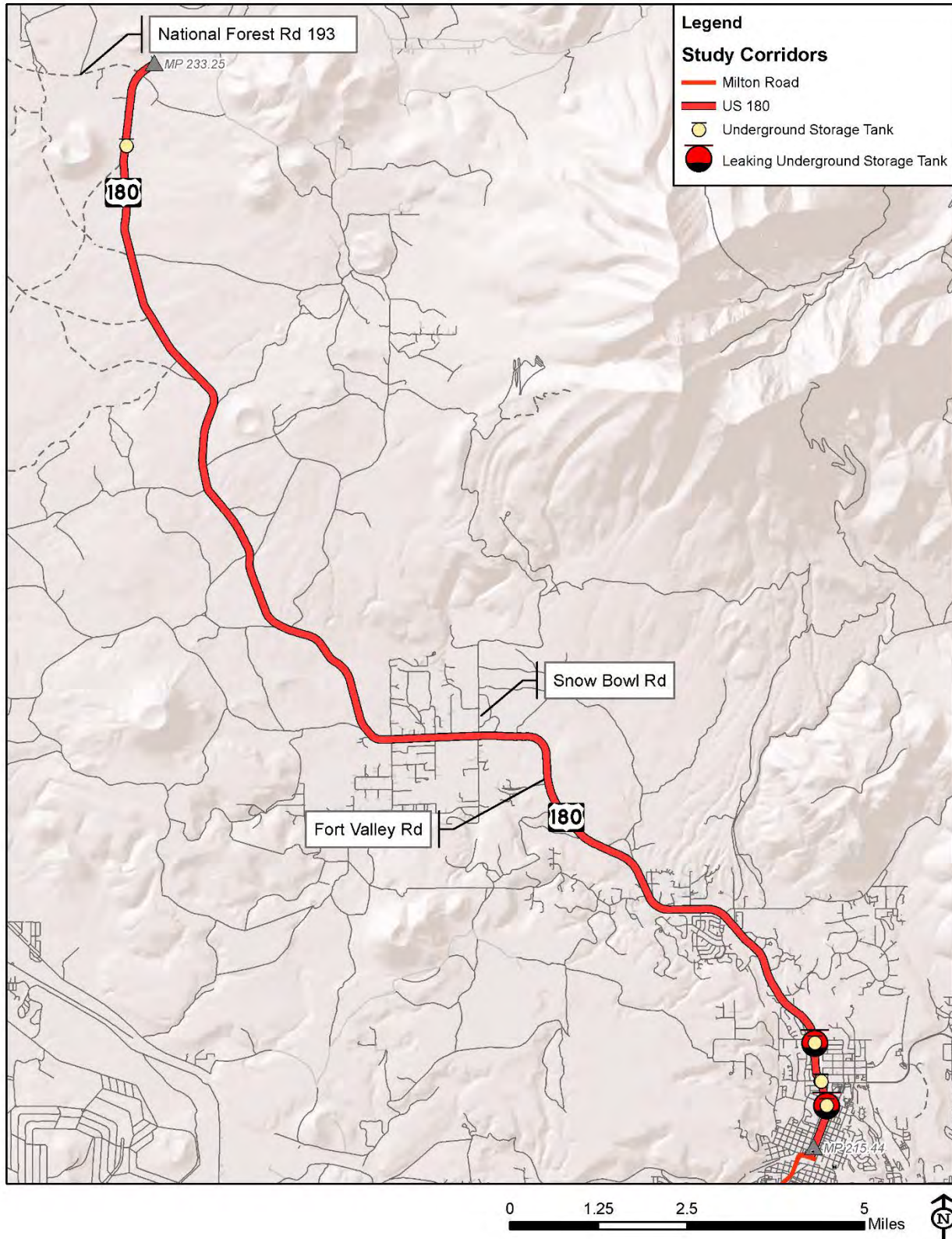
Source: Arizona Department of Environmental Quality (ADEQ)

Remediation of some facilities was pending or undocumented. Should there be any land acquisitions, or easements a Phase I Environmental Site Assessment would be recommended. Hazardous materials surveys should be conducted for any abatement/demolition of any buildings with asbestos surveys and any paint striping on the roadway or highways should be evaluated for lead based paint prior to any disturbance including milling or grinding operations. These evaluations would need to be done prior to any disturbance and would require coordination with the Hazardous Materials Coordinator at ADOT in the Environmental Planning Group.

Furthermore, there are no hazardous materials restricted routes in northern Arizona or the study area.



Figure 8-5: Underground Storage Tanks



Source: Arizona Department of Environmental Quality (ADEQ)



## Cultural Resources

This section presents an overview of cultural resources that occur within the study area, which is defined herein as a 200-ft wide corridor along US 180, which shares the Humphrey’s Street and Fort Valley Road alignments. The study area extended a distance of approximately 11 miles from the intersection of historic Route 66 in Flagstaff, to CNF Road 222B, near the Wing Mountain Snow Play Area. A formal Class I literature review was not completed for this Corridor Master Plan study. For this project, Archaeological Consulting Services, Ltd. (ACS) conducted a desktop review of the online AZSITE Cultural Resources Database (AZSITE), the ADOT Historic Preservation Team Portal (Portal), and the online repository of the National Register of Historic Places (NRHP) to identify archaeological sites, historical structures (both in-use and abandoned), and historic-age buildings. ACS also visited the Arizona State Historic Preservation Office (SHPO) to obtain information on architectural surveys conducted along the corridor. Finally, ACS contacted the City of Flagstaff’s Historic Preservation Office to obtain any information on locally listed or inventoried historic neighborhoods and individual historic buildings within or immediately adjacent to the 200-ft wide study area. No field visits or surveys were conducted for this study.

Limited archival research was conducted in order to identify building resources that were greater than 50 years of age (resources constructed prior to 1968). Given the limited scope of work for this phase of the project, only online sources were reviewed to identify historical resources within the study area. The archival research was conducted by Thomas Jones, ACS Historian, and included a review of online USGS aerial photographs, supplemented by the parcel information available on the Coconino County Assessor’s online interactive parcel viewer (Coconino County 2017; U.S. Geological Survey 2017).

The limited cultural resource review identified a total of 69 cultural resources within or immediately adjacent to the study area, including six archaeological sites, three in-use historic structures, one NRHP-listed historic property, three NRHP-listed historic districts, and 45 individual historic-age buildings, most of which have not been documented or evaluated for eligibility in the NRHP. The three in-use historic structures are linear highways (i.e., US Highways 66, 89, and 180), all of which have been determined eligible under Criterion D as part of the Arizona State Highway System (1912–1955) (Federal Highway Administration and Arizona State Historic Preservation Office 2002). Per the *Interim Procedures for the Treatment of Historic Roads* (2002), impacts to characteristics of a historic highway eligible under Criterion D are assessed to determine if the location or function/design of a roadway will be affected, which would result in an adverse effect to the resource. Ubiquitous components of the Historic State Highway System are not typically recommended for further documentation in a formal Historic State Highway System report in accordance with the *Interim Procedures*, which state that only “historic roadway features...considered worth recording...would be documented” with photographs and a feature table including appropriate measurements and descriptions.

Of additional consideration, per the *Interim Procedures for the Treatment of Historic Roads* (2002), Historic US Highway 66 (Route 66) and the Apache Trail, as “Crown Jewels” of the Arizona State Highway System, are to be evaluated under multiple criteria for eligibility to the NRHP (Federal Highway Administration and Arizona State Historic Preservation Office 2002). Therefore, in addition to Criterion D, Route 66 as a whole has also been determined eligible for inclusion in the NRHP under Criterion A for its association with the development of Federal Aid transportation projects in Arizona. In some



instances, Route 66 highway segments exhibiting distinctive engineering attributes or distinctive bridges and culverts have been determined eligible under Criterion C.

Additionally, a number of historic-age houses were located within or adjacent to the study area. These houses are located on the northern fringe of the Flagstaff municipal boundary and exemplify post-World War II expansion of the Flagstaff community (ca.1946–1970s). These houses are components of 11 residential subdivisions that would likely derive their NRHP significance under Criterion A for community planning and development. All houses located within and adjacent to the study area would require inventory to evaluate integrity within each subdivision, and to assess contributors to a potential historic residential district, as well as each subdivision's character-defining features (e.g., streets, vegetation, irrigation system, etc.).

Cultural resources identified by the research, including the 11 historic-age subdivisions, are presented in the tables below (**Table 8-4 - Table 8-5**). From this information, ACS identified areas of sensitivity along the US 180 corridor, including the presence of known Section 4f properties. Cultural resources that have been listed, or recommended/determined eligible for listing in the NRHP were coded in green. Cultural resources for which eligibility has not been evaluated were coded in yellow, and cultural resources recommended or determined ineligible were coded in red. Areas not coded represent locations not associated with a known cultural resource.

As noted above, the purpose of this study was to identify known cultural resources that intersected the study area corridor. As the project area itself was not defined for the current effort beyond the 200-ft wide study corridor, should additional phases of the project advance for further consideration, ACS recommends that future studies include identification of a formal area of potential effects, followed by a formal Class I literature review, Class III survey (as needed), and historic building inventory and assessment to fully determine any historic properties that occur within or adjacent to the corridor.





**Table 8-4: Summary of Previously Recorded Cultural Resources**

Site Number <sup>1</sup>	Site Type	Eligibility (Criterion) <sup>2</sup>	Section 4f Resource	Reference(s)
<i>AZ I:3:10(ASM)</i>	Historic US Highway 89	Determined Eligible (D) (SHPO: 11/15/2002)		(Federal Highway Administration and Arizona State Historic Preservation Office 2002; Stone 1985)
<i>AZ I:14:5(ASM)</i>	Beale Wagon Road	Determined Eligible (A,B) (SHPO: 10/22/2008)	Yes	AZSITE Inventory No. 60033 (Weaver 1992)
<i>AZ I:14:337(ASM)</i> <i>AR-03-04-03-123(CNF)</i>	Possible logging camp w/features and artifacts	Unevaluated		AZSITE Inventory No. 60155
<i>AZ I:15:156(ASM)</i>	Historic US Highway 66	Determined Eligible (A,C,D) (SHPO: 11/15/2002 and 5/10/2011)	Yes	(Federal Highway Administration and Arizona State Historic Preservation Office 2002; Lonardo 2006)
<i>AZ Q:7:74(ASM)</i>	US 180 and SR 61	Determined Eligible (D) (SHPO: 5/29/2007)		AZSITE Inventory No. 87256 (Bowler 2012)
<i>NA 16331</i>	McMillan Homestead and wagon trail (Museum of Northern Arizona)	National Register Listed (C) (SHPO: 3/5/1975)	Yes	AZSITE Inventory No. 80635 (Wilson 1975)
<i>NA 18221</i>	Historic trash scatter	Unevaluated		AZSITE Inventory No. 81463
<i>NA 18228</i>	Abandoned logging camp with structures and artifacts	Unevaluated		AZSITE Inventory No. 81468
<i>NA 18231</i>	Trash scatter/dump	Unevaluated		AZSITE Inventory No. 81465
<i>AR 03-04-03-4735(CNF)</i>	No information	No information		ADOT Portal Record Search
	Flagstaff Townsite Residential Historic District	Determined Eligible (A,B,C) (SHPO: 2/20/1986)	Yes	(Woodward and Stein 1985)
	North End Historic Residential District	Determined Eligible (A,B,C) (SHPO: 2/20/1986)	Yes	(Woodward et al. 1985)
<i>NA 19395</i>	USFS Fort Valley Experimental Forest Station Historic District	Determined Eligible (A,B,C) (SHPO: 6/6/2000)	Yes	(Olberding 1998)

<sup>1</sup> Italicized site numbers represent in-use structures or resources.

<sup>2</sup> Recommended=Archaeologist's opinion; Determined: SHPO concurrence with recommendation.



**Table 8-5: Historical Buildings (Constructed prior to 1968)**

Parcel No.	Address	Property Name	Previously Inventoried/ Documented	Previous Project <sup>1</sup>	Eligibility Status <sup>2</sup>	Section 4f Resource	Comments
100-21-012A	211 W Aspen Avenue	Flagstaff City Hall (Hiway Diner No. 7)	Yes	Route 66 Survey (Inv. No. 309)	Not Eligible		Demolished
100-21-006	122 W Route 66	Rodeway Inn (Townhouse Motel)	Yes	Route 66 Survey (Inv. No. 310)	Recommended Ind. Eligible (A)	Yes	
100-10-012A	204 W Birch Ave	American Legion Post 3	No		Unevaluated		
100-10-020	215 N Humphrey's St	L.A.L.E. Salon	Yes	Flagstaff Townsite Residential District	Noncontributing		Postdates 1935
100-10-019	219 N Humphrey's St	Valerie Core Realtor	Yes	Flagstaff Townsite Residential District	Noncontributing		Postdates 1935
100-10-007	121 W Cherry Ave		No		Unevaluated		
100-09-001E	309 N Humphrey's St	Hair Trends	Yes	Flagstaff Townsite Residential District Inv. No. 5-17	Contributor (A, B, C)	Yes	
100-09-010	317 N Humphrey's St	Head First Hair Designs	No		Unevaluated		
100-09-009	319 N Humphrey's St	Vredevoogd, Lynn Ellen	No		Unevaluated		
101-13-008A	320 N Humphrey's St	San Francisco De Assisi Roman Catholic Church	No		Unevaluated		A likely significant property <sup>4</sup>
100-04-003A	150 W Dale Ave	Nordstrom & Associates	No		Unevaluated		
100-04-016	409 W Humphrey's St	Ameriprise Financial	No		Unevaluated		
100-04-015A	211 W Elm Avenue	Foot Care Specialist	Yes	North End Residential District	Noncontributing		Modern
100-03-001	503 N Humphrey's St	Josephine's Bistro	Yes	North End Residential District Inv. No. 5-52	Contributor (A, B, C)	Yes	
100-03-010	504 N Humphrey's St	High Country Dentistry	Yes	North End Residential District	Noncontributing		Postdates 1935



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report



Parcel No.	Address	Property Name	Previously Inventoried/ Documented	Previous Project <sup>1</sup>	Eligibility Status <sup>2</sup>	Section 4f Resource	Comments
100-03-011	508 N Humphrey's St	Raptor Ranch	Yes	North End Residential District	Noncontributing		Modern
100-03-005A	507 N Humphrey's St	Salvation Army	No		Unevaluated		
100-03-012	510 N Humphrey's St	CBC Advisors	No		Unevaluated		
100-03-013	516 N Humphrey's St	Lululemon Athletica	No		Unevaluated		
100-03-014A	119 W Fine Ave	Edward Jones Financial	No		Unevaluated		
101-07-015E	601 N Humphrey's St	Sky Engineering	No		Unevaluated		
101-07-015A	609 N Humphrey's St	Residence	No		Unevaluated		
101-07-008	612 N Humphrey's St	Residence	No		Unevaluated		
101-07-011B	621 N Humphrey's St	Residence	No		Unevaluated		
101-06-007	708 N Humphrey's St	Residence	No		Unevaluated		
101-06-015	709 N Humphrey's St	Residence	No		Unevaluated		
101-06-014	711 N Humphrey's St	Residence	No		Unevaluated		
101-06-008	712 N Humphrey's St	Residence	No		Unevaluated		
101-03-016B	204 W Sullivan Ave	Ski Haus Rental	No		Unevaluated		
101-03-007C	804 N Humphrey's St	Residence	No		Unevaluated		
101-03-008	808 N Humphrey's St	Residence	No		Unevaluated		



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report



Parcel No.	Address	Property Name	Previously Inventoried/ Documented	Previous Project <sup>1</sup>	Eligibility Status <sup>2</sup>	Section 4f Resource	Comments
101-03-015	809 N Humphrey's St	Flagstaff Clinic of Naturopathic Medicine	No		Unevaluated		
101-03-009	810 N Humphrey's St	Residence	No		Unevaluated		
101-03-014	811 N Humphrey's St	Residence	No		Unevaluated		
101-03013	817 N Humphrey's St	Residence	No		Unevaluated		
101-03-029	120 W Columbus Ave	Residences (rentals)	No		Unevaluated		
101-03-031E	250 W Columbus Ave	Service Station	No		Unevaluated		
Multiple Residential Properties		Mountain View	No		Unevaluated		Potential historic residential districts
		Mountain View Additional Lots	No				
		Kaibab Plaza Unit 1	No				
		Kaibab Plaza Unit 2	No				
		Kaibab Plaza Unit 3	No				
		Antelope Valley Unit 1	No				
		Antelope Valley Unit 2	No				
		Antelope Valley Unit 3	No				
		Coconino Estates Plat 1	No				
		Coconino Estates Plat 2	No				
		Mt Elden Addition	No				
102-08-001	1404 N Fort Valley Rd	Residence	No		Unevaluated		
102-07-001A	1800 N Fort Valley Rd	Café (Service Station)	No		Unevaluated		



# US 180 CORRIDOR MASTER PLAN

Working Paper #1 – Current & Future Conditions Report



Parcel No.	Address	Property Name	Previously Inventoried/ Documented	Previous Project <sup>1</sup>	Eligibility Status <sup>2</sup>	Section 4f Resource	Comments
102-02-056A	2230 N Fort Valley Rd	Elementary School	No		Unevaluated		
102-02-002A	2340 N Fort Valley Rd	Pioneer Museum / Arizona Historical Society	Yes	Flagstaff Multiple Resource Area (MRA)	National Register Listed (A,C)	Yes	
102-02-055							
111-01-006C	3100 N Fort Valley Rd	Museum of Northern Arizona (McMillan Homestead )		See below <sup>3</sup>		Yes	Homestead is listed on the local register as a landmark <sup>4</sup>
111-01-001F	3101 N Fort Valley Rd						
300-45-013B	5205 N Fort Valley Rd	Residence	No		Unevaluated		
300-45-013D	3185 Hidden Valley Rd	Residence	No		Unevaluated		

<sup>1</sup> Route 66 Survey: (Motley Design Group 2012) | Flagstaff Townsite Residential Historic District (Woodward and Stein 1985) | North End Residential Historic District (Woodward et al. 1985) | USFS Fort Valley Experimental Forest Station Historic District (Olberding 1998) | Flagstaff MRA (Woodward 1985)

<sup>2</sup> Ind. Eligible. = Individually eligible | Contributor = Contributor to an eligible district | Noncontributing = Not eligible as a contributor to a historic district.

<sup>3</sup> The McMillan Homestead was individually listed in the National Register under Criterion C and is currently owned by the Museum of Northern Arizona (MNA). The MNA is an extensive property that encompasses additional historical buildings and structures that are yet to be evaluated either individually, or as a potential historic district.

<sup>4</sup> Karl Eberhard personal communication, October 25, 2017



## CHAPTER 9: CONSIDERATION OF EXISTING AND NEWLY DEVELOPED ALTERNATIVES

### Identifying Existing Alternatives to Date

A Project Partners directive identified at the onset of this study process was to obtain a clearer understanding of the existing “universe of alternatives” from previously prepared reports and to develop new possible alternatives for consideration for the US 180 CMP process.

The first step in evaluating and defining the existing alternatives was a thorough review of the 2012 US 180 Winter Traffic Study. The *US 180 Winter Traffic Study* was prepared in response to increased congestion on US 180 as the primary route to ski and snow play areas, especially during long holiday weekends. On the six to eight holiday weekend evenings each year, visitors leaving the ski areas and snow play areas bring southbound travel to a virtual standstill on US 180. Business and resort operators worried that the delays from the extreme congestion will discourage repeat ski and snow play visitors and have a long-term impact on the Flagstaff tourist economy.

This Plan was developed to identify near-, mid- and long-term strategies to reduce winter traffic congestion on US 180 listed in **Table 9-1**.

**Table 9-1: US 180 Winter Traffic Study Strategies**

Priority	Strategy	Description	Time Frame
<b>Near-Term Strategies</b>			
1	Traffic Signal Timing	Add green signal time on southbound Milton Road at Butler Avenue and Route 66.	Tested in November, 2011, and implemented for 2011-2012 winter season
2	Traveler Information System	Provide travel time information to U.S. 180 travelers	Within five years
3	Traffic Signing Plan	Guide signs showing alternate routes and travel times; additional safety signing	Within five years
4	Early Departure Incentives	Coupons for local restaurants to encourage early departure	Within five years
<b>Mid-Term Strategies</b>			
5	Dispersed Snow Play Sites	New snow play sites outside the U.S. 180 corridor	5 to 10 years
6	Transit	New transit service to Snowbowl and Wing Mountain Snow Play Area	5 to 10 years
7	Managed Lane	Humphreys Street center left turn lane managed to accommodate southbound/ eastbound traffic	5 to 10 years
<b>Long-Term Strategies</b>			
8	New Road Capacity	Add capacity to corridor through either widening existing corridors or constructing a new road	10 to 20 years

Source: FMPO U.S. 180 Winter Traffic Study, HDT 2006

Building upon the foundation of alternatives derived from the US 180 Winter Traffic Study, the Project Partners aided the Study Team in contributing additional alternatives for consideration for this US 180 CMP study. This “Universe of Existing Alternatives” matrix as it became known as, was introduced and vetted with the Project Partners.



## Creation of Additional Alternatives for Consideration

Once the “Universe of Existing Alternatives” was completed, the Study Team and Project Partners collaboratively developed an additional list of “newly introduced alternatives”. The Study Team developed a listing of newly introduced alternatives for Project Partner consideration. These alternatives are described and depicted in greater on **Table 9-2**.

**Table 9-2: US 180 CMP Universe of Existing Alternatives**

Alternative Alignments	Operations	Added Road Capacity/Managed Lanes	Policy Recommendations	Low Investment Spot/Segment/Intersection Improvements
Columbus - Switzer Canyon Drive - Route 66	Stagger arrival and departure times (1/2 day morning pass)	4 General Purpose lanes, center median, and bike lane/shoulder	Winter Recreation Parking Pass	Roundabout at Intersection of Snow Bowl Road and US 180
Columbus - Switzer Canyon - Beaver Street - Butler Ave.	Optimization of green light PM peak on southbound Milton Road at Butler Ave. and south Route 66	Center turn lane on Humphrey's Street managed for southbound PM peak, or carpool designation, or transit dedication	Dispersed snow play sites - Ft. Tuthill, McMillan Mesa; Flagstaff Winter Advisory Task Force identifying suitable sites	Intersection Improvements - Freeman Street/US 180 intersection improvements (been a study; no warrant), Meade Lane and Forest Ave.
Forest Ave - Turquoise Dr. - Switzer Canyon - Route 66	City of Flagstaff and ADOT link signal coordination	Center lane on US 180 managed as a travel lane reversed for AM and PM peaks (South of Meade Lane to Downtown only).	Add reduce or eliminate public parking up at Snow Bowl, Nordic center and Wing Mountain	Cherry, Elm and Hunt to provide Intersection improvements
Forest Ave. - San Francisco St. - Butler Ave.	Traveler Information System - travel time estimates on variable message signs at Snow Bowl, Snow Play Areas, and I-17	Turn Humphreys into a one direction north bound or south bound for AM and PM peaks during large snow event weekends. Add an eastbound right turn lane between Humphreys and Beaver on Columbus to facilitate additional southbound traffic. At the intersection of SR-40B there would be two lanes turning southbound Milton and two lanes turning westbound SR-40B.	No Build Option (maintain as is)	Dual southbound right turn from Humphrey's to southbound Milton Road
Cable Propelled Gondola - from Downtown to Snow Bowl Rd.	Overall traffic signage improvements			
Milton Rd.; Route 66; Flagstaff Ranch Road; I-40; I-17	Adaptive signal control for all ADOT routes within the City			
Lone Tree Road (assuming T1 at I-40 and connection to Route 66)	Access Management (Turn Lanes on warranted rural US180 Intersections / Access Controls on Humphreys)			
Mike's Pike/ overpass/Humphreys one way NB and Kendrick St./Stigraewer/overpass to Milton Rd. one way SB				
Milton Rd.; Route 66; Woodland's Village Blvd.; Beulah Blvd; John Wesley Powell Blvd./I-17				
Bader Road-FS 518/581 - A-1 Mountain Road - I-40 Exit 190				
Snow Bowl Road - A-1 Mountain Road				

A total of 35 potential projects that spanned a wide variety of project types, such as; alternative alignments, managed lanes, transit, added road capacity, policy recommendations and intersection improvements were documents and vetted by the Project Partners.

## Evolution of the Universe of Alternatives to System Alternatives and Base Build Spot Improvements

As the Project Partners began to review that information in greater detail, it was generally felt that the information was useful from a technical point of view, but due to the sheer number and variation of project types, the approach was likely going to be difficult to manage, equitably evaluate and rank alternatives. It was also felt that this approach would be confusing in describing the interrelationship of these diverse alternatives to the general public.

For these reasons, the Project Partners identified the need and desire to streamline and simplify the various existing and newly introduced alternatives by “bundling” them into a more manageable set of “System Alternatives” and “Base Build Spot Improvements”. These new set of alternatives are derived from the previous “Universe of Alternatives” tables and will enable a more straight-forward presentation of the alternatives and ability for the Project Partners, stakeholders and public to equitably compare, rank and prioritize these alternatives.



“Preliminary System Alternatives” include the previously described alternative routes and added road capacity/managed lanes. “Base Build Spot Improvements” include the previously described low investment/spot improvements. The idea is that the “Preliminary System Alternatives” will be presented for comparison and ranking to the public (including cross-sections graphically depicting the facilities). Preliminary System Alternatives that receive the most favorable feedback or consensus from the public and interested stakeholders will proceed forward as “Preferred System Alternatives” for a more detailed technical and quantitative analysis and ranking.

The intent of the “Base Build Spot Improvements” is that these type of improvements, regardless of which System Alternative is ultimately selected, will likely be necessary in the short term to support the longer-term System Alternative improvements. As such, the listing of Base Build Spot Improvements will evolve as the System Alternative becomes more refined as the process moves forward.

## Preliminary System Alternatives

As **Table 9-3** shows, there are three categories of Preliminary System Alternatives for US 180 CMP consideration. These are; 1) Preliminary System Alternatives that utilize the existing right of way. 2) Preliminary System Alternatives that require and expanded right of way, and 3) Preliminary Alternative Routes.

**Table 9-3: US 180 Preliminary System Alternatives**

PRELIMINARY SYSTEM ALTERNATIVES	
Within Existing Right-of-Way	
1.	No Build Option (maintain as is)
2.	Humphrey’s Street Southbound PM Peak Managed Lane (Reversible Center Lane)
Added Capacity/Managed Lanes	
3.	Four General Purpose Lanes (GP), Center Median, Bike Lanes and Shoulders on both Sides
4.	US 180 AM and PM Peak Managed Lane from Meade Street south to Downtown (Reversible Center Lane)
5.	Humphrey’s Street One Way Northbound for AM Peak & One Way Southbound for PM Peak, and right turn capacity at Beaver Street and Columbus, and Humphrey’s Street and SR 40B
6.	Dynamic Southbound Shoulder (North of Forest Avenue)
Alternative Routes	
7.	Columbus Avenue to Switzer Canyon Drive to Route 66
8.	Columbus Avenue to Beaver Street to Butler Avenue, (Southbound One Way) & Butler Avenue to San Francisco Street to Columbus Drive (Northbound One Way)
9.	Forest Avenue to Turquoise Drive to Switzer Canyon Drive to Route 66
10.	Cable Propelled Gondola - from downtown to Snow Bowl Rd
11.	Milton Road to West Route 66 to Flagstaff Ranch Road to I-40





12. Lone Tree Road (assuming TI at I-40 and connection to Route 66)
13. Mike’s Pike Street to a Future Overpass to Humphrey’s Street one-way northbound (AM Peak) & Kendrick Street to Sitgreaves Street to existing underpass to Milton Road southbound (PM Peak)
14. Milton Road to West Route 66 to Woodland’s Village Boulevard to Beulah Boulevard to John Wesley Powell Boulevard to I-17 South
15. Bader Road to FS 518 to A-1 Mountain Road to I-40
16. Snow Bowl Road to A-1 Mountain Road to I-40
17. Wing Mountain Road to FS Road 222 to FS Road 111
18. Hidden Hollow Road to FS 506 to Route 66 to I-40

It should be noted that the Preliminary System Alternatives described below are conceptual in nature and are intended to represent a variety of possible approaches to mitigate traffic congestion of US 180. Variations of each alternative could be considered based on the context, character and specific design measures of any particular road segment within the broader study corridor. Each of these Preliminary System Alternatives will be reviewed and discussed by the Project Partners and interested stakeholders to gauge the community acceptance or preference for these preliminary, conceptual System Alternatives. The Preliminary System Alternatives that receive the most supportive interest and/or input from Project Partners and interested stakeholders will proceed forward as Preferred System Alternatives that will receive additional technical evaluation and traffic modeling analysis in order to quantitatively determine the operational efficiency, safety and performance of each Preferred Alternative.

For each of the Preliminary System Alternatives presented below, additional considerations for access management, safety and signal timing require additional traffic modeling and design considerations and analysis should the alternative receive future consideration moving forward.

Each of the Preliminary System Alternatives are described and depicted below.

### Preliminary System Alternatives Utilizing Existing Right of Way

#### 1. No Build (maintain as is)

A “No Build” option is identified for consideration and future ranking/prioritization. The “No Build” options favors maintaining the existing US 180 right of way and facilities “as is”. The No Build alternative is important for public and stakeholder consideration. It also meets FHWA and ADOT Planning and Environmental Linkages (PEL) guidance (further explained in Chapter 7) for certain planning studies and helps facilitate environmental studies should future implementation projects present themselves for consideration.

#### 2. Humphrey’s Street Southbound PM Peak Managed Lane (Reversible Center Lane)

A “Reversible Lane” as the name implies, is a concept in which the center traffic lane (turn lane) may travel in either direction (however just southbound traffic only in this System Alternative), depending upon the time, day and/or operation sign/signal displayed. Reversible traffic lanes add capacity to a road and decrease congestion by borrowing capacity from the other (off-peak) direction. This holds especially



true in situations where options for expanding the existing right of way are limited (existing right-of-way on Humphrey’s Street is 50 feet) or when traffic in the corridor is heavily imbalanced for a short period of time such as leading to/from a special event (snow play). This alternative is illustrated in **Figure 9-1** and **Figure 9-2**. It is important to note that this alternative would only be implemented along the US 180 corridor on Humphrey’s Street between Columbus Avenue and Historic Route 66.

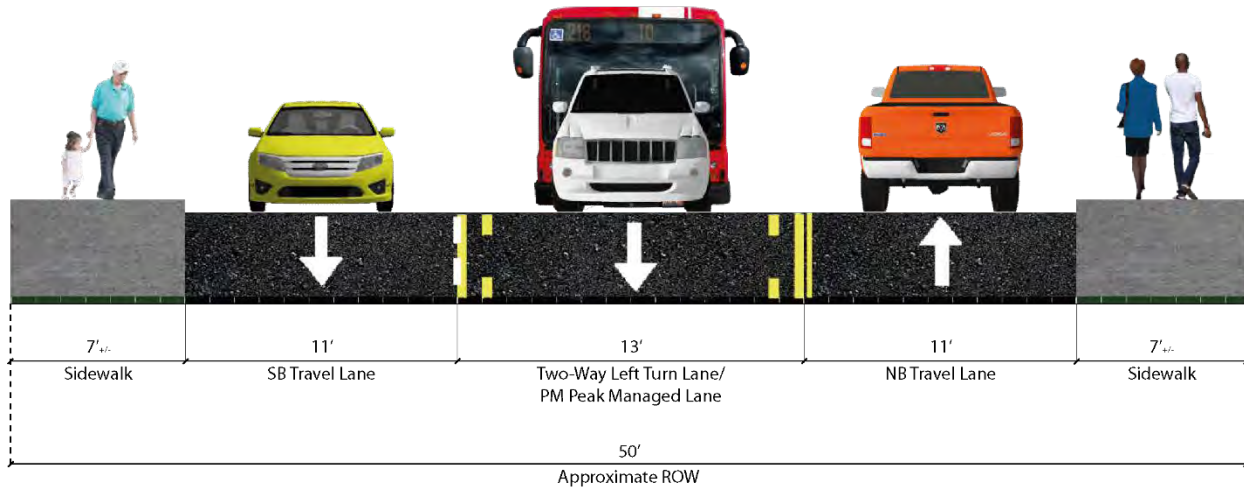
The concept is often referred to by FHWA and transportation professionals, as “managed lanes” in that high demand on existing facilities, such as US 180/Humphrey’s Street, especially at peak demands are placed on the roadway, it necessitates the efficient management of those facilities.

There are a wide variety and combination of approaches to managed lane operations. These have typically encompassed such methods as:

- Static signing and striping
- Changeable message signs
- Lane control signals
- Temporary traffic control devices
- Law enforcement / legal restrictions
- Economic incentives / disincentives

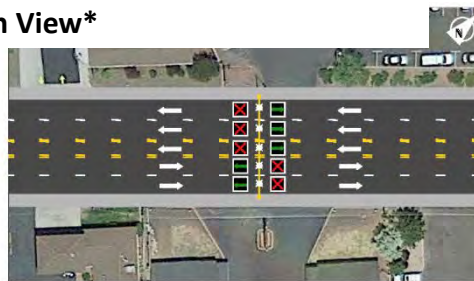


**Figure 9-1: US 180 System Alternative 2 Cross-Section\***

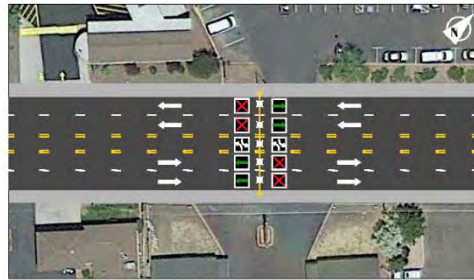


**Figure 9-2: US 180 System Alternative 2 Plan View\***

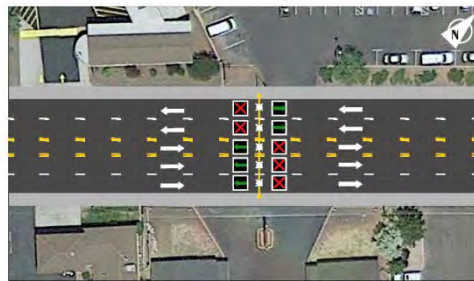
**AM Peak Period  
 Traffic Designation**



**Mid-Day / Standard  
 Traffic Designation**



**PM peak Period  
 Traffic Designation**



*\*Detailed traffic studies are necessary to apply this concept to any arterial/highway such as US 180 to address matters safety, access management (especially with the high number of existing driveways) and multimodal considerations.*



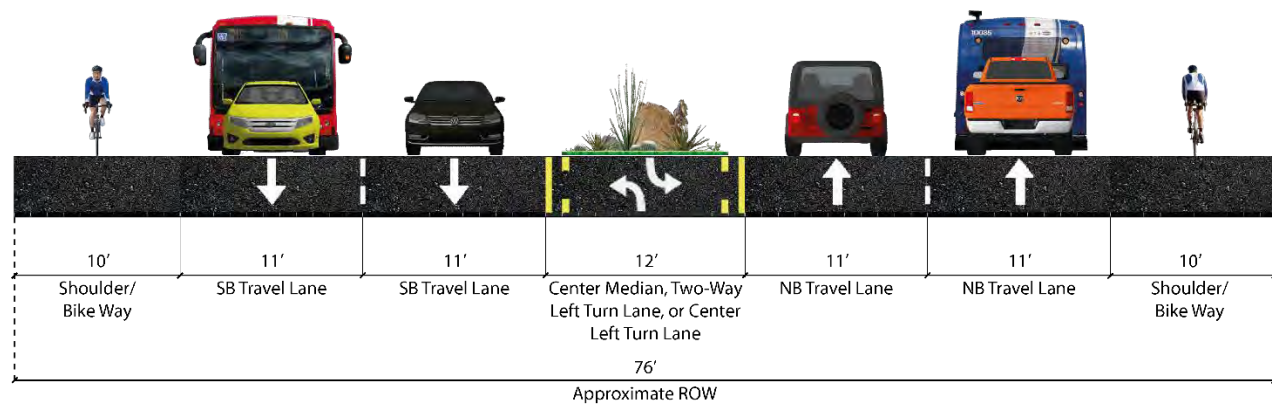
## Preliminary System Alternatives Requiring Expanded Right-of-Way

Note: Per the Road Configuration Inventory presented in the US 180 Winter Traffic Study, the existing right-of-way for US 180 varies from 50-feet to 100 feet, depending on roadway segment. The majority of road segments for US 180 average 65-80 feet in width. As such, it is assumed that the System Alternatives presented below will require some level of additional right of way expansion.

### 3. Four General Purpose Lanes, Center Median, Bike Lanes and Shoulders on both Sides

As Figure 9-3 illustrates, this Preliminary System Alternative calls for four (4), 11-foot general purpose travel lanes, a 12-foot center turn lane (two-way left turn lane) and two, 10-foot shoulders that also may be utilized as bikeways. Each of the outside general purpose lanes would accommodate buses, vehicles and right turning movements. Landscaping setbacks are not included in this alternative. This alternative adds vehicular capacity to existing US 180 by adding two additional general purpose lanes (one south-bound, one north-bound) that do not currently exist. It is suggested that sidewalks be maintained where they currently exist today on both sides of US 180 (generally) from Beal Road to Columbus Avenue. The FUTS would also be maintained on the south side of US 180 as a protected (by the guard rail) shared use path.

Figure 9-3: US 180 System Alternative 3 Cross-Section



### 4. US 180 AM and PM Peak Managed Lane from Meade Street south to Downtown (Reversible Center Lane)

This Preliminary System Alternative that proposes a managed lane for the US 180 roadway segment that experiences congestion issues in the most “urban” segments of US 180 adjacent to residential neighborhoods at the gateway to downtown Flagstaff. From Meade Lane to Anderson Avenue, 90 feet of right-of-way currently exists. From Anderson Avenue to Forest Avenue, 65 feet of right-of-way exists. As a proposed “urban roadway section”, this System Alternative proposes to include sidewalks on both sides, bike lanes on both sides and maintain the FUTS on the south side of the roadway. In some locations, some or all of these facilities exist (for this roadway segment), in some cases they do not. For



purposes of this Preliminary System Alternative, a “complete street” that provides for all modes is identified.

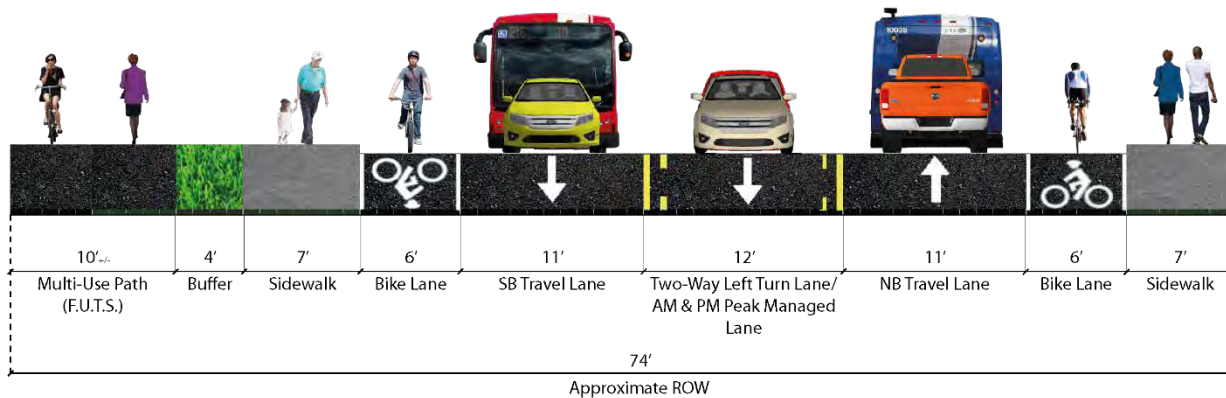
A “Reversible Lane” as the name implies, is a concept in which the middle traffic lane may travel in either direction, depending upon the time, day and/or operation sign/signal displayed. Reversible traffic lanes add capacity to a road and decrease congestion by borrowing capacity from the other (off-peak) direction. This holds especially true in situations where options for expanding the existing right of way are limited (existing right-of-way on Humphrey’s Street is 50 feet) or when traffic in the corridor is heavily imbalanced for a short period of time such as leading to/from a special event.

The concept is often referred to by FHWA and transportation professionals, as “managed lanes” in that high demand on existing facilities, such as US 180, especially at peak demands are placed on the roadway, it necessitates the efficient management of those facilities. This alternative is displayed in **Figure 9-4.**

There are a wide variety and combination of approaches to managed lane operations. These have typically encompassed such methods as:

- Static signing and striping
- Changeable message signs
- Lane Controls
- Temporary traffic control devices
- Law enforcement / legal restrictions
- Economic incentives / disincentives

**Figure 9-4: US 180 System Alternative 4 Cross-Section\***



*\*Detailed traffic studies are necessary to apply this concept to any arterial/highway such as US 180 to address matters safety, access management (especially with the high number of existing driveways) and multimodal considerations.*

## 5. Humphrey’s Street One Way Northbound for AM Peak & One Way Southbound for PM Peak, and right turn capacity at Beaver Street and Columbus, and Humphrey’s Street and SR 40B

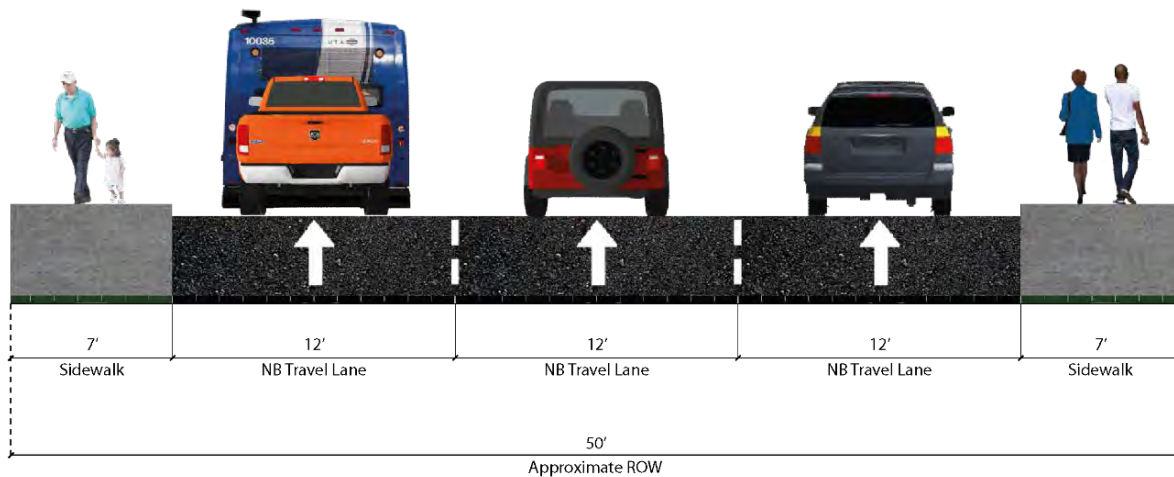
This Preliminary System Alternative calls for Humphrey’s Street between Business 40 and Columbus Street to convert both general purpose lanes and center turn lane into one-way directional traffic flows – northbound for the AM peak and southbound for the PM peak.

An eastbound right turn lane on Columbus to Beaver Street is suggested to complement this alternative by helping mitigate southbound PM peak volumes as an alternative to Humphrey’s Street. Two southbound right turn lanes to west bound Business 40 is also suggested. **Figure 9-5** depicts the northbound AM peak condition only.

There are a wide variety and combination of approaches to managed lane operations. These have typically encompassed such methods as:

- Static signing and striping
- Changeable message signs
- Lane control signals
- Temporary traffic control devices
- Law enforcement / legal restrictions
- Economic incentives / disincentives

**Figure 9-5: US 180 System Alternative 5 Cross-Section\***



*\*Detailed traffic studies are necessary to apply this concept to any arterial/highway such as US 180 to address matters safety, access management (especially with the high number of existing driveways) and multimodal considerations.*

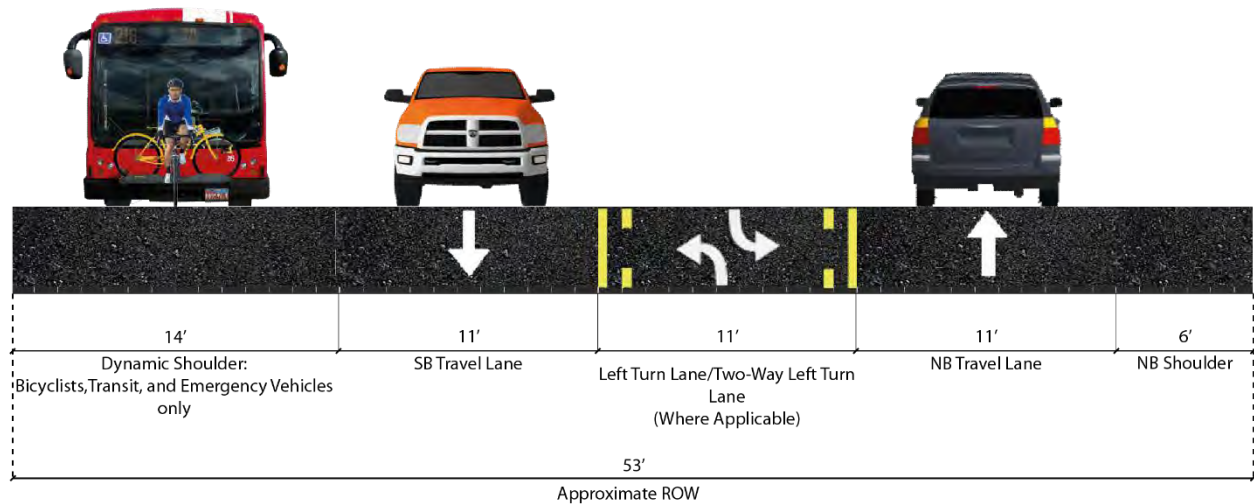
## 6. Dynamic Southbound Shoulder

System Alternative 6 would generally have minimal impact and does not require substantial amounts of additional right-of-way. Similar to a typical roadway shoulder, the dynamic shoulder would allow the use of pedestrians and bicyclists; but what separates the dynamic shoulder from a standard shoulder is during winter peak traffic congestion, the dynamic shoulder would support the use of transit and emergency vehicles to bypass vehicle congestion on US 180 general purpose lanes. However,



pedestrians and bicyclists traversing on the shoulder would have to yield to both emergency and transit vehicles. Signage would need to be placed at appropriate intervals that would indicate the south bound shoulder is only permitted to non-motorized travel, and emergency and transit vehicles during winter peak traffic congestion. **Figure 9-6** is a graphic representation of System Alternative 6 during winter peak traffic.

**Figure 9-6: US 180 System Alternative 6 Cross Section**



## Alternate Routes to US 180

Alternative Route Preliminary System Alternatives are intended to explore other potential roadway corridor options besides US 180 itself for establishing supportive routes to disperse peak volumes and potentially reducing traffic congestion on US 180. US 180 serves as the primary roadway corridor to and from the snow recreation areas in the Flagstaff area. There are however, a series of possible alternative routes that are contemplated to redirect traffic at select segments of existing and future planned roadways. The US 180 Alternative Routes are depicted in **Figure 9-7** and include:

- Columbus Avenue to Switzer Canyon Drive to Route 66,
- Columbus Avenue to Beaver Street to Butler Avenue (Southbound One Way) & Butler Avenue to San Francisco Street to Columbus Drive,
- Forest Avenue to Turquoise Drive to Switzer Canyon Drive to Route 66,
- Cable Propelled Gondola,
- Milton Road to West Route 66 to Flagstaff Ranch Road to I-40,
- Lone Tree Road,
- Mike's Pike Street/Future Overpass/Humphrey's Street one way northbound & Kendrick Street/Sitgreaves Street/existing underpass to Milton Road southbound,
- Milton Road to West Route 66 to Woodland's Village Boulevard to Beulah Boulevard to John Wesley Powell Boulevard to I-17 South,

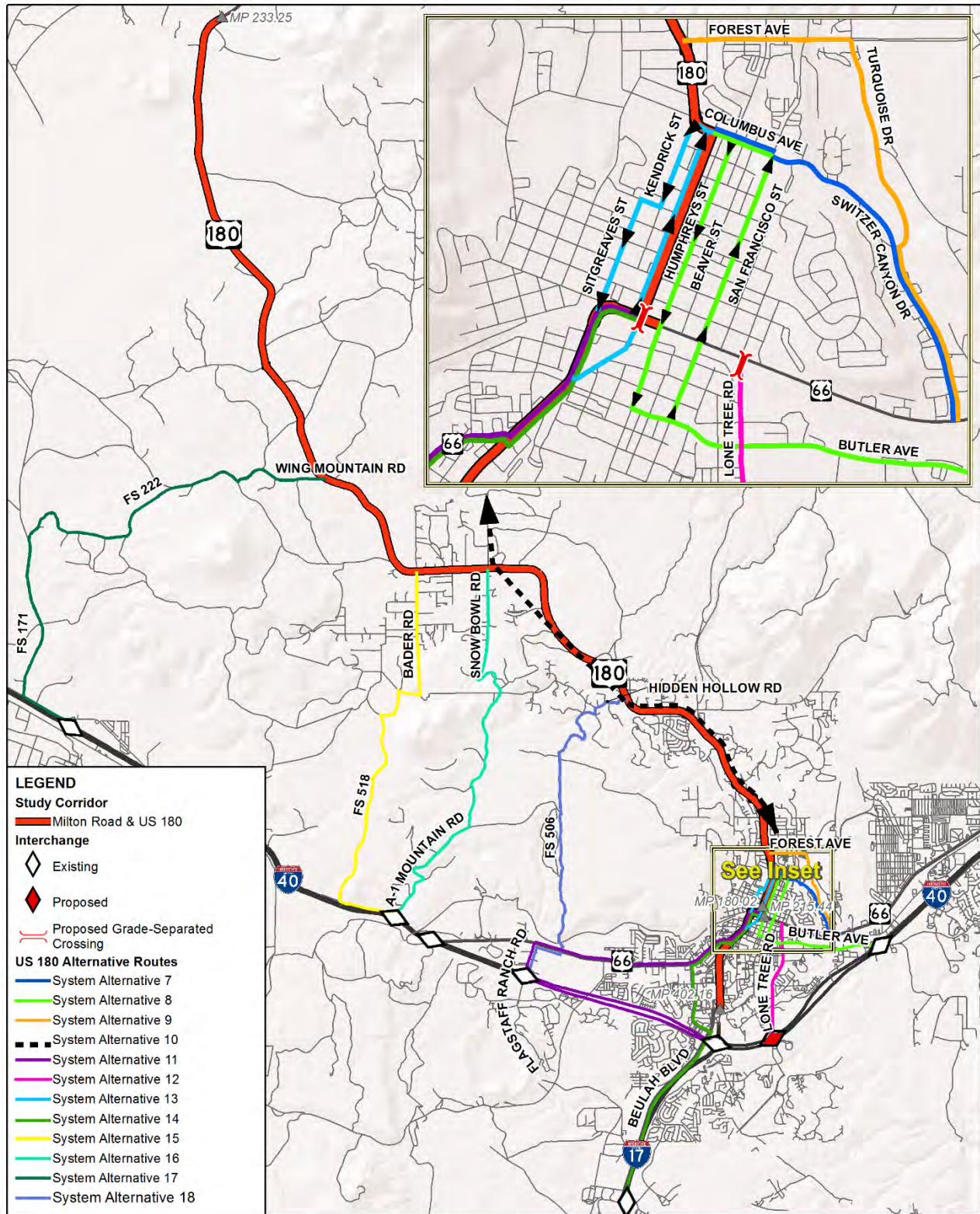


- Bader Road to FS 518 to A-1 Mountain Road to I-40,
- Snow Bowl Road to A-1 Mountain Road to I-40, and
- Wing Mountain Road to FS Road 222 to FS Road 111.





Figure 9-7: US 180 Alternative Routes



## 7. Columbus Avenue to Switzer Canyon Drive to Route 66

As **Figure 9-8** shows, this Preliminary Alternate route would focus upon travelers utilizing Columbus Avenue to Switzer Canyon Drive to Route 66 as an alternative to avoiding the typical congestion occurring on Humphrey’s Street. Columbus Avenue and Switzer Canyon Drive are three-lane collector roadways that consist of two general purpose lanes and a center turn lane except for the southern segment of Switzer Canyon from Turquoise Drive to Route 66 which is a two-lane collector roadway with no center turn lane. Intersection management at Columbus Avenue and US 180/Humphrey’s Street will be a major component to this alternative route.

This Preliminary Alternative Route would primarily benefit the winter recreation PM peak southbound traffic. Travelers with southern destinations (Phoenix/Tucson) could proceed east on Route 66 to Ponderosa Parkway, then to Butler Avenue and its interchange with I-40 west to then proceed to I-17 south.

**Figure 9-8: US 180 System Alternative 7**



## 8. Columbus Avenue to Beaver Street to Butler Avenue, (Southbound One Way) & Butler Avenue to San Francisco Street to Columbus Drive (Northbound One Way)

As **Figure 9-9** shows, this Preliminary System Alternate Route would focus upon southbound US 180 PM peak vehicles by utilizing Columbus Avenue to Beaver Street (southbound only directional flows). Beaver Street currently has an at-grade crossing of the BNSF railway mainline and continues to its intersection with Butler Avenue. Vehicles could opt to turn west on Butler to intersect with Milton, but would likely prefer to travel east on Butler Avenue to the I-40 interchange in order to avoid the southbound PM peak congestion on Milton Road. Intersection management at Columbus Avenue and US 180/Humphrey’s Street will be a major component to this alternative route.

Columbus Avenue is three-lane collector roadway that consists of two general purpose lanes and a center turn lane. There is no dedicated right turn onto southbound Beaver Street and the lack of distance and minimal stacking depth from the Humphrey’s Street intersection is a constraint. Beaver Street is a two-lane, one-way southbound roadway with on street parking in a downtown, pedestrian scale setting that also possess a likely constraint to this alternative route.

The northbound AM Peak direction would propose Butler Street to San Francisco Street (at grade crossing of the BNSF railway mainline) to westbound Columbus Drive. San Francisco Street is a two-lane roadway with on street parking in a downtown, pedestrian scale setting like Beaver Street, which likely possess a constraint to a safe and comfortable carrying capacity of high vehicle volumes. San Francisco Street does possess moderate to generous west bound turning movement storage onto westbound Columbus Street.

**Figure 9-9: US 180 System Alternative 8**

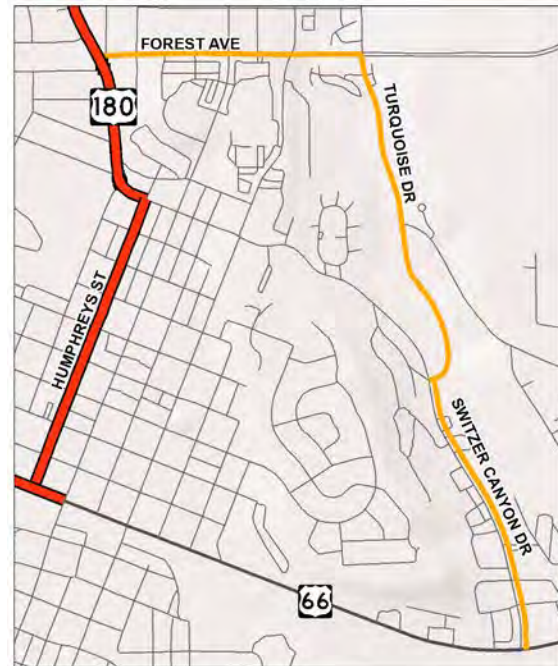


## 9. Forest Avenue to Turquoise Drive to Switzer Canyon Drive to Route 66

This Preliminary System Alternate Route (Figure 9-10) could possibly assist AM peak northbound and PM peak southbound vehicles, though the route is a bit more circuitous in nature. Southbound US 180 does have a dedicated left turn lane at Forest Avenue with moderate storage. Forest Avenue is a three-lane collector roadway that consists of two general purpose lanes and a center turn lane with bike lanes on both sides of the roadway to its intersection with San Francisco Street. Forest Avenue does have fairly steep grades in areas that may pose safety concerns in winter conditions. From San Francisco Street east to Turquoise Drive, Forest Avenue is a five-lane facility with four general purpose lanes and a center turn lane. Forest Avenue serves as the primary access to the Flagstaff Medical Center and single family residential homes to the north.

Turquoise Drive is a low volume two-lane facility serving mostly single family residential uses and has sweeping radius at its southern terminus leading to its intersection with Switzer Canyon Drive. The southbound left turn lane has little to moderate storage capacity. Switzer Canyon Drive from Turquoise Drive to Route 66 is a two-lane collector roadway with no center turn lane.

Figure 9-10: US 180 System Alternative 9



## 10. Cable Propelled Gondola

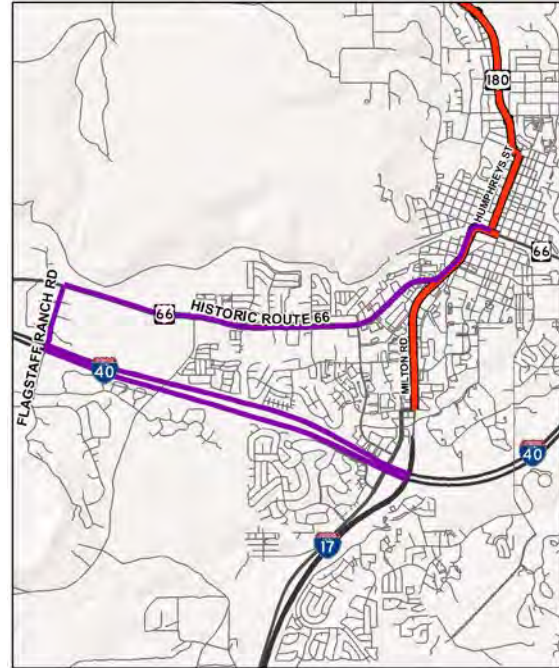
High speed gondolas are used in some ski resort towns in the United States and abroad to alleviate winter recreation congestion. Conceptually, a gondola system for Flagstaff's winter recreation needs would connect downtown to Snow Bowl. The cable propelled gondola was initially identified as a possible long-term alternative in the US 180 Winter Traffic Study. The study notes that more detailed studies would be necessary to explore the economic cost effectiveness and environmental practicality of a gondola system with respect to its potential to be situated in proximity to the environmentally and culturally sensitive Kachina Peaks Wilderness Area. Project Partners had a discussion about the complexity and sensitivity of the cable propelled gondola and all agreed to eliminate this preliminary alternative from consideration in the US 180 CMP.

## 11. Milton Road to West Route 66 to Flagstaff Ranch Road to I-40

Intended to partially alleviate the winter recreation southbound PM peak, this Preliminary System Alternate Route would divert southbound PM peak vehicles off Milton Road to West Route 66. The southbound approach to West Route 66 does have a dedicated right turn lane with approximately 250 feet of storage. Vehicles would travel for three miles west on West Route 66 to Flagstaff Ranch Road. West Route 66 is a five-lane roadway with four general purpose lanes and a center turn lane from Milton Road to Pinnacle Street where the roadway narrows to one west bound lane, two eastbound lanes and a center turn lane to its intersection with Woodland’s Village Boulevard. West of Woodland’s Village Boulevard, West Route 66 again narrows to a three-lane roadway that includes two general purpose lanes and a center turn lane.

Flagstaff Ranch Road offers full traffic interchange access to I-40 where the majority of winter recreation vehicles likely will continue approximately 2.75 miles to I-17 South. Please see **Figure 9-11** for an illustration of this Preliminary Alternate alignment.

**Figure 9-11: US 180 System Alternative 11**



## 12. Lone Tree Road (assuming TI at I-40 and connection to Route 66)

This Preliminary System Alternate Route would focus upon the use and potential expansion of Lone Tree Road to provide supplemental capacity to Milton Road. Currently, Lone Tree Road is located approximately ¼ of a mile due east of Milton Road and is generally a two-lane collector roadway that primarily serves access for local destinations. The Flagstaff Regional Plan calls for Lone Tree Road to ultimately connect JW Powell Boulevard and downtown Flagstaff.

The Lone Tree Road Corridor Study, completed in 2006, underscores the need to establish additional north-south links within the central portions of Flagstaff. However, the study also notes that significant features such as a traffic interchange to connect with I-40 and grade separated crossing of the BNSF railway mainline are instrumental facilities to enhance the local and regional effectiveness of Lone Tree Road (and therefore congestion reduction of Milton Road).

The Preferred Alternative (**Figure 9-12**) from the Lone Tree Road Corridor Study recommends a 100-foot right-of-way whose typical roadway section consists of four general purpose travel lanes (two in each direction), a raised median, on street bicycle lanes, pathways on both sides, a sidewalk on one side and a FUTS trail on one side.

**Figure 9-12: US 180 System Alternative 12**



Source: Lone Tree Corridor Study, DMJM Harris | AECOM 2006



### 13. Mike’s Pike Street to a Future Overpass to Humphrey’s Street one-way northbound (AM Peak) & Kendrick Street to Sitgreaves Street to existing underpass to Milton Road southbound (PM Peak)

This Preliminary System Alternate Route is intended to bypass the usual northbound congestion between the Milton Road curvature and BNSF underpass to the Route 66/Humphrey’s Street intersection. As shown in **Figure 9-13**, this Preliminary System Alternate Route proposes to have northbound AM Peak vehicles divert off Milton Road at Mike’s Pike Street at a northbound one-way managed lane to a future proposed overpass of the BNSF railway mainline to Humphrey’s Street. Humphrey’s Street would then utilize a managed lane concept as well to accommodate one-way AM peak flows to its intersection with Columbus Avenue.

**Figure 9-13: US 180 System Alternative 13**



The northbound leg of this Preliminary System Alternate Route would constitute a long-term solution as a proposed overpass requiring right-of-way acquisition, design and construction is needed. Detailed design studies would be necessary to evaluate the appropriateness of the overpass and the impact of its merging grade onto Humphrey’s Street with daily traffic functions of Humphrey’s Street and the surrounding land uses. Also, a traffic impact analysis to evaluate the potential use of Mike’s Pike as a one-way northbound roadway (managed lanes) for winter recreation weekends only is suggested, particularly with the ongoing and planned redevelopment activities adjacent to Mike’s Pike.

The southbound leg of this Preliminary System Alternate Route would utilize managed one-way lanes and would consist of southbound PM peak vehicles turning right onto Kendrick Street to reduce congestion on Humphrey’s Street. There would likely need to be a double southbound right turn lane on US 180 to Kendrick Street. Kendrick Street is a two-lane local street with on street parking adjacent to Flagstaff High School. The construction of mid-block crossing or a HAWK on Kendricks Street would be necessary on to insure there is a safe and controlled crossing between Flagstaff Highschool and their associated parking lot on the opposite side of Kendricks Street. Southbound vehicles would divert to Sitgreaves street via a four way stop at Elm Street, continue south on Kendrick Street to its current outlet to south Milton Road at the Santa Fe Avenue/Milton Road intersection. Sitgreaves Street is a two-lane local street with heavily utilized on street parking in a historic neighborhood which is a concern/challenge to the viability of this southbound leg. The limited storage depth of the southbound Milton Road merging lane at the underpass also warrants addition study should this Preliminary System Alternative receive further consideration in this study. In addition, the intersection of Sitgreaves Street and Route 66/Milton Road will likely need to be reconfigured to become signalized.

## 14. Milton Road to West Route 66 to Woodland’s Village Boulevard to Beulah Boulevard to John Wesley Powell Boulevard to I-17 South

Primarily intended to partially alleviate the winter recreation southbound PM peak, this Preliminary System Alternate Route (**Figure 9-14**) would divert southbound PM peak vehicles off Milton Road to West Route 66. The southbound approach to West Route 66 does have a dedicated right turn lane with approximately 250 feet of storage. Vehicles would travel for three miles west on West Route 66 to Flagstaff Ranch Road. West Route 66 is a five-lane roadway with four general purpose lanes and a center turn lane from Milton Road to Pinnacle Street where the roadway narrows to one westbound lane, two eastbound lanes and a center turn lane to its intersection with Woodland’s Village Boulevard.

Vehicles would then travel south on Woodland’s Village Boulevard for approximately one mile to Beulah Boulevard. The dedicated left turn lane from westbound Route 66 to southbound Woodland’s Village Boulevard has moderate storage depth (approximately 135-feet) and would likely require further study and extension to accommodate an increase in winter recreation PM peak volumes.

Woodland’s Village Boulevard is a four-lane divided, access controlled, collector roadway with two general purpose southbound travel lanes to Beulah Boulevard. At its approach to Beulah Boulevard, the outside general purpose lane transitions to a dedicated right turn lane to southbound Beulah Boulevard.

Avoiding the congestion on Milton Road, southbound travels remain on Beulah Boulevard approximately 2.75 miles to the JW Powell traffic interchange to I-17 south. Beulah Boulevard is primarily a two-lane roadway for the entire length of this leg of the route.

**Figure 9-14: US 180 System Alternative 14**





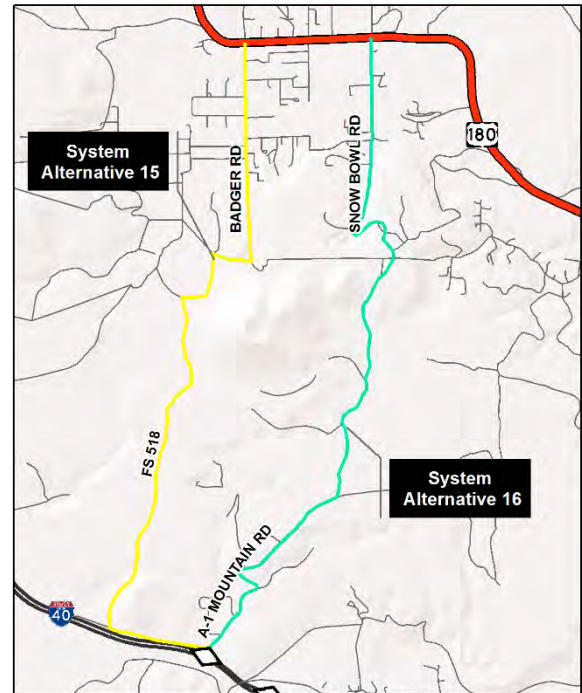
## 15. Bader Road to FS 518 to A-1 Mountain Road to I-40

As initially identified and discussed in the US 180 Winter Traffic Study, possible improvement to an existing US Forest Service road to provide a bypass to downtown Flagstaff and more direct connection between US 180 and I-40 is contemplated. Please see **Figure 9-15** for reference to the location of this Preliminary System Alternate Route. The length of this proposed route is 7.6 miles.

As noted in the US 180 Winter Traffic Study, this is a long-term solution that would require extensive coordination with Coconino County, the US Forest Service and would require federal environmental clearance. Funding sources for road improvements and maintenance would also need to be identified. Concerns about this alternative’s possible encroachment and disruption to the rural lifestyle and land use character of the Fort Valley/Baderville area is also an important consideration.

This Preliminary System Alternate Route would likely only contemplate a seasonal a temporary use of this roadway during peak winter recreation periods. Additional discussion by the Project Partners and stakeholders is needed to determine the level of roadway design for such a roadway. The US 180 Winter Traffic Study identifies a two-lane paved road section with eight foot shoulders, however other variations in design could be contemplated.

**Figure 9-15: US 180 System Alternative 15**



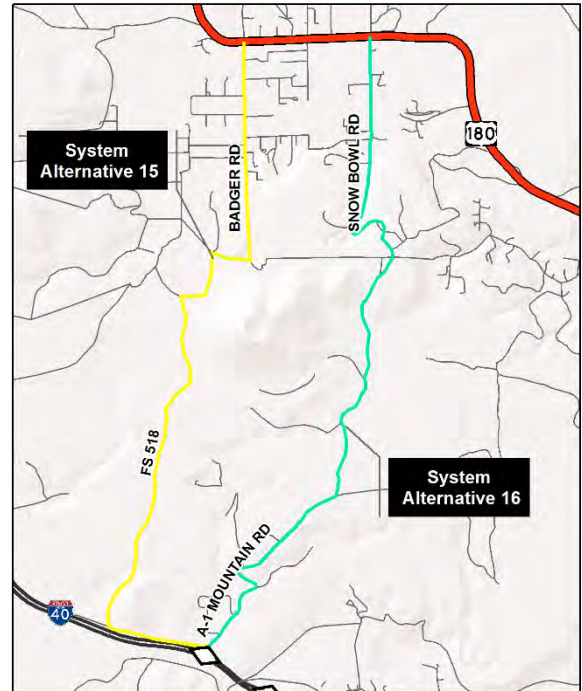
## 16. Snow Bowl Road to A-1 Mountain Road to I-40

As initially identified and discussed in the US 180 Winter Traffic Study, possible improvement to an existing Forest Service road to provide a bypass to downtown Flagstaff and more direct connection between US 180 and I-40 is contemplated. Please see **Figure 9-16** for reference to the location of this Preliminary System Alternate Route. The length of this proposed route is 7.3 miles.

As noted in the US 180 Winter Traffic Study, this is a long-term solution that would require extensive coordination with Coconino County and the Coconino National Forest and would require federal environmental clearance. The lighting options would need to be low-profile due to the proximity to the Naval Observatory. Funding sources for road improvements and maintenance would also need to be identified.

This Preliminary System Alternate Route would likely only contemplate a seasonal a temporary use of this roadway during peak winter recreation periods. Additional discussion by the Project Partners and stakeholders is needed to determine the level of roadway design for such a roadway. The US 180 Winter Traffic Study identifies a two-lane paved road section with eight foot shoulders, however other variations in design could be contemplated.

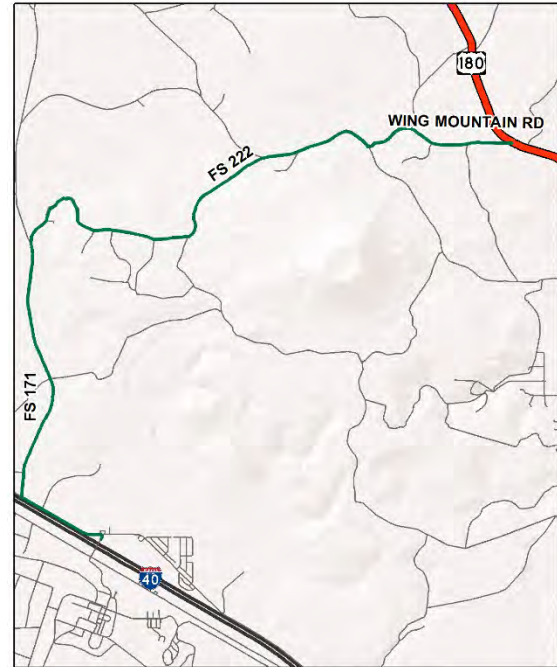
**Figure 9-16: US 180 System Alternative 16**



**17. Wing Mountain Road (FS 222B) to FS 222 to FS 171 to I-40**

System Alternatives 16 and 17 were formerly proposed by the US 180 Winter Traffic Study as alternative routes to directly connect US 180 to I-40. Local resident concerns regarding their proximity to rural residential properties off Bader Road and Snow Bowl Road has prompted the need to explore other viable alternative routes.

**Figure 9-17: US 180 System Alternative 17**



**Figure 9-17** illustrates US 180 System Alternative 17 which is 3.7 miles west of Snow Bowl Road. System Alternative 17 is a 10.3 mile connection to I-40 through Belmont, AZ utilizing the Wing Mountain access road (FS 222B) to Forest Service Roads 222 and 171.

This is a long-term solution that would require extensive coordination with Coconino County and the Coconino National Forest and would require federal environmental clearance. The lighting options would need to be low-profile due to the proximity to the Naval Observatory. Funding sources for road improvements and maintenance would also need to be identified.

This Preliminary System Alternate Route would likely only contemplate a seasonal a temporary use of this roadway during peak winter recreation periods. This alternative is longer than the other proposed alternative routes which would result in higher costs and additional coordination. Additional discussion by the Project Partners and stakeholders is needed to determine the level of roadway design.



**18. Hidden Hollow Road to FS 506 to Route 66 to I-40**

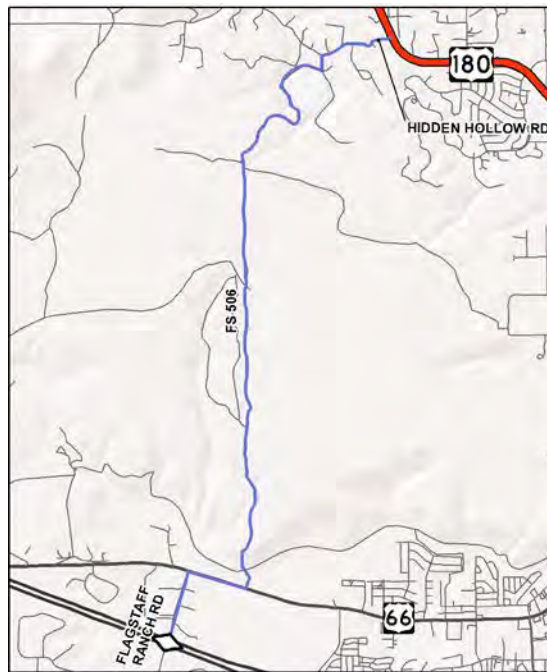
System Alternative 18, as shown in **Figure 9-18**, is a 5.5 mile alternative route that utilizes existing forest service roads to bypass Flagstaff by connecting US 180 to I-40. Travelers leaving Snow Bowl would head towards Flagstaff on US 180 and make a right turn onto Hidden Hollow Road for approximately ½ a mile to access FS 506. A southbound right turn deceleration lane on US 180 approaching Hidden Hollow Road will likely be necessary. Visitors would then travel on FS 506 for roughly four miles to run up and over Observatory Mesa to connect with Route 66 between Woody Mountain Road and Flagstaff Ranch Road before reaching I-40. This alternative does intersect with the BNSF railroad and BNSF would likely not allow an at-grade crossing, so an overpass would likely need to be constructed in order to fulfill this alternative route.

This is a long-term solution that would require extensive coordination with Coconino County and the Coconino National Forest and would require federal environmental clearance. The lighting options would need to be low-profile due to the proximity to the Naval Observatory.

Funding sources for road improvements and maintenance would also need to be identified.

This Preliminary System Alternate Route would likely only contemplate a seasonal a temporary use of this roadway during peak winter recreation periods. Additional discussion by the Project Partners and stakeholders is needed to determine the level of roadway design.

**Figure 9-18: System Alternative 18**



## References Cited

Bowler, Maggie R.

- 2012 *A Cultural Resources Survey of 59.15 Acres along US Highway 180, within and outside ADOT Right-of-way, between milepost 216.20 and milepost 224.06, in Flagstaff, Coconino County, Arizona.* Report no. AZG0907-099. AZTEC Engineering, Phoenix.

Coconino County

- 2017 Coconino County Arizona Assessor. Electronic Document, <http://www.coconino.az.gov/119/Assessor>, accessed October 11, 2017.

Federal Highway Administration, Arizona Department of Transportation, and Arizona State Historic Preservation Office

- 2002 Interim Procedures for the Treatment of Historic Roads. 15 November, 2002.

Lonardo, Cara

- 2006 *A Cultural Resources Survey of State Route 40 Business Between Mileposts 193.2 and 197.2, Flagstaff, Coconino County, Arizona.* Technical Report No. 065026. Logan Simpson Design, Tempe.

Motley Design Group, LLC

- 2012 An Historic Resource Survey of Route 66 in Arizona. Manuscript on file, Arizona State Historic Preservation Office, Phoenix.

Olberding, Susan Deaver

- 1998 *National Register of Historic Places Nomination Form: USFS Fort valley Experimental Forest Station Historic District.* Manuscript on file, Arizona State Historic Preservation Office, Phoenix.

Stone, Lyle M.

- 1985 *Cultural Resource Survey of a Proposed Highway Reconstruction Project on U.S. 89/66 (Santa Fe Avenue) in Flagstaff, Coconino County, Arizona.* ADOT Project No. M-951-6(1). Archaeological Research Services, Tempe.

U.S. Geological Survey

- 2017 USGS Earth Explorer Online Data. Electronic Document, <https://earthexplorer.usgs.gov/>, accessed August 24, 2017.

Weaver, Donald E., Jr.

- 1992 *An Archaeological Survey of 2.8 Miles of the US 180 Right-of-Way between Mileposts 220 and 222.8 Northwest of Flagstaff, Coconino County, Arizona.* Plateau Mountain Desert Research, Flagstaff.



Wilson, Majorie

1975 *National Register of Historic Places Inventory Form: The Homestead*. Manuscript on file, Arizona State Historic Preservation Office, Phoenix.

Woodward, James, and Pat Stein

1985 *National Register of Historic Places Nomination Form: Flagstaff Townsite Historic Residential District*. Manuscript on file, Arizona State Historic Preservation Office, Phoenix.

Woodward, James W.

1985 *Historic Resources of Flagstaff (Flagstaff Multiple Resource Area)*. National Register of Historic Places Nomination Form. Manuscript on file, State Historic Preservation Office, Phoenix.

Woodward, James W., Pat Stein, and Deborah House

1985 *National Register of Historic Places Nomination Form: North End Historic Residential District*. State Historic Preservation Office, Phoenix.

