



PINETOP / LAKESIDE

Celebrate the Seasons



Community Transportation Plan

September 2007

WILSON
& COMPANY

Community Transportation Plan

260



PINETOP/LAKESIDE

Celebrate the Seasons

Prepared for:

Town of Pinetop-Lakeside

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(Project Numbers: 06-100-10400; 06-100-10800)

September 2007

Table of Contents

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1-1
1.1 Study Background	1-1
1.2 Study Purpose	1-1
1.3 Pinetop-Lakeside Community Transportation Plan	1-4
2.0 EXISTING CONDITIONS	2-1
2.1 Current Socioeconomic Conditions	2-1
2.1.1 Year 2006 Population Estimate	2-1
2.1.2 Year 2006 Employment Estimate	2-1
2.1.3 Current Roadway System	2-6
2.1.4 Jurisdictional Responsibility	2-6
2.1.5 Roadway Functional Classification	2-6
2.1.6 Principal Sub-Regional Roadway Network	2-6
State Highway System	2-6
Regional/Local Road System	2-7
2.1.7 Existing Roadway Characteristics	2-7
Typical Cross-Sections	2-7
Intersection Flare	2-9
Right-of-Way Requirements	2-9
Number of Lanes	2-9
Traffic Counts	2-9
3.0 TRANSPORTATION MODEL DEVELOPMENT	3-1
4.0 SOCIOECONOMIC PROJECTIONS	4-1
4.1 Previous Plans and Studies	4-1
4.2 Population and Employment Projections	4-1
4.2.1 Population Projections	4-2
4.2.2 Employment Projections	4-2
4.2.3 Planned Developments & Land Ownership Patterns	4-2
5.0 FUTURE TRAVEL CONDITIONS	5-1
5.1 Future Roadway System	5-1
5.1.1 General Design Parameters	5-1
5.1.2 External Traffic forecasts	5-1
5.1.3 Improvement Scenarios	5-2
Existing-Plus-Committed Roadway Network	5-2
Committed-Plus-Planned Roadway Network	5-5
Alternative 'A' Roadway Network	5-9
5.1.4 Year 2015 Mid-Term Improvement Needs	5-9
5.2 Intersection Analysis	5-9
5.2.1 Year 2015 Intersection Performance	5-14

5.2.2	Year 2030 Intersection Analysis	5-14
6.0	IMPLEMENTATION PLAN	6-1
6.1	Future Roadway Functional Classification Plan	6-1
6.2	Year 2030 Roadway Improvement Plan	6-1
6.3	Transportation Revenue Outlook	6-1
6.4	Implementation Action Items	6-5
6.4.1	Stakeholder Coordination	6-5
6.4.2	Corridor Studies	6-5
6.4.3	Roadway Safety Review	6-5
6.4.4	Traffic Data Collection	6-6
6.4.5	Household Travel Survey	6-6
6.4.6	Monitor and Update Sub-Regional Travel Demand Model and Transportation Plan	6-6

List of Figures

<u>Section</u>	<u>Page</u>
Figure 1-1 Vicinity Map _____	1-2
Figure 1-2 Study Area and Major Roadway Network _____	1-3
Figure 2-1 Year 2006 Estimated Population Density by Traffic Analysis Zone _____	2-3
Figure 2-2 Estimated 2006 Employment Density by Traffic Analysis Zone _____	2-5
Figure 2-3 Typical Roadway Cross-Sections _____	2-8
Figure 2-4 Year 2006 Roadway Network and Traffic Counts _____	2-10
Figure 3-1 Travel Demand Model Development Process _____	3-1
Figure 4-1 Year 2030 Estimated Population Density by Traffic Analysis Zone _____	4-3
Figure 4-2 Year 2030 Estimated Employment Density by Traffic Analysis Zone _____	4-4
Figure 4-3 Land Ownership and Planned Developments _____	4-5
Figure 5-1 Existing-Plus-Committed Roadway Network _____	5-3
Figure 5-2 Forecast Level-of-Service: Existing-Plus-Committed Roadway Network _____	5-4
Figure 5-3 Committed-Plus-Planned Roadway Network _____	5-6
Figure 5-4 Forecast Level of Service: Committed-Plus-Planned Roadway Network _____	5-8
Figure 5-5 Alternative 'A' Roadway Network _____	5-10
Figure 5-6 Forecast Level of Service: Alternative 'A' (2030) _____	5-11
Figure 5-7 Pinetop-Lakeside Planning Area Intersections _____	5-13
Figure 6-1 Future Roadway Functional Classification Plan _____	6-2
Figure 6-2 Year 2030 Roadway Improvement Plan _____	6-3

List of Tables

<u>Section</u>	<u>Page</u>
Table 2-1 Estimated 2006 Population in the Pinetop-Lakeside Planning Area _____	2-2
Table 2-2 2006 Employment in the Southern Navajo/Apache County Sub-Region _____	2-2
Table 2-3 Estimated 2006 Employment in the Pinetop-Lakeside Planning Area _____	2-4
Table 2-4 Characteristics of Roadway Functional Classifications _____	2-7
Table 2-5 Roadway Width and Right-of-Way Requirements for Major Roadways _____	2-9
Table 4-1 Sub-Region Population and Employment Estimates _____	4-1
Table 5-1 Current and Future External Daily Traffic Volume Estimates _____	5-2
Table 5-2 Cut-Line Summary: Year 2030 Committed-Plus-Planned Roadway Network _____	5-7
Table 5-3 Cut-Line Analysis Comparison: Year 2030 Committed-Plus-Planned Network v. Alternative 'A' Network _____	5-12
Table 5-4 Traffic Control at Pinetop-Lakeside Intersections: Existing, 2015, & 2030 _____	5-14
Table 6-1 Town of Pinetop-Lakeside Planning Area Roadway Improvement Needs _____	6-4

1.0 INTRODUCTION

Navajo and Apache Counties are located in the central portion of eastern Arizona, as shown in Figure 1-1. This region, known as the White Mountain Region, currently is experiencing tremendous pressure for development. Regional growth has led to the need for an updated plan to address transportation issues and infrastructure needs of the communities located within the White Mountain Region.

1.1 STUDY BACKGROUND

During 1999, the White Mountain Region completed the *White Mountain Regional Transportation Plan*, which covered the southern area of Navajo and Apache counties. At that time, it was identified that the area was becoming increasingly popular for both winter and summer activities, and as a location for retirement and second homes for residents of the Phoenix and Tucson areas. At the time of the 1999 Plan, average annual population growth was approximately:

- 1.3 percent for Apache County;
- 1.4 percent for Navajo County;
- 2.4 percent for Snowflake;
- 6.2 percent for Show Low;
- 2.2 percent for Taylor; and
- 5.7 percent for Pinetop-Lakeside.

Unexpected, significant growth has occurred primarily in a sub-region of the Plan's defined study area since completion of the 1999 Plan.

A need was identified to develop a Sub-Regional Transportation Plan to address needed transportation improvements to accommodate the unanticipated growth. Subsequently, the City of Show Low approved their General Plan in October 1999 and a Major Streets and Routes Plan was completed in January 2002. Also, the Town of Snowflake completed its General Plan in November 2000; Pinetop-Lakeside completed their Regional Plan during March 2001; and, Navajo County completed their Comprehensive Plan during May 2004. All of these planning documents used the findings from the 1999 White Mountain Regional Transportation Plan as the basis for their transportation planning efforts. Most recently, the Town of Pinetop-Lakeside completed a Pinetop-Lakeside Population Projection report, dated July 27, 2005, in an attempt to better understand how growth is occurring. Growth projections presented in the report range from 3.01 to 7.0 percent annual growth; 3.0 to 4.0 percent is recommended for planning purposes.

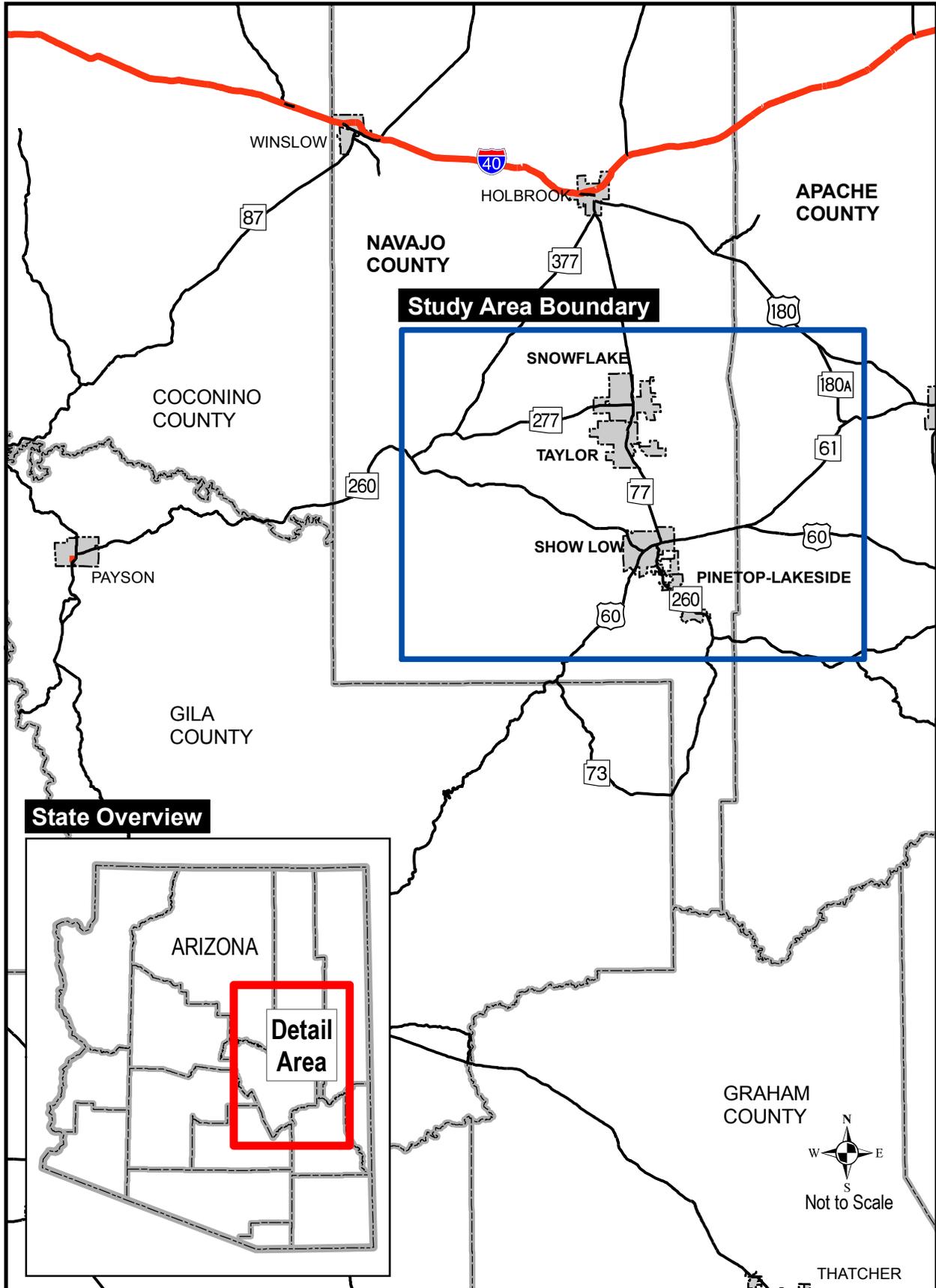
This *Southern Navajo County/Apache County Sub-Regional Transportation Plan* specifically addresses the needs of the Town of Snowflake, Town of Taylor, City of Show Low, Town of Pinetop-Lakeside, and the unincorporated areas of southern Navajo and Apache Counties, including the communities of Concho and Vernon. The focus of this Sub-Regional Transportation Plan is the roadway system in southern Navajo and Apache Counties encompassing an area bounded by the Town of Pinetop-Lakeside in the south, the Town of Snowflake in the north, Pulp Mill Road to the west, and the Concho area in Apache County to the east. Figure 1-2 depicts the Sub-Regional Study Area adopted for planning purposes.

1.2 STUDY PURPOSE

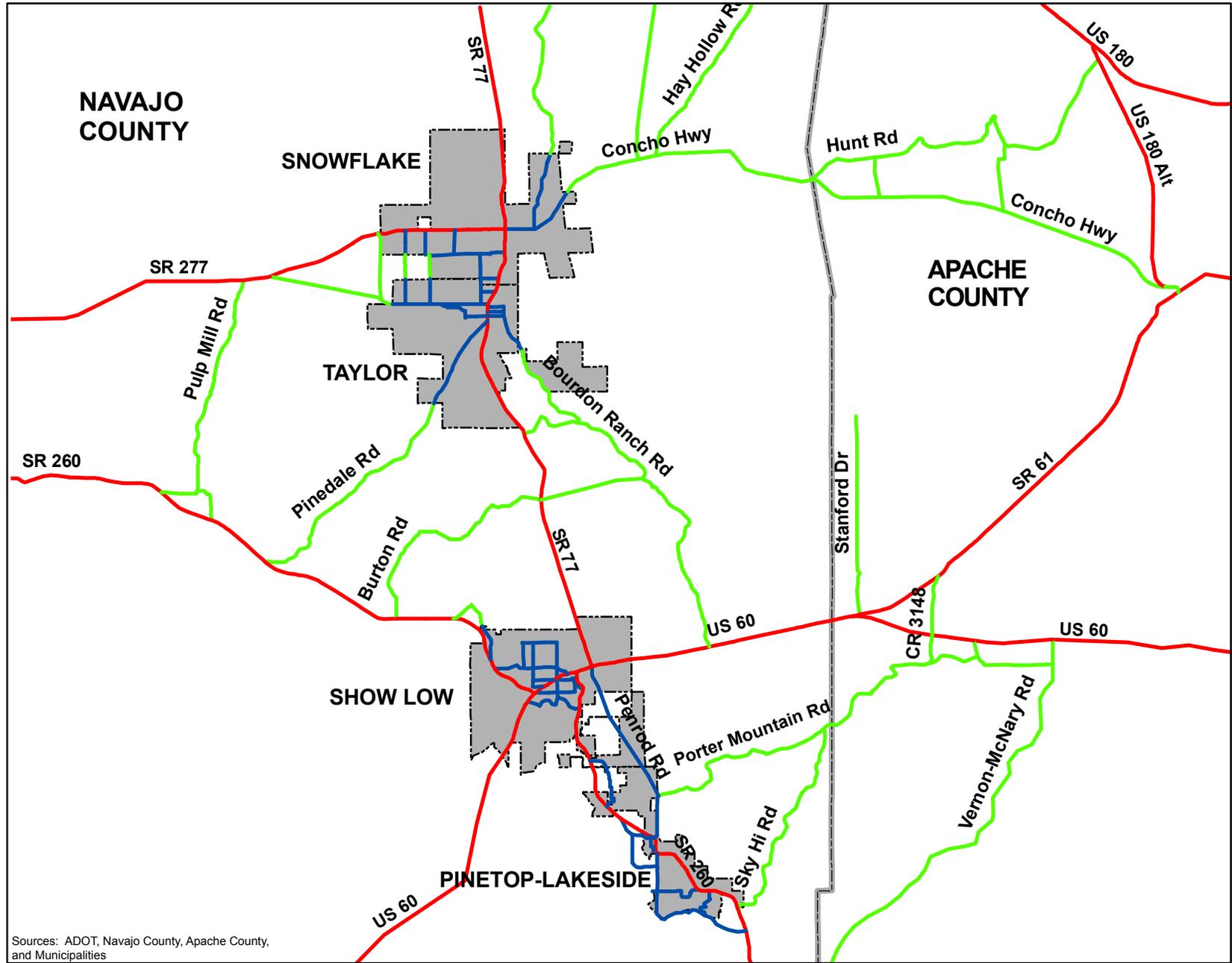
The scope of the Sub-Regional Transportation Plan was developed in a collaborative process involving a project-specific Technical Advisory Committee (TAC) and the standing White Mountain Regional Transportation Committee (WMRTC). The TAC was composed of staff from the following entities:

- Navajo County;
- Apache County;
- Arizona Department of Transportation (Globe District);
- Town of Snowflake;
- Town of Taylor;

Southern Navajo/Apache County Transportation Plan



Navajo/Apache County Study Area Overview



STUDY AREA AND MAJOR ROADWAY NETWORK

Jurisdiction	
—	County
—	Arizona Dept of Transportation
—	Municipality

Base Map Features	
	Cities/Towns



Not to Scale

Sources: ADOT, Navajo County, Apache County, and Municipalities



FIGURE 1-2

- City of Show Low; and
- Town of Pinetop-Lakeside.

The Sub-Regional Transportation Plan addresses transportation issues associated with each community participating in the study. TAC members helped to shape the scope of the planning effort by shaping goals and deliverables. The TAC also provided valuable data regarding existing conditions for their specific municipality or unincorporated area, including: previous studies, comprehensive planning documents, and submitted development proposals. Five goals were set to be addressed within the framework of the Sub-Regional Transportation Plan:

- (1) Understand key stakeholder issues and needs;
- (2) Identify imminent and future developments within the defined Sub-Region;
- (3) Develop a customized travel demand model to enable estimation of transportation volumes relative to both the existing and forecasted land use;
- (4) Produce growth forecasts for each municipality and unincorporated area; and
- (5) Analyze feasible alternatives for improving the roadway network in the Sub-Region.

1.3 PINETOP-LAKESIDE COMMUNITY TRANSPORTATION PLAN

The *Town of Pinetop-Lakeside Community Transportation Plan* focuses specifically on the transportation issues and needs of the Town. The Plan summarizes existing roadway and traffic conditions, establishes likely future conditions, presents an Implementation Plan for transportation improvements, and provides transportation facility development policies and guidelines. The Plan focuses on future travel conditions in 2015 and 2030 and the recommended Implementation Plan is designed to mitigate potential roadway system deficiencies expected to arise as a result of projected population and employment growth. Detailed information relating to methodologies employed during preparation of the Plan and specific assumptions adopted for forecasting future transportation needs for the Town of Pinetop-Lakeside may be referenced in the Sub-Regional Transportation Plan.

2.0 EXISTING CONDITIONS

This section provides an overview of socioeconomic and roadway conditions within the Sub-Regional Transportation Plan Study Area and the Town of Pinetop-Lakeside Planning Area for the year 2006. It includes an updated population and employment estimate and an inventory of roadway facilities.

2.1 CURRENT SOCIOECONOMIC CONDITIONS

An estimate of year 2006 population and employment was developed from several sources including Census 2000 population data, historic building permit activity, and a commercial employment database. This section presents estimates of the 2006 population and employment for the Sub-Region and the Town of Pinetop-Lakeside.

2.1.1 YEAR 2006 POPULATION ESTIMATE

Significant growth has occurred within the Sub-Region since the year 2000. In 2000, the Census Bureau identified over 22,900 dwelling units (DUs) within the Sub-Region. Census Bureau reports indicated over 35,600 people forming 13,000 households. Approximately 57 percent of the total DUs were occupied on census day, which was April 1, 2000. This low occupancy rate (the rate for the State of Arizona is close to 75%) reflects the large number of seasonal summer homes in the Sub-Region. In addition to variations in seasonal occupancy, the number of persons living in each household also varied by location. There was an average of 2.74 persons per household in the Sub-Regional Study Area.

Building permit information obtained from local jurisdictions participating in this Sub-Regional Transportation Plan was used to develop an estimate of the population in 2006. The number and type of building permits indicated nearly 5,400 new individual DUs were added between January 1, 2000, and May 31, 2006. Therefore, the estimated number of DUs in the Sub-Region in 2006 was determined to be 28,300. This estimated growth translates into nearly a five percent annual increase in DUs between 2000 and 2006.

The estimated 2006 Sub-Region population was determined by applying the seasonal occupancy patterns and household size reported in Census data to the new estimated number of DUs in 2006. This method resulted in an estimated population of 43,870 in the Sub-Region in 2006. The 2006 population estimate was distributed, based data for 2000 Census districts, to a total of 120 traffic analysis zones (TAZs). A TAZ is defined as a geographic area that contains socioeconomic data attributes regarding population and employment (estimated 2006 employment also was distributed; this is discussed in the next section). Typically, TAZ boundaries are comprised of relatively fixed or permanent physical or geographic features, such as roadways, rivers, mountain ranges, or other physical features. Distributed socioeconomic data was used to model or estimate the number of trips taken throughout the Sub-Region.

Table 2-1 presents the estimated 2006 household and population data for the Town of Pinetop-Lakeside Planning Area by TAZ. Table 2-1 indicates the Pinetop-Lakeside Planning Area was home to 3,454 separate households accounting for 8,274 persons in 2006. This translates in to 2.40 persons per household, which is less than the average for the Sub-Region. Reflecting the overall low occupancy of DUs in the Sub-Region, only 51 percent of the DUs in the Pinetop-Lakeside Planning Area were occupied in 2006. Figure 2-1 shows the estimated population density distributed to TAZs applicable to the Pinetop-Lakeside Planning Area.

2.1.2 YEAR 2006 EMPLOYMENT ESTIMATE

Employment estimates were developed for the Sub-Region using data from the 1999 *White Mountain Regional Transportation Plan* coupled with a commercial database purchased for this study. The employment database provided information on business locations, number of employees, and industry type. Focusing on the major employers, the database information was then cross-checked against employer information included in the 1999 Plan. The study team verified this employment database with study participants and the TAC. Through this process, an estimate of 15,200 jobs was established for the Sub-Region. Table 2-2 shows the job totals by employment classification.

Table 2-1
Estimated 2006 Population in the Pinetop-Lakeside Planning Area

Traffic Analysis Zone	Dwelling Units	Households	Population
101	297	249	703
102	484	294	792
103	51	28	61
105	482	289	804
106	292	124	327
108	989	539	1468
109	101	79	171
110	1032	494	1239
111	497	298	117
112	697	353	893
113	223	134	333
114	494	257	628
115	954	200	442
118	193	116	296
TOTAL	6,786	3,454	8,274

Sources: US Census of Population, 2000; Wilson & Company, May 2007

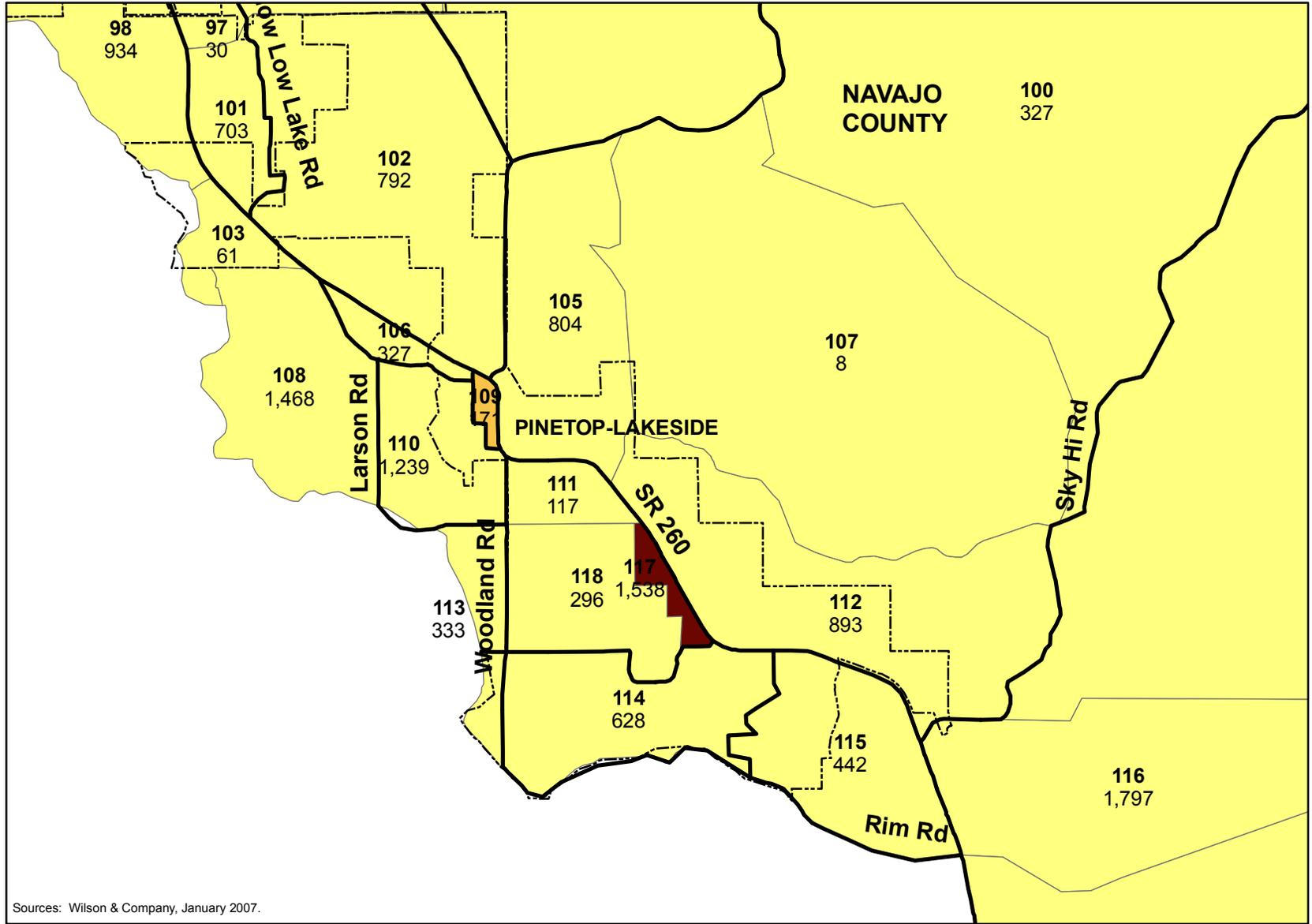
Table 2-2
2006 Employment in the Southern Navajo/Apache County Sub-Region

Classification	Employment
Retail	5,028
Office	7,164
Government	1,273
General	1,761
Total	15,226

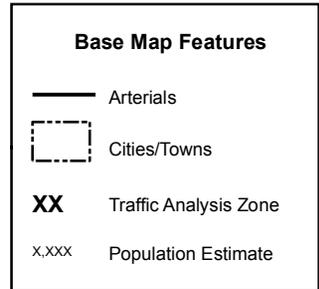
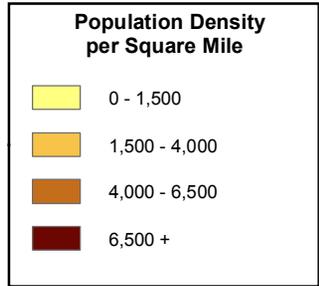
Sources: White Mountain Regional Transportation Plan, 1999; InfoUSA, 2006; Wilson & Company, May 2007.

The Sub-Region 2006 employment estimate was distributed to TAZs applicable to the Town of Pinetop-Lakeside in the same manner as described for the estimated 2006 population. Table 2-3 presents the estimated employment in each applicable TAZ by classification. The table indicates there were approximately 4,200 active jobs in the Pinetop-Lakeside Planning Area in 2006. The majority of these jobs (approximately 2,300, 54%) were in the Office sector. Persons employed in Retail-related activities accounted for over 1,200 more jobs. This pattern is similar to the Sub-Region as a whole (refer to Table 2-2). However, employment in the Office sector is almost twice the size of the Retail sector indicating less commercial development. In the Sub-Region, employment in the Office sector is only about 43 percent greater than employment in the Retail sector. In contrast to the Sub-Region, in which employment in the General sector of the economic is 38 percent greater than employment in the Government sector, employment in Pinetop-Lakeside in the Government sector is 68 percent greater than employment in the General sector. Figure 2-2 shows the estimated 2006 employment distributed to TAZs applicable to the Pinetop-Lakeside Planning Area.

Pinetop-Lakeside Overview



YEAR 2006 ESTIMATED POPULATION DENSITY BY TRAFFIC ANALYSIS ZONE



Not to Scale

Sources: Wilson & Company, January 2007.

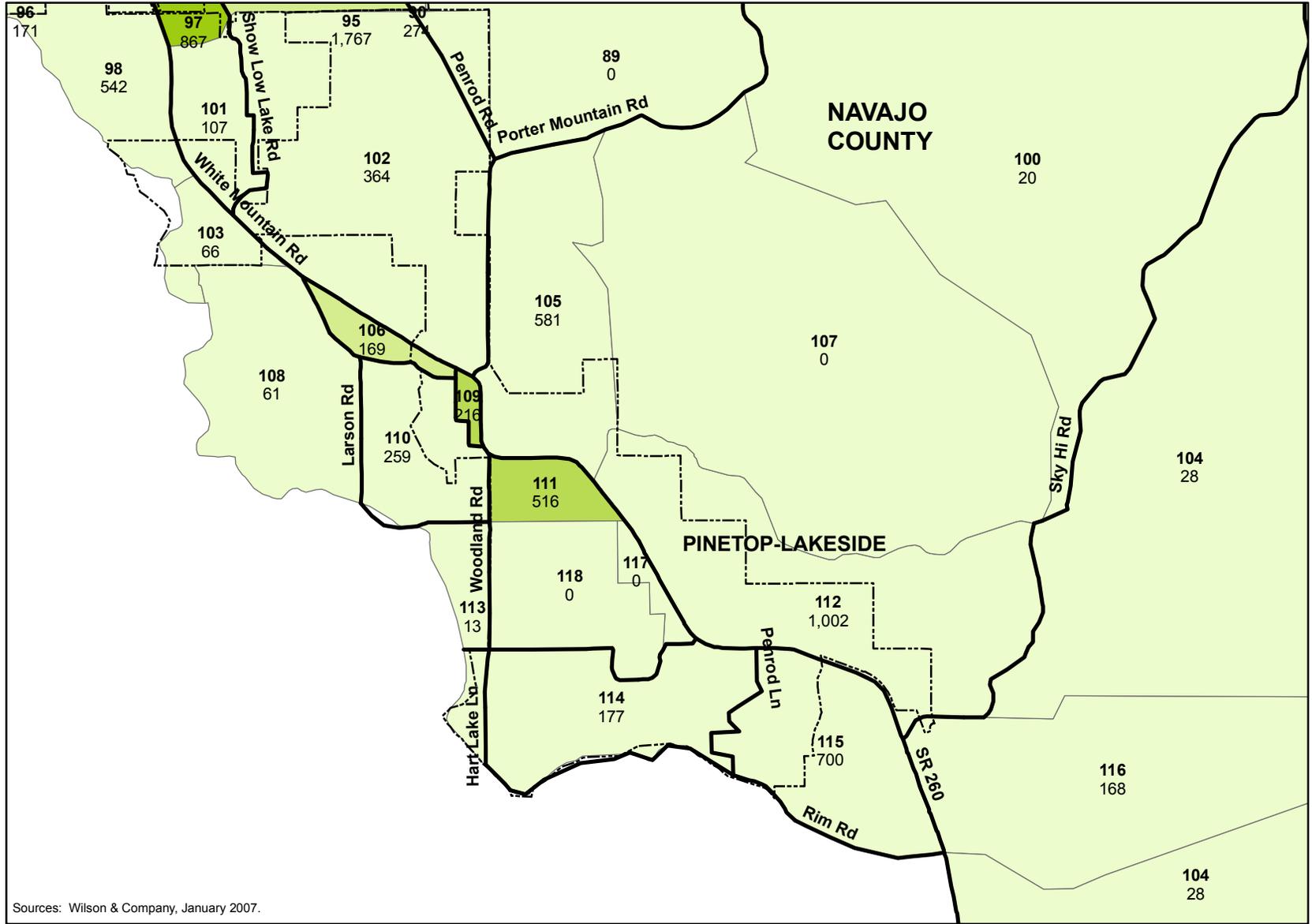
FIGURE 2-1

**Table 2-3
Estimated 2006 Employment in the Pinetop-Lakeside Planning Area**

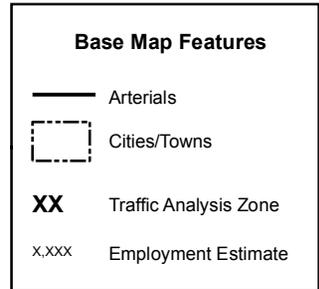
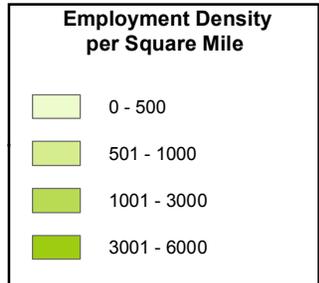
TAZ	Employment Classification				Total
	Retail	Office	Government	General	
101	65	33	0	9	107
102	44	216	89	15	364
103	25	33	0	8	66
105	96	462	0	23	581
106	54	88	0	27	169
108	27	14	0	20	61
109	76	117	0	23	216
110	1	48	190	20	259
111	240	189	0	87	516
112	380	478	99	45	1002
113	5	4	0	4	13
114	90	76	0	11	177
115	111	523	63	3	700
118	0	0	0	0	0
TOTAL	1,214	2,281	441	295	4,231

Sources: White Mountain Regional Transportation Plan, 1999; InfoUSA, 2006; Wilson & Company, May 2007.

Pinetop-Lakeside Overview



YEAR 2006 ESTIMATED EMPLOYMENT DENSITY BY TRAFFIC ANALYSIS ZONE



Not to Scale

Sources: Wilson & Company, January 2007.



FIGURE 2-2

2.1.3 CURRENT ROADWAY SYSTEM

2.1.4 JURISDICTIONAL RESPONSIBILITY

The State of Arizona is responsible for all State routes in the Sub-Region. Navajo County and Apache County administer all roadways in the unincorporated portions of their respective jurisdictions. The Town of Pinetop-Lakeside administers all non-State roadways within its corporate limits (Refer to Figure 1-2, presented in Section 1, for the jurisdictional responsibility for roadways in Pinetop-Lakeside).

2.1.5 ROADWAY FUNCTIONAL CLASSIFICATION

Roads are classified according to specific design and traffic characteristics. The functional classification process categorizes roads by how they perform in regard to providing access and mobility within the community. A principal arterial, for example, typically provides mobility for longer distance trips with higher speeds and less access to adjoining properties. Conversely, the function of a local street is to provide direct access to neighborhoods with lower speeds. The Sub-Region's roadway network includes four roadway functional classifications.

- **Principal Arterial:** This facility serves regional circulation needs. It moves traffic at moderate speeds while providing limited access to adjacent land. Access is controlled through raised medians and through spacing and location of driveways and intersections. In the Sub-Region, a principal arterial is a two- or four-lane State highway.
- **Minor Arterial:** The general purpose of a Minor Arterial is to serve regional/sub-regional traffic circulation needs by moving traffic at moderate speeds, while providing limited access to adjacent land. Access to minor arterial streets is limited to intersections at quarter-mile spacing and to driveways of major developments, such as large commercial, industrial, or office complexes, or master-planned communities. On-street parking is not allowed.
- **Major Collector:** This class of roadway provides for shorter distance trips, generally less than three miles, and primarily serves to collect and distribute traffic between key traffic generators, local streets, and arterial streets. Design guidelines for this roadway classification provide for direct access to abutting land. Access to major collector streets is limited to intersections at eighth-mile spacing and to driveways to adjacent developments. All vehicles entering the traffic stream must be driving forward; no backing into traffic is allowed. On-street parking is not allowed.
- **Minor Collector:** Minor Collectors serve shorter distance trips than the Major Collector, generally less than one mile. This class of roadway provides direct access to adjacent land and collects and distributes traffic between key traffic generators, local streets, and arterial streets. Access to Minor Collector streets should be restricted except for large contiguous lots

As the functional classification changes from arterial roadway to local roadway, the level of access generally increases, the capacity decreases, and the purpose of the roadway changes from efficiently moving vehicles to providing direct property access. Table 2-4 provides a summary of the characteristics of each of the four roadway functional classifications applicable to the Pinetop-Lakeside community.

2.1.6 PRINCIPAL SUB-REGIONAL ROADWAY NETWORK

STATE HIGHWAY SYSTEM

State and Federal highways form the arterial backbone of the existing sub-regional roadway system in southern Navajo and Apache Counties. They are maintained by the Arizona Department of Transportation (ADOT) and provide intra-regional mobility between the communities of Pinetop-Lakeside, Show Low, Taylor, and Snowflake. ADOT facilities also provide interregional linkages between the Sub-Region and other population centers, including the Phoenix metropolitan area. There is one State Principal Arterials serving the Pinetop-Lakeside Planning Area (refer to Figure 1-2):

**Table 2-4
Characteristics of Roadway Functional Classifications**

Functional Classification	Characteristics
Principal Arterial	Provides regional mobility with limited direct access. Direct commercial access can occur, but access is infrequent to preserve capacity and mobility.
Minor Arterial	Provides access between Principal/Major Arterial and Major Collector routes. The level of access generally is less than on a Major Arterial, but more than a Major Collector. Direct commercial access typically is provided on Minor Arterial routes.
Major Collector	Provides access between Major Collector and Minor Arterial routes. The level of access generally is less than on a Minor Collector, but more than a Minor Arterial.
Minor Collector	Provides access between local streets and Major Collector routes

Source: Wilson & Company, May 2007

- **SR 260:** SR 260 (aka White Mountain Road/Boulevard) is a State Major Regional Principal Arterial providing access to Show Low and Payson to the north and west and Springerville/Eager to the east. SR 260 is coincident with SR 73 through Pinetop-Lakeside. SR 73 is nominally an east-west highway primarily serving the Fort Apache Indian Reservation. In rural portions of the Sub-Region, this facility exists as a two-lane highway. In the urbanized area between Show Low and Pinetop-Lakeside, SR 260 is a four-lane facility with a continuous center turn lane.

REGIONAL/LOCAL ROAD SYSTEM

There are two major highways forming the regional/local road system that are significant to the Pinetop-Lakeside in terms of sub-regional access.

- **Penrod Road:** Penrod Road is a Municipal Minor Arterial that parallels SR 260 south of US 60. Penrod Road provides access between Pinetop-Lakeside and SR 77 at US 60 east of Show Low. It exists as a rural two-lane highway.
- **Porter Mountain Road/Apache County Route 3144:** This roadway is a Town and County Minor Arterial providing alternative access to Vernon and the communities of Springerville and Eager to the east. It exists as a rural two-lane highway.

2.1.7 EXISTING ROADWAY CHARACTERISTICS

This section summarizes key characteristics and attributes of the roadway system serving the Sub-Region and the Town of Pinetop-Lakeside.

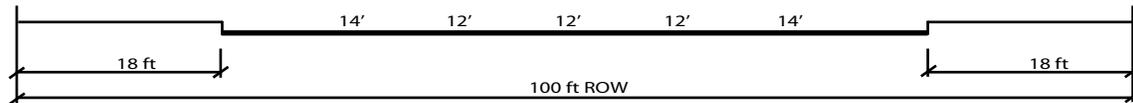
TYPICAL CROSS-SECTIONS

Roadway cross-sections from the *City of Show Low Major Streets and Routes Plan* were adopted and applied for purposes of the Sub-Regional Transportation Plan. Descriptions of roadway cross-sections by functional classification are provided below.

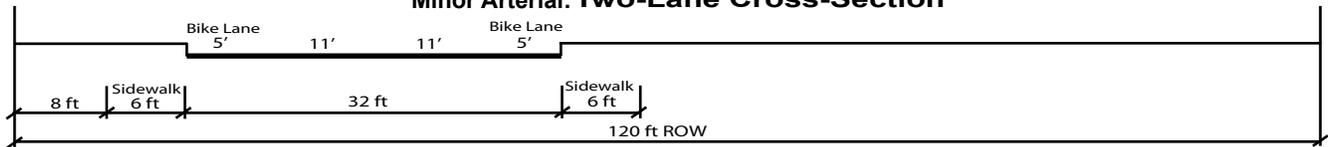
- **Principal Arterial:** The adopted cross-section for a Principal Arterial (Figure 2-3) requires 100 feet of right-of-way (R/W). In urban areas, there typically are four travel lanes and a 12-foot median that could be a raised median or a center two-way, left-turn lane. The two outside lanes are 14 feet in width, measured to the face of curb. In rural areas, there typically are two 12-foot travel lanes with a paved shoulder.
- **Minor Arterial:** A Minor Arterial (Figure 2-3) has two, four, or six travel lanes constructed within a 120-foot R/W. The travel lanes are divided by a two-way, left-turn lane or a raised median. A bike lane is included in the cross-section.

Southern Navajo/Apache County Sub-Regional Transportation Plan

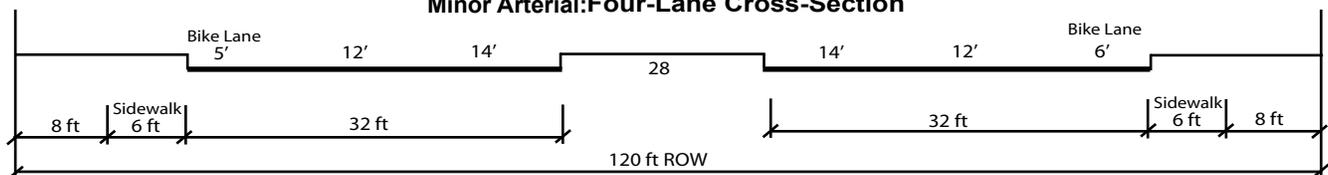
Principal Arterial



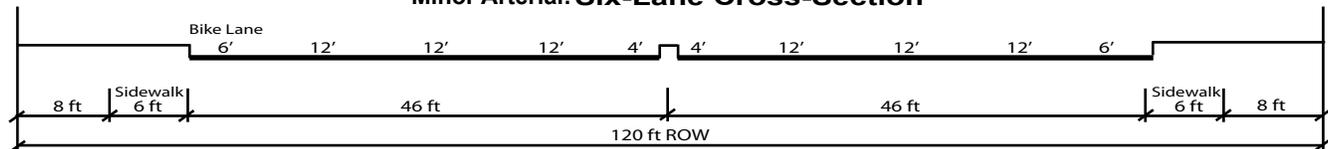
Minor Arterial: Two-Lane Cross-Section



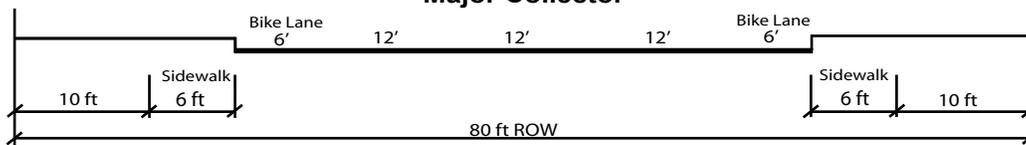
Minor Arterial: Four-Lane Cross-Section



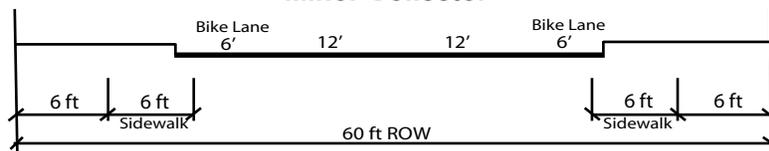
Minor Arterial: Six-Lane Cross-Section



Major Collector



Minor Collector



SOURCE: 2002 City of Show Low Streets and Routes Plan

- **Major Collector:** A Major Collector consists of two travel lanes constructed within an 80-foot R/W. As shown in Figure 2-3, opposing travel directions are separated by a two-way left turn lane or a raised median. A bike lane is included in the cross-section.
- **Minor Collector:** The cross-section for a Minor Collector, as shown in Figure 2-3, includes two travel lanes constructed within 60 feet of R/W. The 36-foot roadway consists of two 12-foot travel lanes flanked by 6-foot bike lanes in each direction.

INTERSECTION FLARE

An additional 20-foot by 150-foot parcel of R/W generally is integral to principal arterial/principal arterial, principal arterial/minor arterial, and arterial/major collector intersections to accommodate turn lanes.

RIGH-OL-WAY REQUIREMENTS

Roadway widths and R/W requirements for the four functional classifications identified above are summarized in Table 2-5.

**Table 2-5
Roadway Width and Right-of-Way Requirements for Major Roadways**

Classification	Roadway Width	Right-of-Way Width	Number of Lanes
Principal Arterial	64 feet	100 feet	5
Major Arterial	32 to 92 feet	120 feet	2 to 6
Major Collector	48 feet	80 feet	3
Minor Collector	36 feet	60 feet	2

Source: City of Show Low Major Streets and Routes Plan, Olsson Associates, 2002.

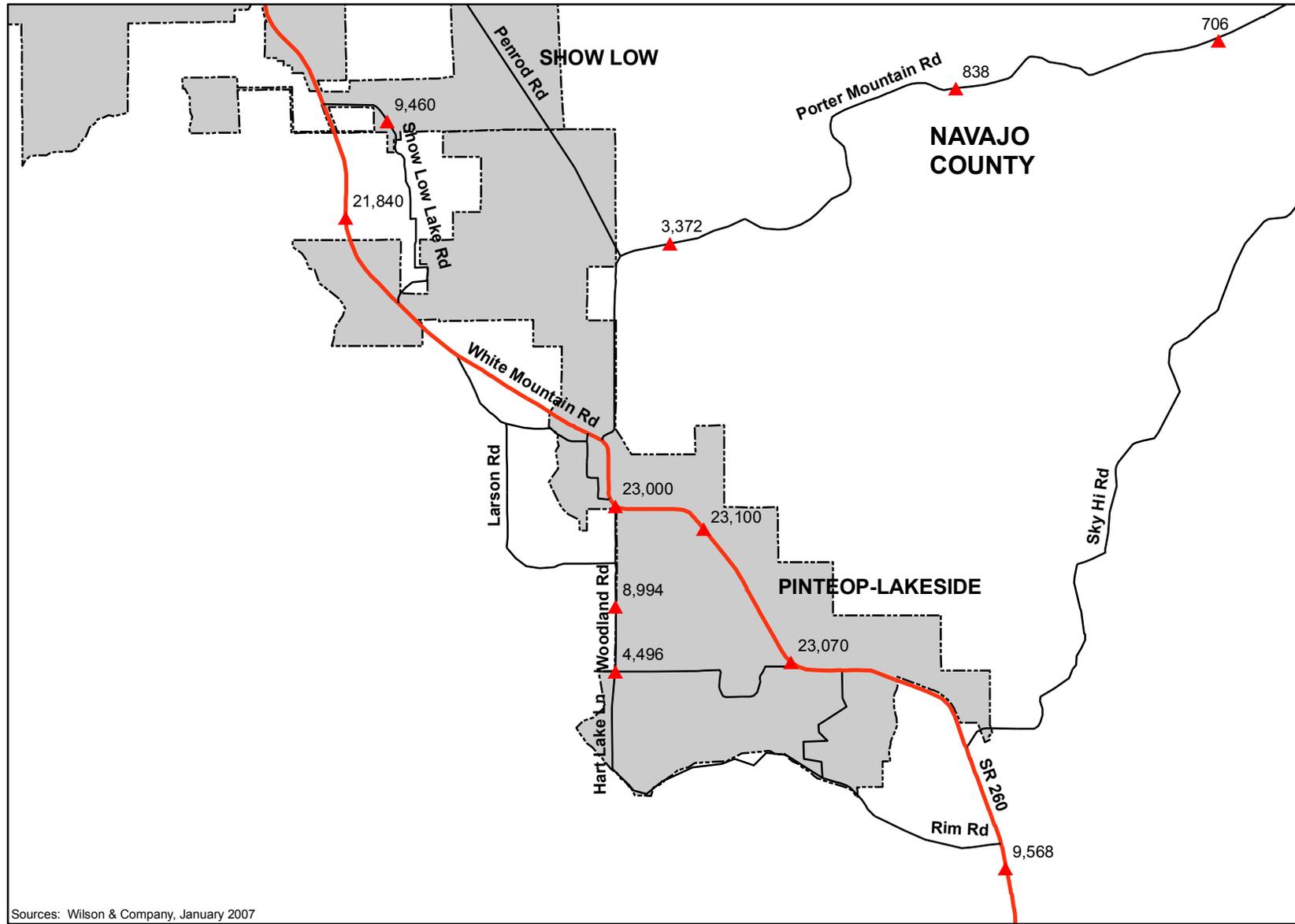
NUMBER OF LANES

Most roadways in the Pinetop-Lakeside Planning Area are two-lane facilities, providing one travel lane in each direction. Through its entire length within Pinetop-Lakeside, SR 260 (White Mountain Boulevard) is a four-lane facility with two travel lanes in each direction and a continuous center turn lane. Figure 2-4 shows the number of directional travel lanes associated with major roadways in the Pinetop-Lakeside Planning Area in 2006.

TRAFFIC COUNTS

A year 2006 traffic count database was compiled from ADOT, Navajo County, Apache County, and municipal sources. Where necessary, historic traffic count data were adjusted based on recent growth trends to approximate year 2006 traffic levels. The highest traffic counts in Pinetop-Lakeside (23,000 vehicles per day) are associated with SR 260 (White Mountain Boulevard) between Porter Mountain Road and the southeastern Town boundary in the area of Poplar Street/Pine Lake Road (refer to Figure 2-4). The traffic volume on SR 260 to the north, where the roadway enters the Town’s northern boundary, is close to 22,000 vehicles per day. Show Low Lake Boulevard, which serves northern portions of the Town, had a reported traffic volume exceeding 9,000 vehicles per day in 2006. Approximately 9,000 vehicles per day also were reported on Woodland Road between Quade and Settlers Lanes, where there is a large commercial concentration.

Pinetop-Lakeside Overview



YEAR 2006 ROADWAY NETWORK AND TRAFFIC COUNTS

Directional Lanes

- 1 Lane
- 2 Lanes
- XXX Traffic Count
- ▲ Location

Base Map Features

- ▭ Cities/Towns



Not to Scale

Sources: Wilson & Company, January 2007

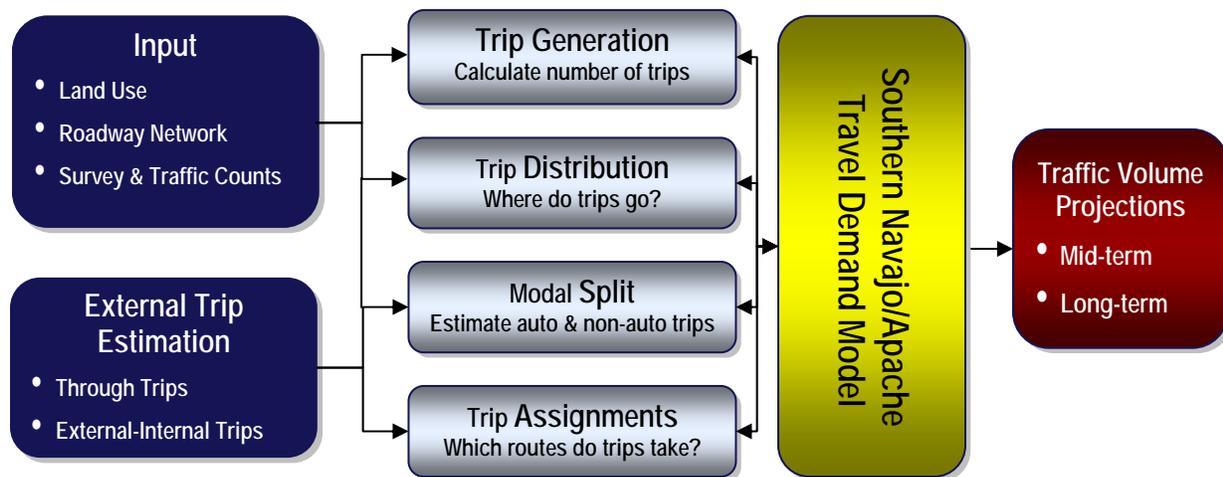


FIGURE 2-4

3.0 TRANSPORTATION MODEL DEVELOPMENT

The travel demand model of the 1999 White Mountain Regional Transportation Plan was adopted for this study. Figure 3-1 depicts the traffic model development process employed in preparation of the *White Mountain Transportation Plan*. A brief summary of the modeling process used for forecasting future travel demand and traffic levels on streets and highways in the Sub-Region is presented below. More detailed information on the process is presented in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*, which is included herein by reference.

Figure 3-1 Travel Demand Model Development Process



The model follows a four-step process to determine/project traffic volumes for a defined roadway network based on specified inputs and estimates of external trips. The Trip Generation Module converts household information into vehicle trips between TAZs. Each household generates approximately ten trips daily – five separate round-trips. Employment information is used in the Trip Distribution Module to determine where the trips generated by households want to go. The model includes a Modal Split Module to determine the number of trips or parts of trips by automobile versus transit as part of a trip (this function was not applied for this study). Finally, the Trip Assignment Module then makes a determination as to which routes would be taken by household trips. The fundamental criteria for this determination are the shortest path in the shortest amount of time. Trip assignment takes into account speed, functional class of the roadway, capacity of the roadway, and the amount of traffic using that route. If a route is too congested, the model will assign a different route that offers a shorter travel time. The final result is a forecast of anticipated traffic flows, based on the areas socioeconomic characteristics and the available roadway network. However, before a forecast can be made, a current year model is built to calibrate the model based on existing traffic counts.

4.0 SOCIOECONOMIC PROJECTIONS

Growth within the Sub-Region of southern Navajo and Apache Counties is expected to continue through year 2030, driven by a rising demand for the lifestyle and recreational opportunities offered by the White Mountain region. This section identifies relevant previous studies focused on future conditions, presents base estimates of future population and employment, and provides a summary image of the current growth patterns.

4.1 PREVIOUS PLANS AND STUDIES

General Plans, County Comprehensive Plans, and other planning studies provided a context for the year 2030 growth scenario developed for the *Southern Navajo/Apache County Sub-Regional Transportation Plan*. These studies provided information on land use, circulation, and growth areas for input into existing and future socioeconomic forecasts. Relevant plans referenced for this study included:

- *White Mountain Regional Transportation Plan*, Lima & Associates, et al., April 1999;
- *Navajo County Comprehensive Plan*, May 2004;
- *Apache County Comprehensive Plan*, August 2004; and
- *Town of Snowflake General Plan*, July 1999.

The City of Show Low is actively involved in the process of updating its General Plan, which is planned for adoption March 2008. Relevant available transportation-related information associated with this process was incorporated to the extent possible.

4.2 POPULATION AND EMPLOYMENT PROJECTIONS

Population and employment forecasts for years 2015 and 2030 were developed in consultation with the TAC. The process included a review of growth projections from previous plans and studies cited above. Land ownership patterns within the Sub-Region also were assessed; these are discussed in the following section. A workshop was conducted with the TAC to identify planned and approved developments and long-range growth areas. Through this process, population and employment growth projections were established for the Sub-Region. Table 4-1 shows population and employment projections for years 2015 and 2030. Year 2000 census data and year 2006 population and employment estimates have been included for reference.

**Table 4-1
Sub-Region Population and Employment Estimates**

Year	Dwelling Units	Occupied Dwelling Units	Population	Employment
2000	22,904 ¹	13,010 ¹	35,653 ¹	9,502 ²
2006	28,299 ³	16,135	43,870	15,300 ⁴
2015	44,300 ⁵	26,500	74,200	23,800 ⁵
2030	93,500 ⁵	61,200	177,000	51,704 ⁵

Source: Wilson & Company, May 2007.

Notes:

1. U.S. Census Bureau
2. US Census Bureau ZIP Code Business Patterns, 2000.
3. Includes 5,400 single- and multi-family building permits issued between January 1, 2000, and May 31, 2006.
4. Estimate by Wilson & Company based on July 2006 InfoUSA employment data.
5. Estimate by Wilson & Company based on growth projection.

4.2.1 POPULATION PROJECTIONS

Projected growth of DUs was based on a compound annual growth rate of five percent between year 2006 and year 2030. The growth rate would be more gradual at first but would increase as the Sub-Region population base expands. This annual rate is consistent with the growth shown by historic building permit data from year 2000 to year 2006 discussed earlier. Between 2006 and 2030, an average of 2,700 new DUs is expected to be added to the Sub-Region annually. Year 2030 population estimates were developed by applying rates for both seasonal DU occupancy and number of persons per household to the DU projections. The adopted rates for DU occupancy and persons per household vary by location throughout the Sub-Region. On average, the census data shows that 57 percent of the DUs in the Sub-Region are occupied in April. For future planning purposes in the Sub-Region, there are 2.74 persons per household. Figure 4-1 shows the estimated 2030 population distributed to TAZs applicable to the Pinetop-Lakeside Planning Area.

4.2.2 EMPLOYMENT PROJECTIONS

Employment growth is predicted to increase at the same pace as population growth. In 2006, there was less than one job per household. This low jobs/housing balance means that many persons living in the Sub-Region rely on outside sources of income or jobs outside the Sub-Region. This also reflects high number of retirement and second homes in the Sub-Region. For planning purposes, the demographic character of the Sub-Region is not expected to change significantly through the year 2030 planning horizon. It is anticipated that the overall ratio of jobs per household in year 2006 will be similar to year 2030. Figure 4-2 shows the estimated 2030 employment distributed to TAZs applicable to the Pinetop-Lakeside Planning Area.

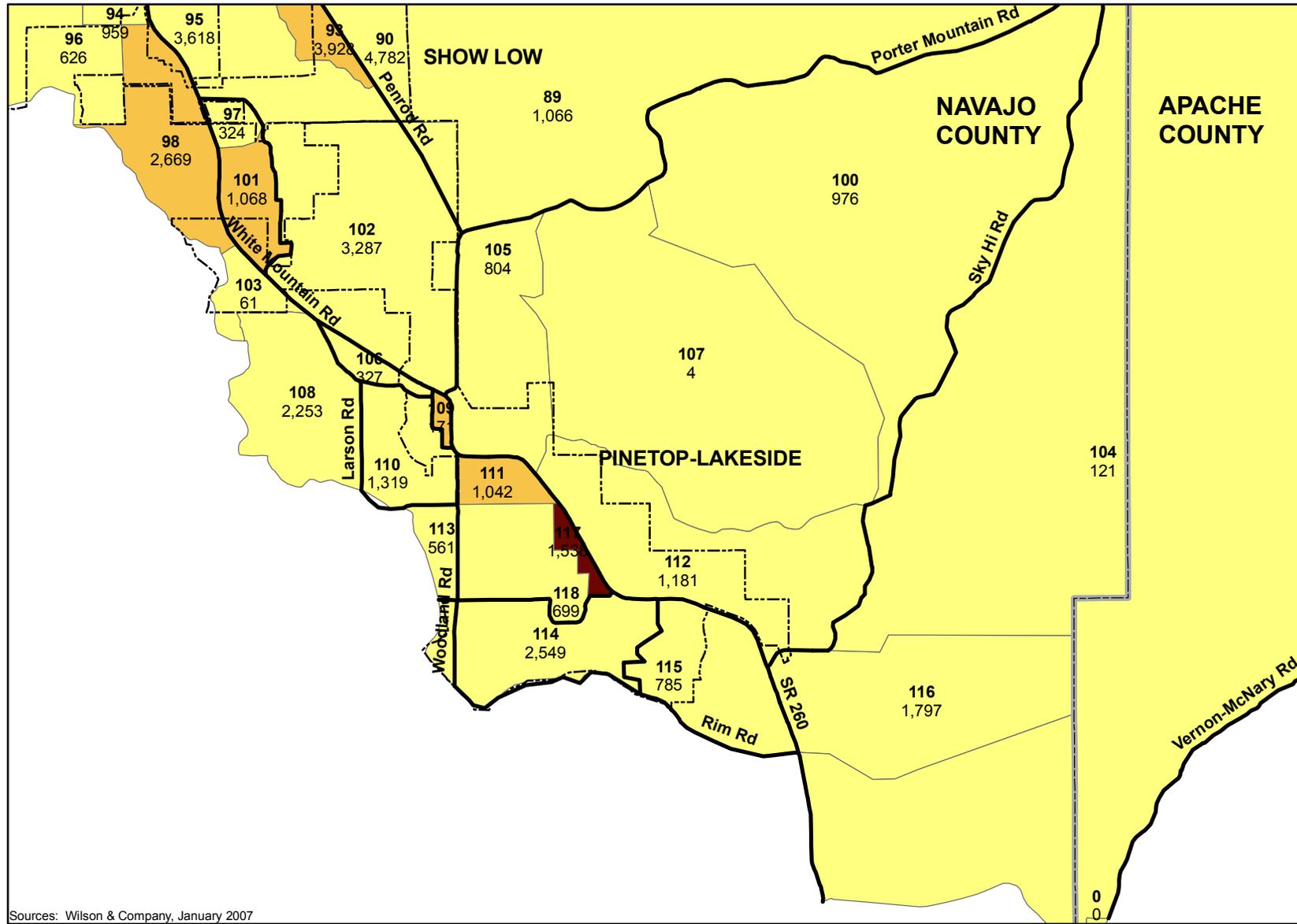
4.2.3 PLANNED DEVELOPMENTS & LAND OWNERSHIP PATTERNS

At a workshop held with the TAC, each participating jurisdiction provided the study team with known active development and residential subdivision information. The jurisdictions identified the following development activity within the Sub-Region that has either been initiated or the entitlement process has been started:

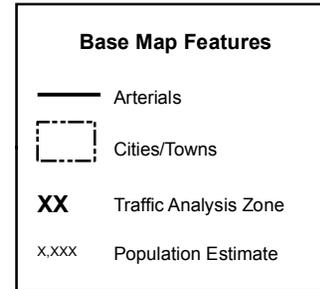
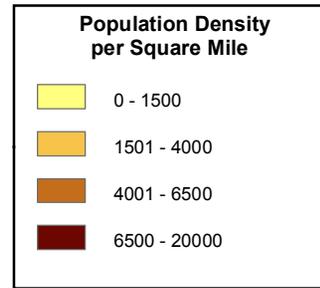
- Approximately 23,000 new residential lots;
- 232 acres of commercial development;
- 15 acres of office park; and
- 60 acres of industrial development.

In order to present the overall context of this growth activity relative to the Pinetop-Lakeside Planning Area, Figure 4-3 shows the mosaic of State, Federal, Native American lands, and private lands together with planned developments and future development areas.

Pinetop-Lakeside Overview



YEAR 2030 ESTIMATED POPULATION DENSITY BY TRAFFIC ANALYSIS ZONE

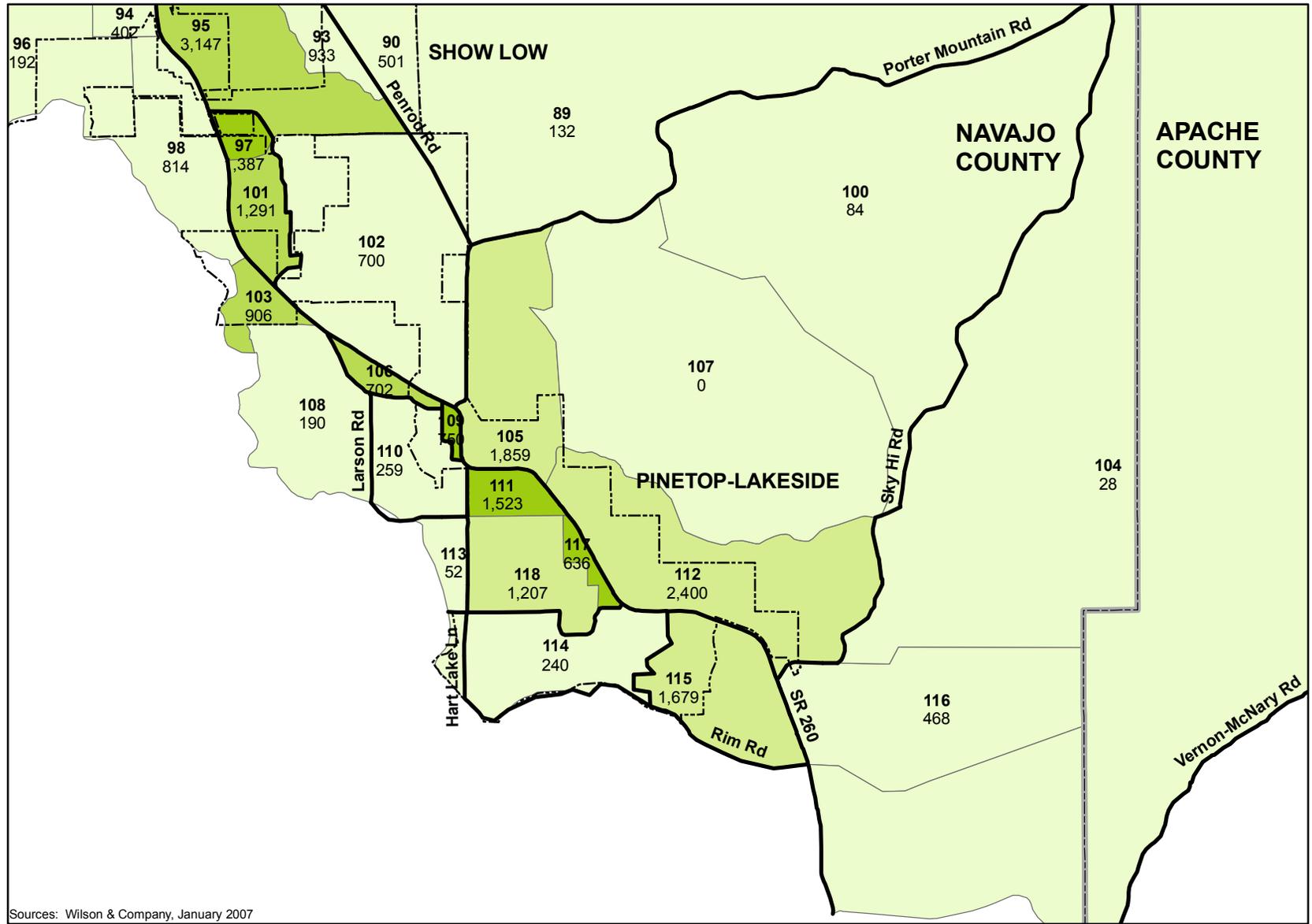


Not to Scale

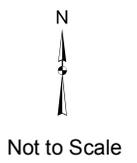
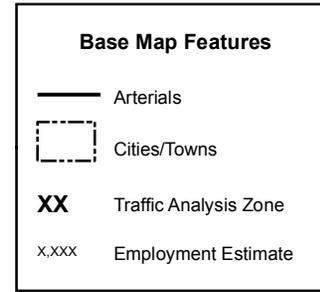
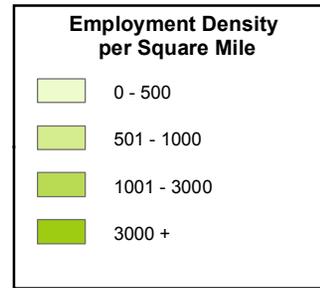
Sources: Wilson & Company, January 2007

FIGURE 4-1

Pinetop-Lakeside Overview



YEAR 2030 ESTIMATED EMPLOYMENT DENSITY BY TRAFFIC ANALYSIS ZONE

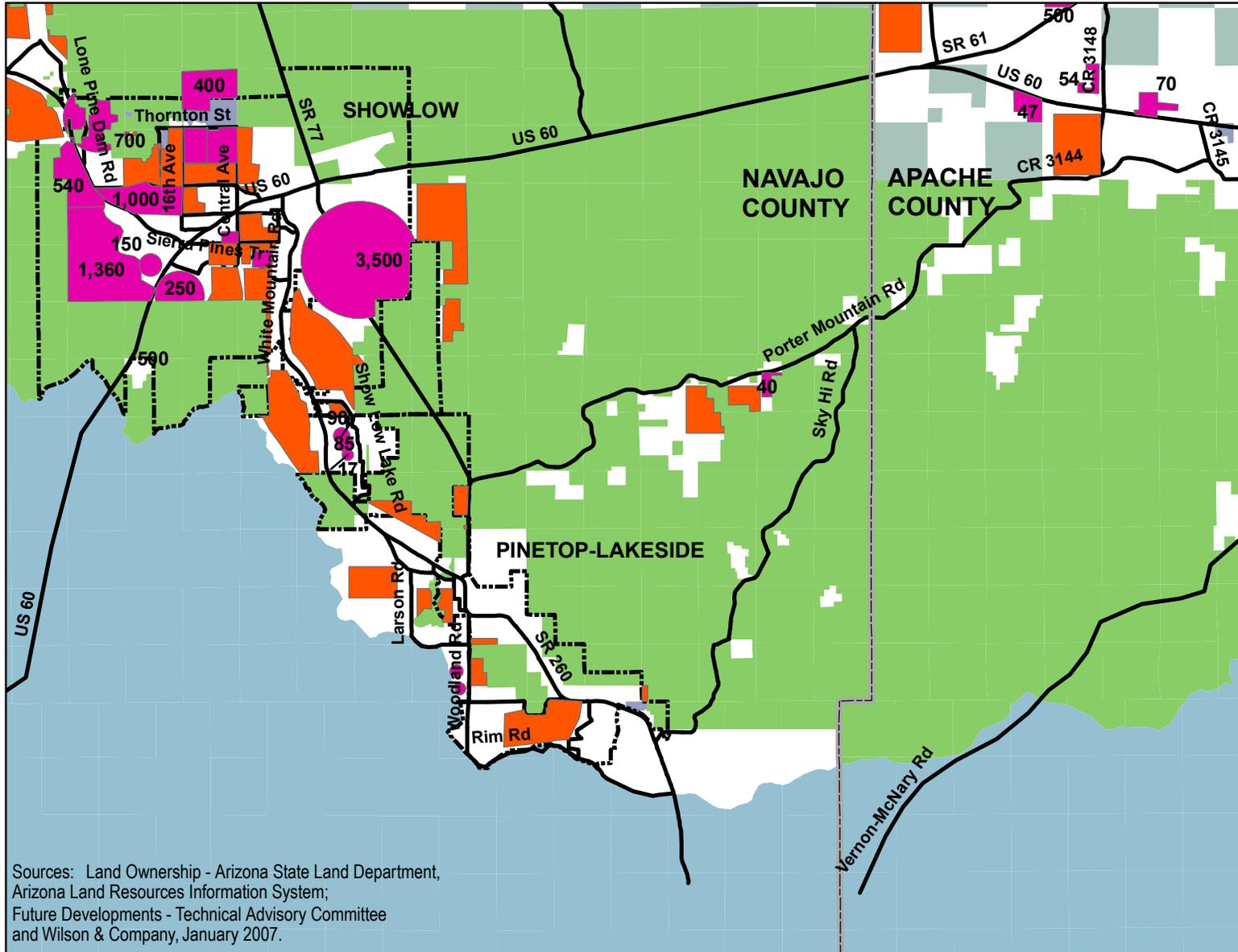


Sources: Wilson & Company, January 2007



FIGURE 4-2

Pinetop-Lakeside Overview



LAND OWNERSHIP AND PLANNED DEVELOPMENTS

Land Ownership

-  Bureau of Land Management
-  National Forest
-  Indian Reservation
-  Arizona Game and Fish Department
-  Private Land
-  State Trust Land

Future Developments

-  New/Pending Development with Potential Dwelling Units
-  Potential Development Area

Base Map Features

-  Cities/Towns
-  Arterials



Not to Scale

FIGURE 4-3

Sources: Land Ownership - Arizona State Land Department, Arizona Land Resources Information System; Future Developments - Technical Advisory Committee and Wilson & Company, January 2007.

5.0 FUTURE TRAVEL CONDITIONS

The purpose of this section is to identify for evaluation and modeling purposes the characteristics of the Town of Pinetop-Lakeside's future roadway network. Having an understanding of future roadway network characteristics is fundamental to estimating traffic volumes and developing appropriate improvement alternatives. The evaluation and modeling includes analyses of both roadway segments and key intersections. This section discusses the following aspects of future travel conditions:

- General Roadway Network Design Parameters;
- External Traffic Forecasts;
- Improvement Scenarios, including possible improvements and potential deficiencies; and
- Intersection Control and Development Requirements.

5.1 FUTURE ROADWAY SYSTEM

5.1.1 GENERAL DESIGN PARAMETERS

The maximum roadway cross-section for the planning period 2006 through 2030 has been limited by consent of the study participants to two travel lanes in each direction. Specifically, urban arterials are limited to a five-lane cross-section with two travel lanes in each direction and a continuous center turn lane. Rural arterials are limited to a four-lane cross-section with two travel lanes in each direction. This policy reflects the desire of Sub-Region communities to meet mobility needs with transportation facilities that maintain the area's rural character. This means that when all existing routes have been widened to the maximum cross-section, new alternative alignments must be considered to accommodate travel demand generated by the year 2030 population and employment growth increment.

Typically, the goal of the long-range transportation planning process is to provide for Level of Service (LOS) 'C' on new roadways and LOS 'D' on existing roadways. The planning goal for rural state highways is LOS 'B'. Nevertheless, constraints to capacity improvements, such as physical barriers, policy decisions, or funding limitations, can limit the ability of a plan to accommodate future travel demand estimates at a desirable LOS.

It also should be noted that the year 2030 travel demand forecasts prepared for this study are an order of magnitude higher than the year 2020 estimates shown in the 1999 *White Mountain Regional Transportation Plan*. The 1999 Plan accommodated year 2020 travel demand estimates at a desirable LOS. However, as projected growth of the Sub-Region occurs, it will be increasingly difficult to maintain a roadway system that satisfies the higher LOS goal generally characteristic of traditional rural areas.

5.1.2 EXTERNAL TRAFFIC FORECASTS

External traffic growth is an important component of understanding how the future roadway network will operate and developing reliable future year travel demand forecasts. External traffic growth was estimated based on historic traffic and population growth trends. Table 5-1 shows the existing year 2006 daily traffic counts and 2015 and 2030 daily traffic volume forecasts at five external stations located at the perimeter of the Sub-Region. These data were employed in the travel demand modeling process. In 2006, there were close to 30,000 daily vehicle trips in and out of the Sub-Region on an average weekday. Weekday external daily vehicle trips in the Sub-Region are forecast to grow at five percent per year over the 24-year planning horizon. In 2030, it is estimated there will be over 106,000 average weekday vehicle trips traveling to, from, and through the Sub-Regional Study Area.

**Table 5-1
Current and Future External Daily Traffic Volume Estimates**

Location	Year		
	2006	2015	2030
US 180, West of SR 180A	710	930	1,750
US 180, East of SR 180A	460	610	1,130
SR 61, East of Concho	2,480	7,600	13,950
US 60, East of Vernon	2,140	4,200	7,600
SR 260, South of Rim Rd. (Pinetop-Lakeside)	9,570	15,900	36,800
US 60, West of Rim Rd (Show Low)	3,040	5,900	10,800
SR 260, West of Paper Mill Rd.	4,390	6,900	12,800
SR 277, West of Paper Mill Rd.	2,590	5,080	9,300
SR 77, North of Snowflake	4,500	6,900	12,600
TOTAL	29,880	54,020	106,730

Source: Table 6-1, Southern Navajo Sub-Regional Transportation Plan, Wilson & Company, May 2007.

5.1.3 IMPROVEMENT SCENARIOS

EXISTING-PLUS-COMMITTED ROADWAY NETWORK

As southern Navajo and Apache Counties grow, new roadway facilities are being added both to provide access to new developments and to meet additional travel demand. When a roadway capacity improvement is incorporated in a jurisdiction’s Five-Year Capital Improvement Program (CIP), it is considered a committed improvement.

Roadway Improvements

Two committed roadway improvements were identified that are relevant to definition of the sub-regional roadway network. They primarily are developer-funded and related to growth in the SR 260 corridor between Pinetop-Lakeside and Show Low:

- Woolford Extension – a new two-lane road connecting SR 260 to Penrod Road; and
- Scott Ranch Road – a new two-lane road connecting SR 260 to Penrod Road.

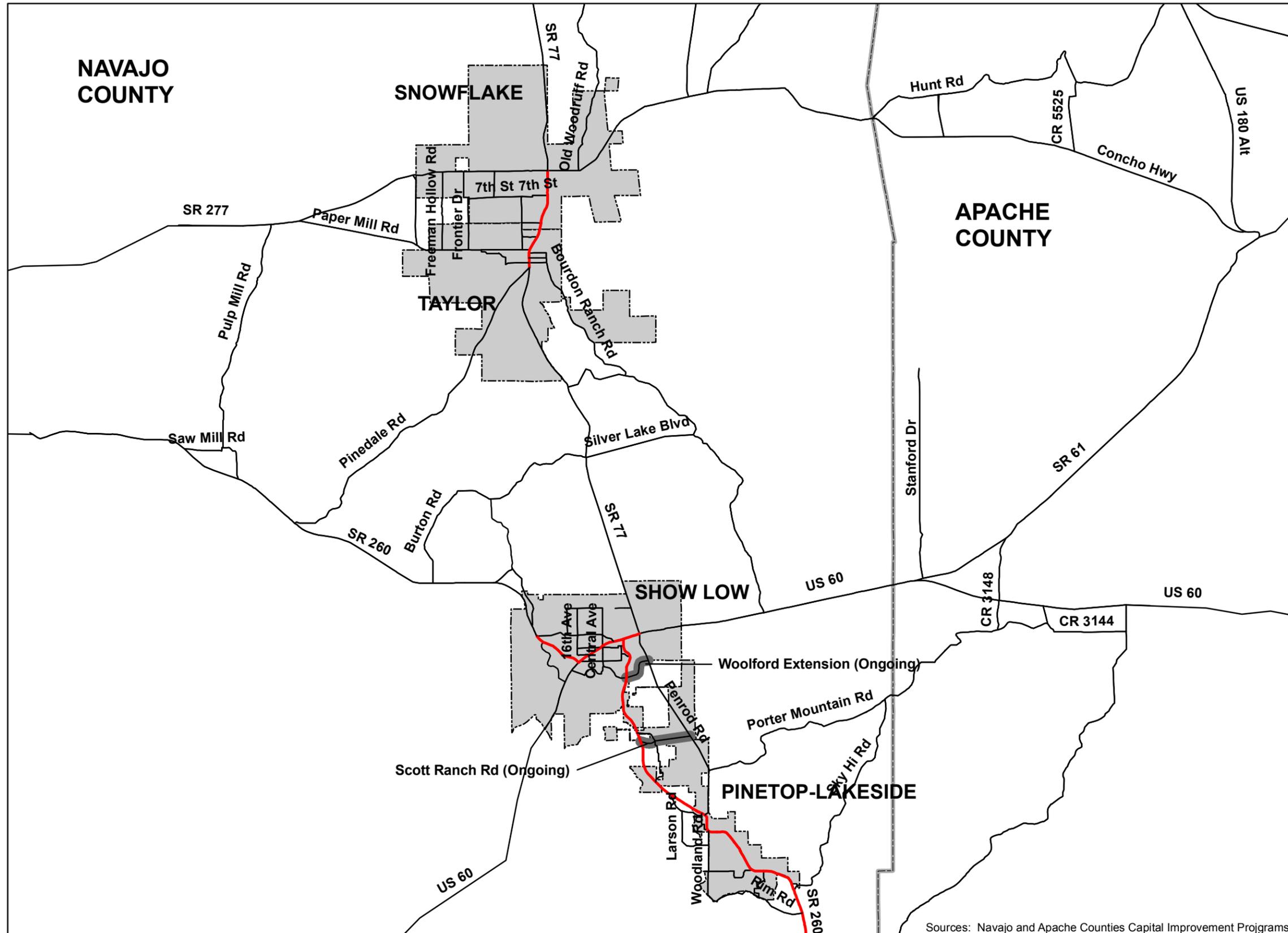
These five-year programmed roadway improvements were incorporated into the Existing-Plus-Committed 2030 roadway network, which is shown in Figure 5-1.

Evaluation of Roadway Network Deficiencies

The Southern Navajo/Apache County Travel Demand Model was used to distribute and assign 2030 average daily traffic to the sub-regional Existing-Plus-Committed roadway network. Traffic levels were based on a forecast of trips generated from the year 2030 population and employment growth estimates. The traffic forecast was based on seasonal occupancy rates found in the Census 2000 population and DU data. Figure 5-2 shows that under this “No-Build” scenario a large number of the 2030 sub-regional arterial network would be carrying daily traffic volumes in excess of available capacity. A significant number of roadway segments would be operating at LOS 'E' or worse in the Town of Pinetop-Lakeside, as cited below:

- LOS 'E'
 - S. Hart Lake Lane – from W. Woodland Lake Road for approximately one-half mile to the south;
 - SR 260 – between Buck Springs Road and Rim Road;
- LOS 'F'
 - SR 260 – the complete length of this arterial through the Town from the northwest city limits north of Wagon Wheel Road to the southeast city limits at south of Poplar Street;

Navajo/Apache County Study Area Overview



EXISTING-PLUS-COMMITTED ROADWAY NETWORK

Directional Lanes

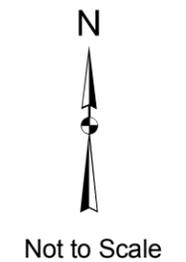
- 1 Lane
- 2 Lanes

Improvement Scenario

- Existing-Plus-Committed

Base Map Features

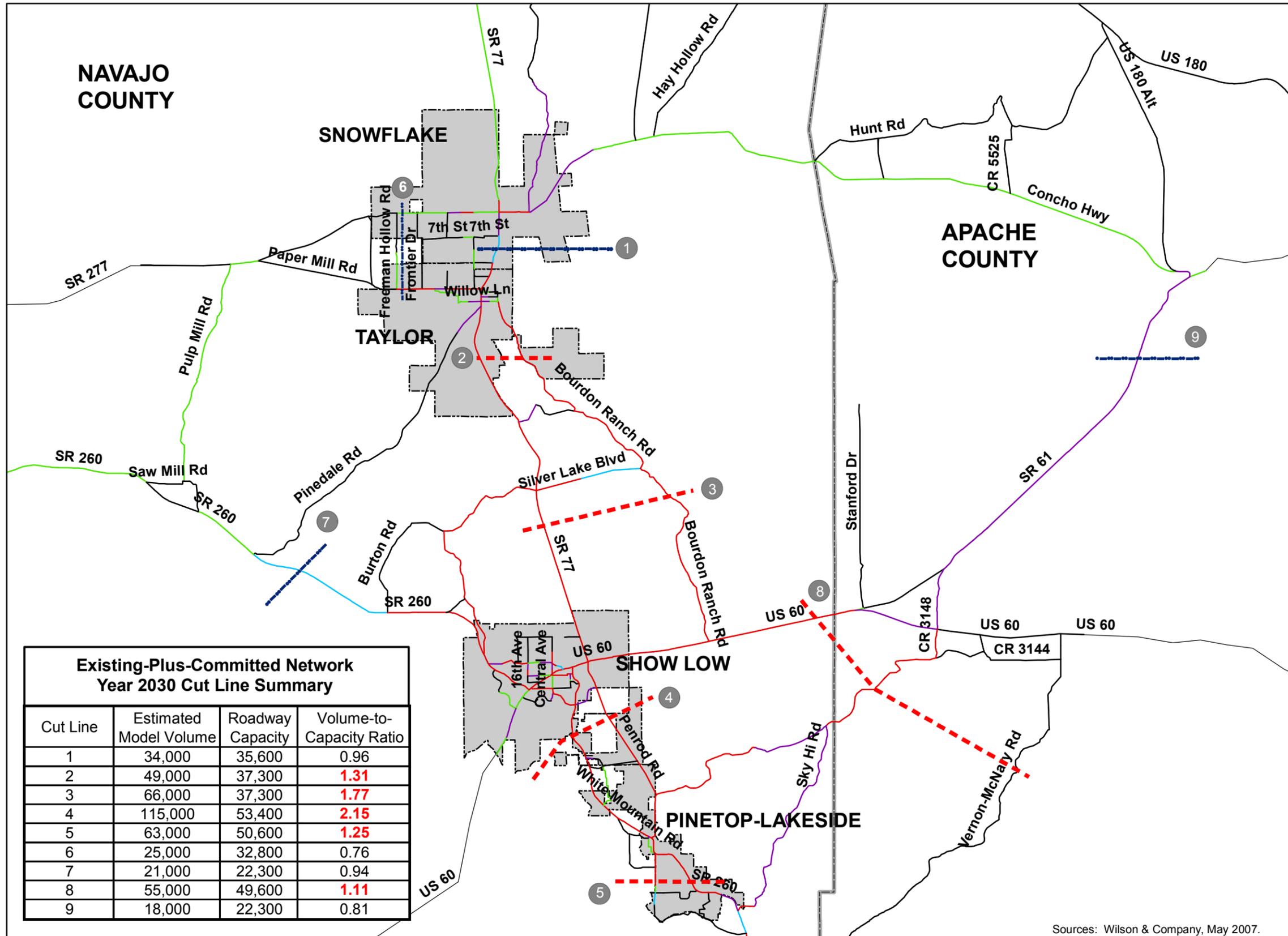
- Cities/Towns



Sources: Navajo and Apache Counties Capital Improvement Programs

FIGURE 5-1

Navajo/Apache County Study Area Overview



**FORECAST 2030
LEVEL OF SERVICE:
EXISTING-PLUS-COMMITTED
ROADWAY NETWORK**

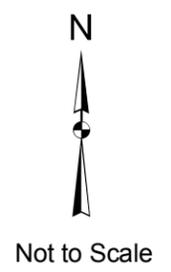
Level of Service

- LOS A - B
- LOS C
- LOS D
- LOS E
- LOS F

* Based on 2030 Socioeconomic Data

Base Map Features

- ▭ Cities/Towns
- ① Cut Line Reference Number
- - - Cut Line Over Capacity
- - - Cut Line Under Capacity



Sources: Wilson & Company, May 2007.

FIGURE 5-2



- SR 260 – south of Rim Road;
- Penrod Road – the complete length of this arterial through the Town from the city limits to Porter Mountain Road;
- Porter Mountain Road – the complete length of this arterial in the Town from SR 260 to the east city limits;
- N. Woodland Road – between SR 260 and Zuni Lane; and
- Buck Springs Road – between SR 260 and Sky Hi Road.

Certain roadway segments in the central portion of the Town would be operating at LOS 'D' or better, which is satisfactory for existing roadways. All others would be operating at LOS 'C' or better.

Figure 5-2 also shows a second level of assessment—a focused “cut-line” analysis. Cut-line analysis is a technique involving an imaginary line drawn across all of the major roadway facilities in a given travel corridor. The total traffic volume crossing the cut-line on individual roadways in the corridor is summed up. The cut-line volume represents the total demand for travel in a given direction over a broader portion of the network. The total volume is compared to available capacity to yield a volume-to-capacity (V/C) ratio. A V/C ratio greater than one means the forecast traffic volume is greater than the capacity of the roadway segments crossing the cut-line.

Cut-Lines 4 and 5 indicate the effect of 2030 traffic levels on intra- and inter-regional travel assuming no changes to the Existing-Plus-Committed roadway network. Cut-Line 4, which gauges the level of traffic in the northern corridor connecting Pinetop-Lakeside with the community of Show Low, has a V/C ratio of 2.15. These means there would be significant capacity constraints on 2030 traffic. The V/C ratio of 1.25 shown for Cut-Line 5 is more manageable. The table inset to Figure 5-2 clearly demonstrates the principal travel demand pattern in the Sub-Region is north-to-south versus east-to-west.

COMMITTED-PLUS-PLANNED ROADWAY NETWORK

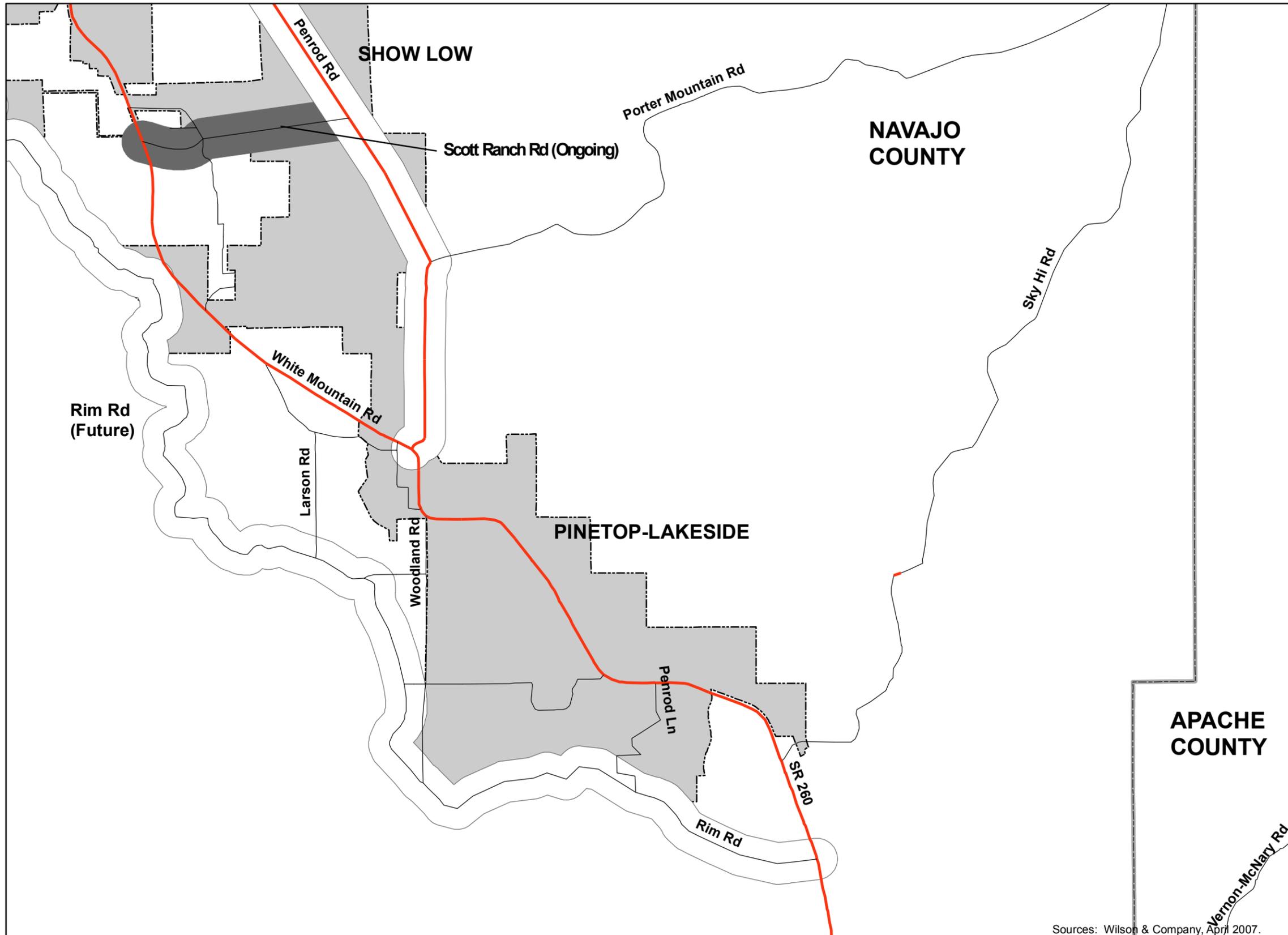
The analysis of 2030 travel demand on the Existing-Plus-Committed roadway network shows a definite need for improving existing facilities, particularly in the City’s north-south corridors. Clearly, the network will not provide adequate capacity to handle projected year 2030 travel demand within the Sub-Region without significant improvement to existing facilities and the addition of new sub-regional transportation corridors. Steady population growth is forecast for the Sub-Region and the Town of Pinetop-Lakeside through the year 2030 planning horizon. The travel demand results and cut-line analysis indicate additional capacity is needed in the Sub-Region.

Roadway Improvements

The Committed-Plus-Planned roadway network includes committed capacity improvements (cited above), new alignment and widening proposals presented in earlier planning studies, and needed widening of existing facilities. Details concerning projects to improve Sub-Region roadways are identified in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*. A map showing the Committed-Plus-Planned roadway network for the Town of Pinetop-Lakeside is presented in Figure 5-3. Specific improvements are planned within the Town of Pinetop-Lakeside, as cited below:

- Penrod Road – US 60 to south of Porter Mountain Road: Penrod Road provides sub-regional connectivity between Pinetop-Lakeside and Show Low as a parallel facility to SR 260 (White Mountain Road). Traffic volume on this roadway segment is expected to exceed 38,000 vehicles per day in year 2030. This volume is more typical of a limited access expressway than an arterial. Widening to four lanes together with strict access management control will be required to accommodate this volume at an acceptable level of service.
- Rim Road – between US 60 in Show Low and SR 260 (White Mountain Road): This planned improvement of Rim Road, enhancing connectivity to Pinetop-Lakeside, is expected to help relief congested US 60 and State highway corridors. This two-lane facility is expected to carry more than 19,000 vehicles per day on some sections.
- Porter Mountain Road – between White Mountain Road (SR 260) and Penrod Road is part of the corridor providing sub-regional connectivity between Pinetop-Lakeside and Show Low. Traffic volume on this segment is expected to 42,000 vehicles per day in year 2030. Widening to four lanes together with strict access management control will be required to accommodate this volume at an acceptable level of service.

Pinetop-Lakeside Overview



COMMITTED-PLUS-PLANNED ROADWAY NETWORK

Directional Lanes

- 1 Lane
- 2 Lanes

Improvement Scenario

- Existing-Plus-Committed
- Committed-Plus-Planned

Base Map Features

- Cities/Towns



Not to Scale

Sources: Wilson & Company, April 2007.

FIGURE 5-3

Evaluation of Roadway Network Deficiencies

Changes to other roadways in the Sub-Region can have an impact on roadways in Pinetop-Lakeside. An analysis was conducted to determine how the sub-regional roadway network likely will respond with the addition of capacity improvements in Pinetop-Lakeside and elsewhere in the Sub-Region, as identified in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*. The sub-regional Southern Navajo/Apache County Travel Demand Model transportation network was modified to incorporate the Committed-Plus-Planned improvements. A new traffic assignment was based on the same year 2030 population and employment data used for the previous assignment. The new table of forecast traffic volumes for roadway segments provided a basis for determining whether deficiencies remained in the sub-regional roadway network. This was accomplished by revising the cut-line analysis. Figure 5-4 presents a map showing the revised traffic counts for the Committed-Plus-Planned roadway network, based on 2030 socioeconomic data.

Table 5-2 summarizes the results of the cut-line analysis for the Committed-Plus-Planned roadway network with cut-lines relevant to Pinetop-Lakeside highlighted in blue (refer to Figure 5-2 for cut-line locations). The table indicates planned improvements clearly would address many of the deficiencies identified within the sub-regional Existing-Plus-Committed roadway network. In particular, sufficient capacity is anticipated along each of the east-west cut-lines with the Committed-Plus-Planned roadway network. However, key north-south arterials are still forecast to have 2030 traffic volumes in excess of their capacities.

**Table 5-2
Cut-Line Summary: Year 2030 Committed-Plus-Planned Roadway Network**

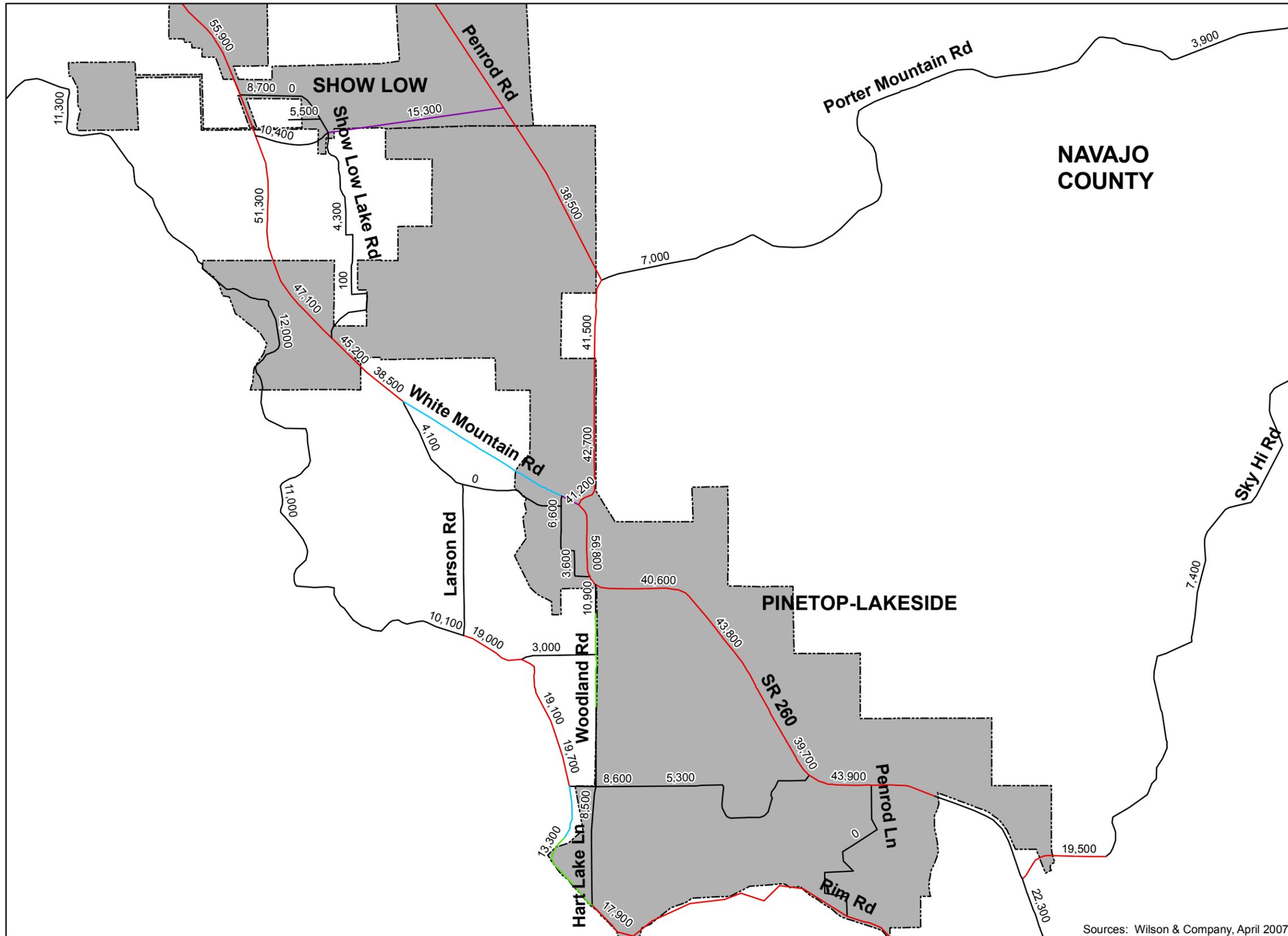
Cut-Line	Location	Roadway Capacity	Year 2030 Daily Volume	V/C Ratio
North-South Cut-Lines				
1	Town of Snowflake	35,600	37,000	1.04
2	Town of Taylor	77,800	76,000	0.98
3	Between Town of Taylor and City of Show Low	77,800	94,000	1.21
4	City of Show Low	89,000	133,000	1.49
5	Town of Pinetop-Lakeside	71,200	71,000	0.99
East-West Cut-Lines				
6	West of Towns of Snowflake and Taylor	47,800	28,000	0.59
7	West of City of Show Low	35,600	12,000	0.34
8	East of City of Show Low and Town of Pinetop-Lakeside	77,800	41,000	0.53
9	SR 61, West of Concho Highway	17,800	12,000	0.67

Source: Figure 6-6, Southern Navajo Sub-Regional Transportation Plan, Wilson & Company, August 2007.

Note: **Shading** identifies Cut-Lines relevant to the Town of Pinetop-Lakeside.

The cut-line analysis indicates substantial improvement for the northern corridor between the Town of Pinetop-Lakeside and the City of Show Low. The V/C ratio for the City’s southeast corridor (Cut-Line 4) would improve from 2.15 to 1.49; however, roadways in the corridor still would be operating over capacity. Cut-Line 5, in the central part of the Town also would show improvement over the Existing-Plus-Committed roadway network (refer to Cut-Line Summary table inset in Figure 5-2). The V/C ratio for the Woodland Road/SR 260 corridor definitely would improve with implementation of planned projects for the area, as identified in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*. Although still marginally at capacity with a V/C ratio of 0.99, the reduction from 1.25 indicates proposed improvements would be beneficial to the community. On a regional basis, V/C ratios for most cut-lines would be reduced by more than one-half.

Pinetop/Lakeside Overview



**FORECAST LEVEL OF SERVICE:
COMMITTED-PLUS-PLANNED
ROADWAY NETWORK**

Level of Service

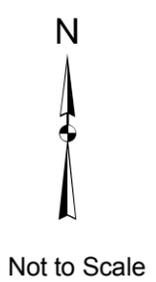
- LOS A - B
- LOS C
- LOS D
- LOS E
- LOS F

X,XXX - Daily Volume Estimate

* Based on 2015 Socioeconomic Data

Base Map Features

- ▭ Cities/Towns



Sources: Wilson & Company, April 2007.

FIGURE 5-4

ALTERNATIVE 'A' ROADWAY NETWORK

Information in the previous section indicates the Committed-Plus-Planned roadway network still will need enhanced network capacity and connectivity to facilitate efficient north-south travel in the Sub-Region.

Roadway Improvements

In consultation with the TAC, possible new Navajo County transportation corridors were added to the Committed-Plus-Planned roadway network to address this need. These potential new transportation improvements, when added to the Committed-Plus-Planned roadway network, constitute Alternative 'A'. Figures 5-5 and 5-6 show the Alternative 'A' roadway network with planned and proposed system improvements and the expected LOS for the traffic volumes shown, respectively.

There is one recommended addition to the Committed-Plus-Planned roadway network that will benefit Pinetop-Lakeside indirectly. The unused Apache Railroad R/W between US 60 east of Bourdon Ranch Road and Porter Mountain Road (not shown) offers the potential opportunity for a new north-south, two-lane collector. This facility would enhance connectivity between Pinetop-Lakeside in the south and residential growth areas in Apache County. It also would serve to relieve congested SR 260 (White Mountain Road) and Penrod Road in the northern corridor between Pinetop-Lakeside and Show Low. The Navajo/Apache County Sub-Regional Transportation Plan indicates year 2030 traffic volume on this Sky Hi Road Extension is expected to exceed 6,000 vehicles per day. Detailed information about these proposed/potential improvements may be referenced in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*.

Evaluation of Roadway Network Deficiencies

Table 5-3 compares the results of the cut-line analysis for the Committed-Plus-Planned roadway network with the improvements defined under the Alternative 'A' roadway network (cut-lines relevant to Pinetop-Lakeside are highlighted in blue). The data in the table indicate additional improvements would provide the best network performance under projected year 2030 growth projections. The V/C ratios attained with the Alternative 'A' show there would be no capacity improvement relative to the central corridor of Pinetop-Lakeside (Cut-Line 5); the V/C ratio would remain unchanged at 0.99, leaving a marginal capacity situation. There only would be very slight improvement associated with Cut-Line 4, which measured the northern corridor between Pinetop-Lakeside and Show Low.

5.1.4 YEAR 2015 MID-TERM IMPROVEMENT NEEDS

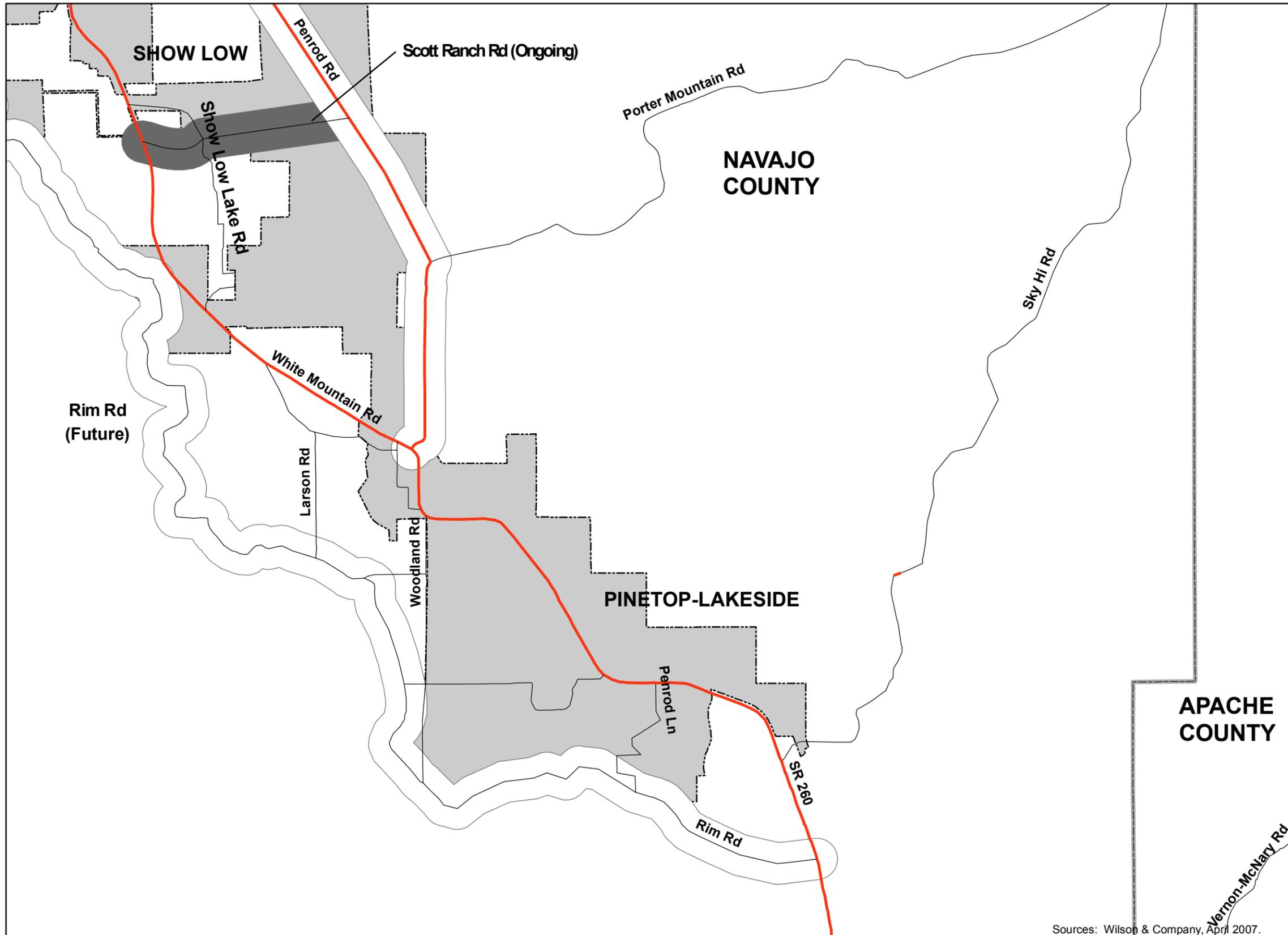
The full menu of Alternative 'A' roadway improvements was analyzed in the context of the 2015 population and employment forecasts (Appendix A) to prioritize the roadway capacity improvements needed to accommodate mid-term growth. Appendix A also presents a graphic depicting the phasing of the Alternative 'A' improvement plan in Snowflake for 2015 and 2030, and there is a map showing network traffic volumes and predicted LOS for the 2015 roadway network.

5.2 INTERSECTION ANALYSIS

As traffic volumes on roadways in the Sub-Region increase because of population and employment growth, intersection upgrades will be an important part of the overall sub-regional mobility solution. The study team conducted planning-level analyses of key existing and future intersection locations to identify lane configuration and traffic control type required to meet 2030 traffic demands. The analysis was conducted to determine both traffic control type and the intersection lane configuration needed to accommodate traffic at LOS 'D' or better.

In all, 45 intersections in the Sub-Region were analyzed for the Alternative 'A' transportation improvement scenario. The same intersections were analyzed for a subset of near-term improvement needs implemented in 2015. Six of the intersections are located in Pinetop-Lakeside (Figure 5-7). Table 5-4 shows the type of traffic for control associated with existing intersections in Pinetop-Lakeside as well as the control types anticipated to be needed intersections in 2015 and 2030. Appendix B contains figures showing for each intersection a recommended 2030 lane configuration and forecast peak-hour traffic volume estimates for 2015 and 2030.

Pinetop-Lakeside Overview



**ALTERNATIVE A
ROADWAY NETWORK**

Directional Lanes

- 1 Lane
- 2 Lanes

Improvement Scenario

- Existing-Plus-Committed
- Committed-Plus-Planned

Base Map Features

- ▨ Cities/Towns

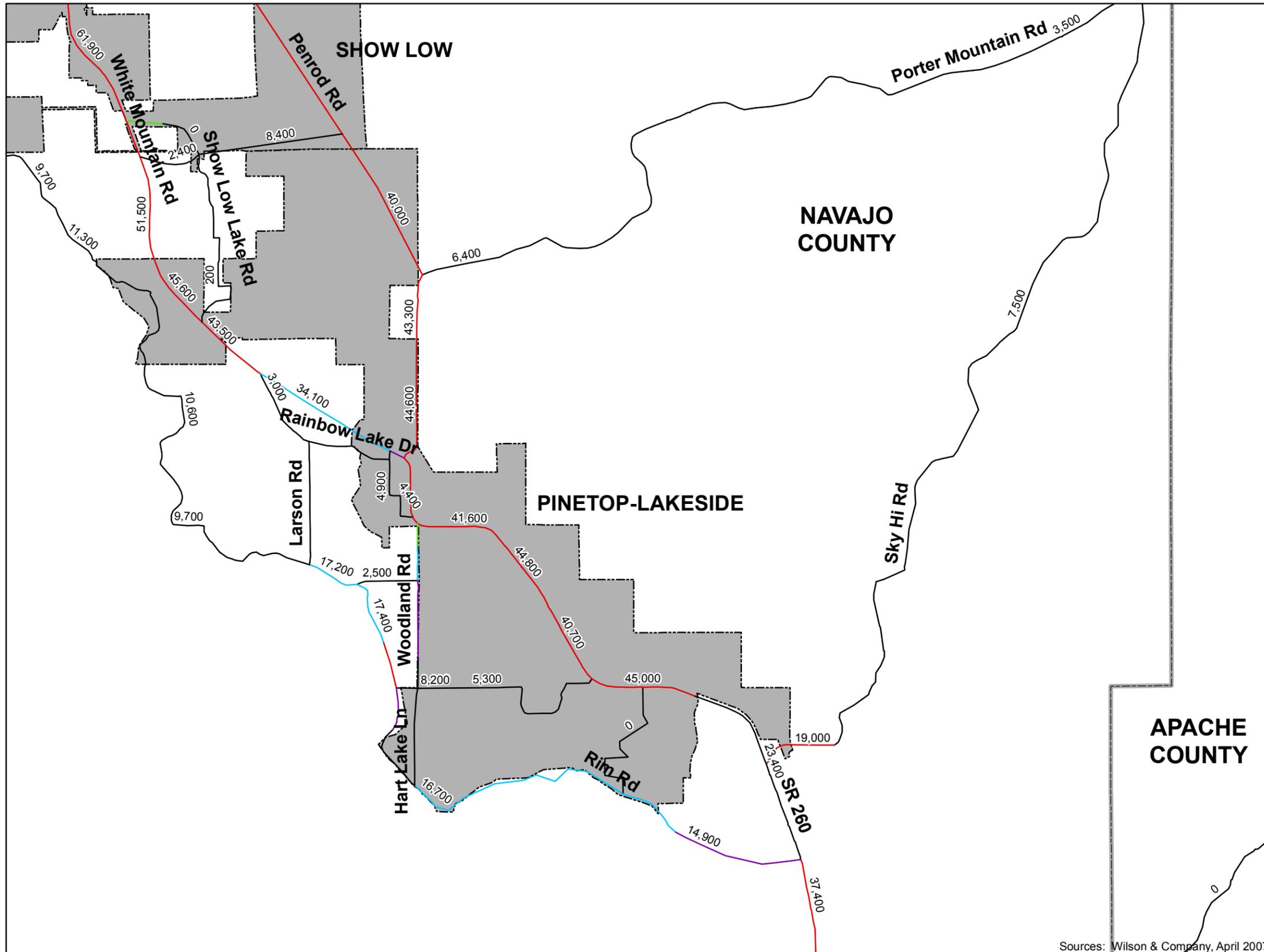


Not to Scale

FIGURE 5-5

Sources: Wilson & Company, April 2007.

Pinetop/Lakeside Overview



YEAR 2030 TRAFFIC ASSIGNMENT AND FORECAST LEVEL OF SERVICE: ALTERNATIVE A ROADWAY NETWORK

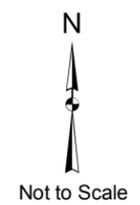
Level of Service

- LOS A - B
- LOS C
- LOS D
- LOS E
- LOS F
- X,XXX - Daily Volume Estimate

* Based on 2030 Socioeconomic Data

Base Map Features

- ▭ Cities/Towns



Sources: Wilson & Company, April 2007.

FIGURE 5-6

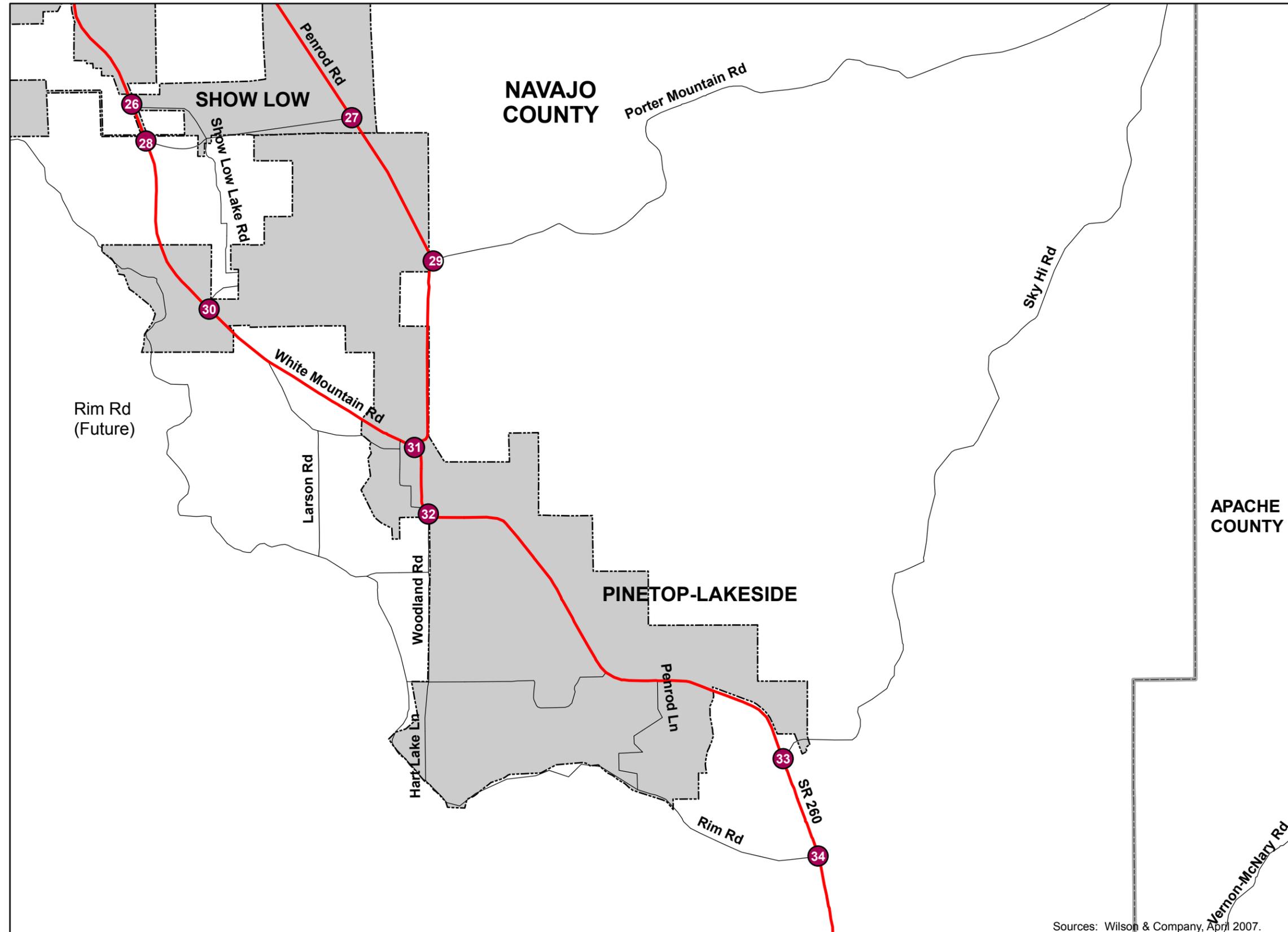
**Table 5-3
Cut-Line Analysis Comparison: Year 2030 Committed-Plus-Planned Network v. Alternative 'A' Network**

Cut-Line	Location	Year 2030 Committed-Plus-Planned Network			Alternative 'A' Network		
		Roadway Capacity	Forecast Daily Volume	V/C Ratio	Roadway Capacity	Forecast Daily Volume	V/C Ratio
North-South Cut-Lines							
1	Town of Snowflake	35,600	37,000	1.04	53,400	52,000	0.97
2	Town of Taylor	77,800	76,000	0.98	95,600	72,000	0.75
3	Between Town of Taylor and City of Show Low	77,800	94,000	1.21	95,600	100,000	1.05
4	City of Show Low	89,000	133,000	1.49	89,000	132,000	1.48
5	Town of Pinetop-Lakeside	71,200	71,000	0.99	71,200	71,000	0.99
East-West Cut-Lines							
6	West of Towns of Snowflake and Taylor	47,800	28,000	0.59	47,800	27,000	0.56
7	West of City of Show Low	35,600	12,000	0.34	35,600	11,000	0.31
8	East of City of Show Low and Town of Pinetop-Lakeside	62,800	41,000	0.65	62,800	42,000	0.67
9	SR 61, West of Concho Highway	17,800	12,000	0.67	29,000	13,000	0.45

Source: Table 6-4, Southern Navajo Sub-Regional Transportation Plan, Wilson & Company, August 2007.

Note: Shading identifies Cut-Lines relevant to the Town of Pinetop-Lakeside.

Pinetop-Lakeside Overview



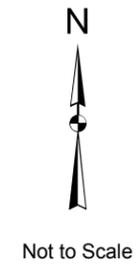
PINETOP-LAKESIDE PLANNING AREA INTERSECTIONS

Legend

-  2 Travel Lanes
-  4 Travel Lanes
-  Study Area Intersection

Base Map Features

-  Cities/Towns



Sources: Wilson & Company, April 2007.

FIGURE 5-7

**Table 5-4
Traffic Control at Pinetop-Lakeside Intersections: Existing, 2015, & 2030**

ID	Intersection	Traffic Control Type		
		Existing	Year 2015	Year 2030
29	Penrod Rd/Porter Mountain Rd	Stop	Signal	Signal
30	SR 260 (White Mountain Rd)/Show Low Lakes Rd	Stop	Stop	Signal
31	SR 260 (White Mountain Rd)/Porter Mountain Rd	Signal	Signal	Signal
32	SR 260 (White Mountain Rd)/Woodland Rd	Signal	Signal	Signal
33	SR 260 (White Mountain Rd)/Buck Springs Rd	Signal	Signal	Signal
34	SR 260 (White Mountain Rd)/Rim Rd	Stop	Stop	Signal

Source: Table 6-6, Southern Navajo Sub-Regional Transportation Plan, Wilson & Company, May 2007.

Note: **Shading** indicates changes in traffic control type from the previous period.

5.2.1 YEAR 2015 INTERSECTION PERFORMANCE

Most existing intersections in the Sub-Region should continue to function at LOS 'D' or better under existing (2006) and anticipated year 2015 traffic conditions. The intersection at Penrod Road/Porter Mountain Road (ID 29) will require signalization by 2015.

5.2.2 YEAR 2030 INTERSECTION ANALYSIS

The population and employment growth projected to occur by 2030 will require significant upgrades at most intersections in the Sub-Region. In the Town of Pinetop-Lakeside, specifically, signalization projects will be needed at two intersections to assure LOS 'D' performance:

- SR 260 (White Mountain Road)/Show Low Lakes Road (ID 30); and
- SR 260 (White Mountain Road)/Rim Road (ID 34).

6.0 IMPLEMENTATION PLAN

This section establishes the overall framework for the Town of Pinetop-Lakeside Community Transportation Plan. It includes the following elements:

- Future Roadway Functional Classification Plan
- Year 2030 Roadway Improvement Plan
- Transportation Revenue Sources
- Implementation Action Items.

The recommendations for each of these elements are based on the technical analyses of existing and future transportation conditions presented in the previous sections as well as input from the TAC.

6.1 FUTURE ROADWAY FUNCTIONAL CLASSIFICATION PLAN

The Future Roadway Functional Classification Plan, shown for the Town of Pinetop-Lakeside (Figure 6-1) is based on the 1999 *White Mountain Regional Transportation Plan*, as updated by the travel demand analysis for 2030 presented in the previous sections of this report. The Future Roadway Functional Classification Plan establishes the overall design framework to guide development of Pinetop-Lakeside's roadway network over the planning period through 2030. Each major roadway is classified according to four principal roadway classifications: Principal Arterial, Minor Arterial, Major Collector, and Minor Collector.

The protection of R/W is critical for implementing future roadway improvements needed to accommodate forecast 2030 travel demand. The functional classifications shown in Figure 6-1, therefore, establish a basis for requiring the necessary R/W to construct roadway to the full design cross-sections specified in Section 2. Specific R/W requirements for each planned roadway should be considered when reviewing future development proposals.

6.2 YEAR 2030 ROADWAY IMPROVEMENT PLAN

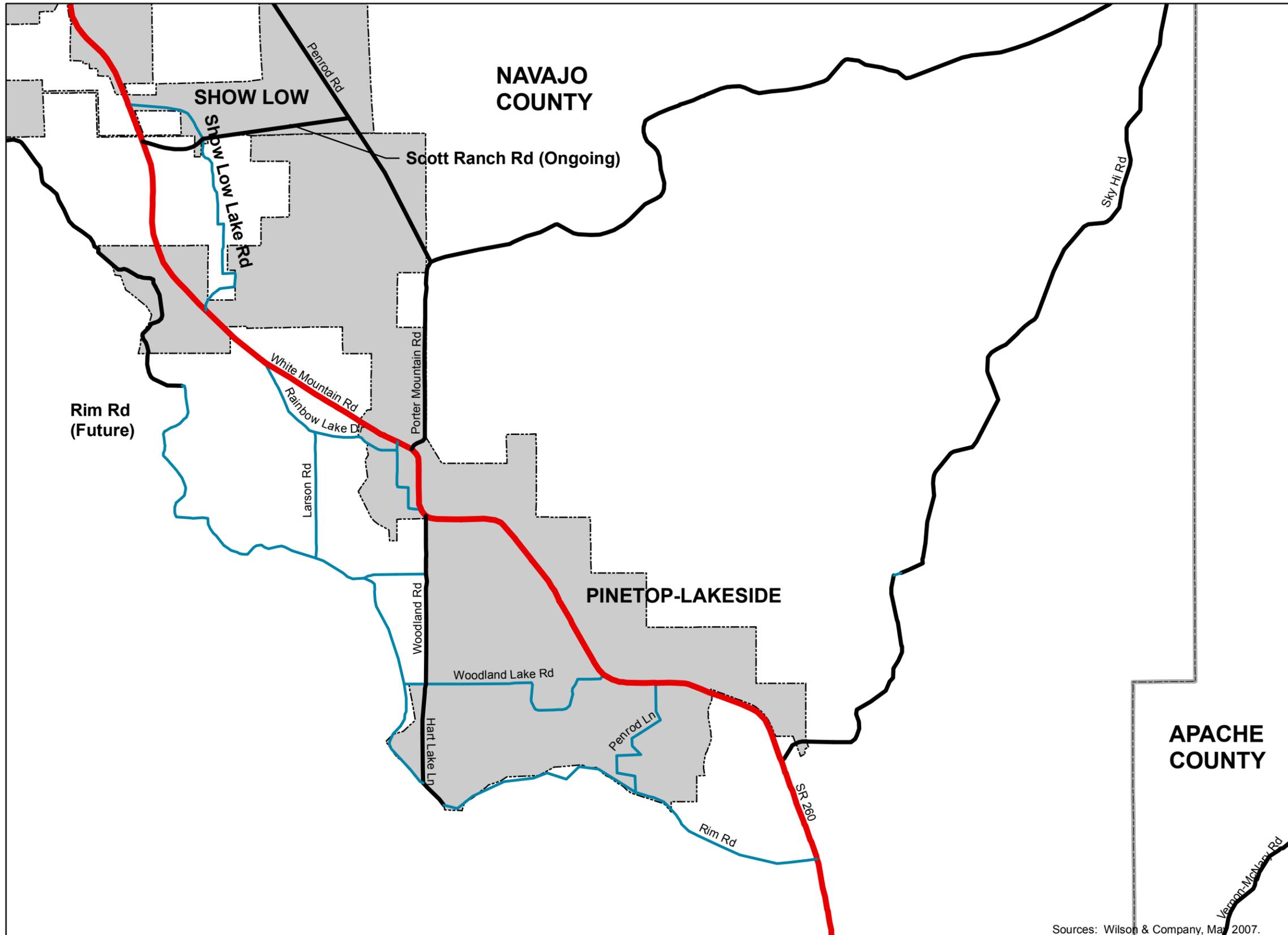
This Year 2030 Roadway Improvement Plan (Figure 6-2) includes the improvement needs defined by Alternative 'A', as discussed in Section 5 of this report. Based on the analyses conducted, these improvement recommendations should assure adequate roadway system capacity to handle the 2030 travel demand in the Sub-Region and in the Town of Pinetop-Lakeside. It is important to note that the Year 2030 Roadway Improvement Plan is not expected fully to accommodate the seasonal influx of visitors experienced annually by the Sub-Region and the Town of Pinetop-Lakeside. Thus, study participants and the TAC understand and expect the roadway system defined by Alternative 'A' will operate over capacity in several key corridors as a result of the seasonal increase in traffic.

Table 6-1 lists eight roadway improvement projects that would have direct impact on Pinetop-Lakeside's transportation system, as specified for the Year 2030 Roadway Improvement Plan reported in the *Southern Navajo/Apache County Sub-Regional Transportation Plan*. Roadway improvements are defined in terms of their location, roadway capacity needs, planning-level capital cost estimate, and recommended time horizon for implementation. The total estimated cost in 2006 dollars of all improvements of \$102,463,600 includes planning, design, construction management, and R/W acquisition. Estimated capital costs for roadway improvements planned by the Town of Pinetop-Lakeside (highlighted in blue) total \$45,456,400. The capital cost estimates presented in Table 6-1 assume an average cost of \$1,270,000 per lane mile in 2006 dollars, which is based on year 2006 Maricopa County Department of Transportation (MCDOT) cost data presented in the MCDOT Transportation System Plan Update, 2006. When an existing two-lane roadway showed a need to be upgraded to four travel lanes, it was assumed that the entire facility would be reconstructed.

6.3 TRANSPORTATION REVENUE OUTLOOK

Existing and potential revenues available for funding the recommended Year 2030 Roadway Improvement Plan are briefly described below.

Pinetop-Lakeside Overview



**FUTURE ROADWAY
FUNCTIONAL
CLASSIFICATION PLAN**

Roadway Classifications

- Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector

Base Map Features

- Cities/Towns
- Traffic Interchange

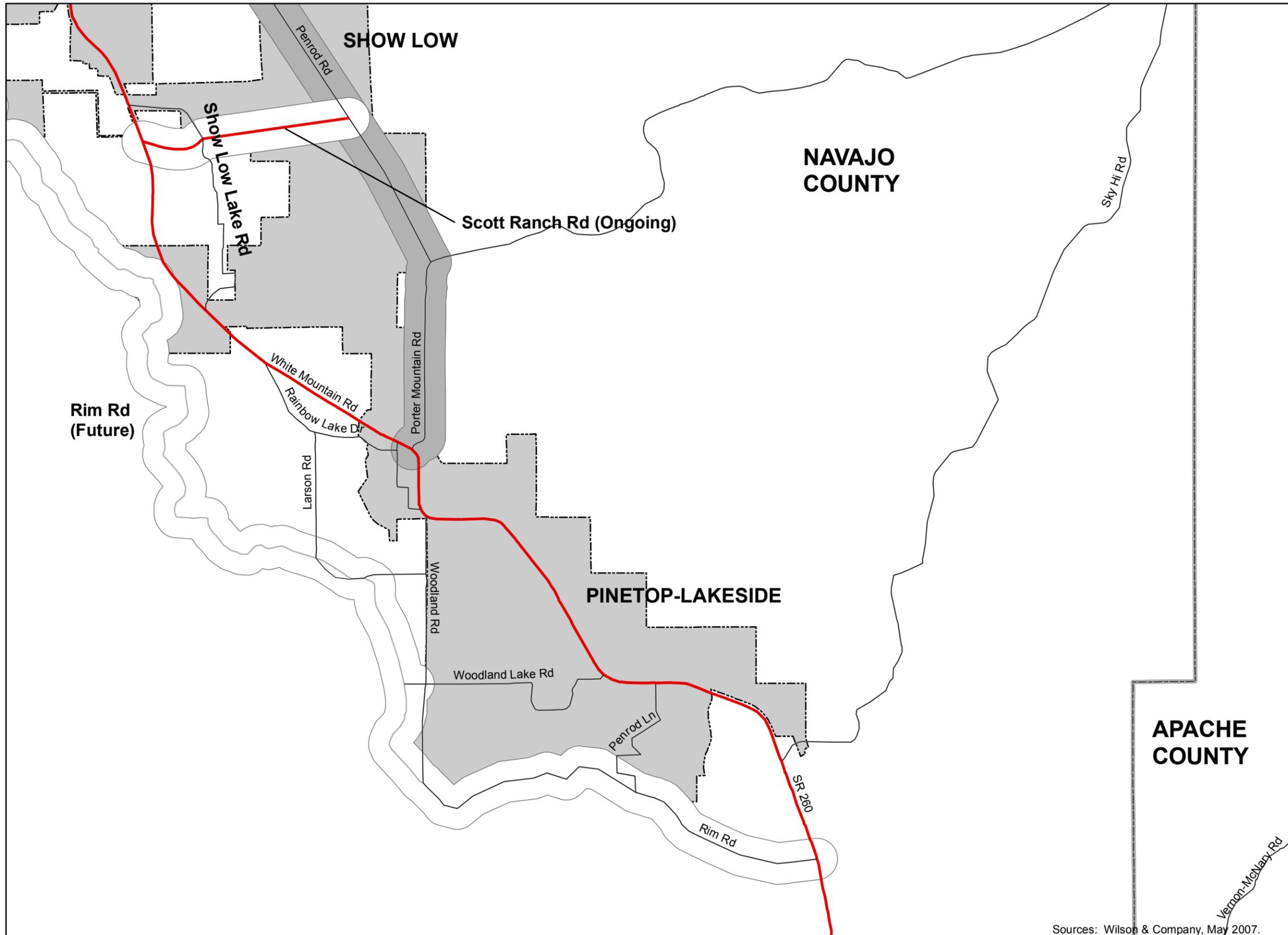


Not to Scale

Sources: Wilson & Company, May 2007.

FIGURE 6-1

Pinetop-Lakeside Overview



**YEAR 2030
ROADWAY
IMPROVEMENT PLAN**

Existing Roadway Network

- 2 Lanes
- 4 Lanes

Future Network Improvement

- 2 Lanes
- 4 Lanes
- New Traffic Interchange

Base Map Features

- ▭ Cities/Towns



Not to Scale

Sources: Wilson & Company, May 2007.

FIGURE 6-2

**Table 6-1
Town of Pinetop-Lakeside Planning Area Roadway Improvement Needs**

Street Name	From	To	Length (Mi.)	Existing Travel Lanes	Needed Travel Lanes	Improvement Cost Estimate (2006 dollars) *	Recommended Priority	Jurisdiction
East-West Facilities								
Porter Mountain Rd	SR 260 (White Mountain Rd)	Penrod Rd	1.75	2	4	\$ 8,890,000	Mid-Range	Pinetop-Lakeside
Rim Rd	SR 260 (White Mountain Rd)	Show Low City Limits	11.40	0	2	\$ 28,956,000	Long-Range	Pinetop-Lakeside
North-South Facilities								
Sky Hi Rd Extension	Porter Mountain Rd	US 60	4.50	0	2	\$ 11,430,000	Long-Range	Navajo County
Porter Mountain Rd	SR 260 (White Mountain Rd)	Penrod Rd	0.90	2	4	\$ 4,572,000	Long-Range	Navajo County
Penrod Rd	Porter Mountain Rd	Show Low City Limits	1.50	2	4	\$ 7,620,000	Mid-Range	Pinetop-Lakeside
Scott Ranch Rd	SR 260 (White Mountain Rd)	Penrod Rd	1.94	0	2	\$ 4,927,600	Short-Range	Show Low
Penrod Rd	Pinetop-Lakeside City Limits	US 60 (Deuce of Clubs)	4.60	2	4	\$ 23,368,000	Mid-Range	Show Low
Rim Rd	Pinetop-Lakeside City Limits	US 60	5.00	0	2	\$ 12,700,000	Long-Range	Show Low
Total Estimated Improvement Need						\$ 102,463,600		

Source: Table 7-2, Southern Navajo Sub-Regional Transportation Plan, Wilson & Company, May 2007.

Notes:

* Planning-level construction cost estimates include: allowances for planning, design, construction management, and right-of-way.

Shading identifies those improvement projects within the jurisdiction of the Town of Pinetop-Lakeside.

- **Highway User Revenue Fund (HURF).** This is the principal source of funding for roadway construction and maintenance in Arizona. HURF revenues come from a variety of sources including state motor fuel taxes, motor carrier taxes, vehicle registration fees and a portion of vehicle license taxes. These funds are distributed by formula to every city and county in the state and to ADOT. The State Constitution earmarks HURF funds exclusively for street and highway purposes.
- **Local Transportation Assistance Fund (LTAF).** The LTAF provides State Lottery proceeds to cities and towns for transportation improvements. LTAF funds are allocated using a population-based formula.
- **Federal Highway Funds.** Federal Highway Funds are apportioned in accordance with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) enacted by Congress in year 2005.
- **Developer Impact Fees.** Navajo County is currently starting the process to establish a development impact fee to help fund roadway infrastructure needed to accommodate growing travel demand. The City of Show Low and the Towns of Pinetop-Lakeside and Snowflake also are considering a development impact fee for transportation.
- **Half-Cent Sales Tax.** Another funding alternative is a half-cent sales tax dedicated to transportation improvements. It is authorized in Arizona Revised Statute 42-1484: *County Transportation Excise Tax For Roads; Counties with Population of Four Hundred Thousand or Fewer Persons.* This revenue stream could have a significant role in funding the transportation improvements identified in this study.

6.4 IMPLEMENTATION ACTION ITEMS

The principal action items required to support and implement key elements of the Year 2030 Roadway Improvement Plan include: on-going stakeholder coordination; maintaining a current database of traffic information; conducting key corridor studies; participating in regional planning efforts; and periodically updating this transportation study.

6.4.1 STAKEHOLDER COORDINATION

An important part of the long-term roadway improvement plan outlined in this report is continued coordination between the State, the County, and the Town of Pinetop-Lakeside. The White Mountain Regional Transportation Committee is an effective forum for coordinating timely improvements to the State Highway System to ensure regional mobility as growth occurs.

6.4.2 CORRIDOR STUDIES

Protection of R/W for future roadways is essential to maintaining the integrity of the planned high-capacity regional and sub-regional roadways identified in this long-range transportation plan. Corridor studies typically are the vehicle for identifying the required roadway R/W footprint, intersection configurations, bridges and other drainage needs, and potential environmental concerns. It is recommended that the Town of Pinetop-Lakeside, in partnership with other key stakeholders in the Sub-Region, undertake detailed engineering studies to define and evaluate the following corridors:

- Rim Road, between US 60 southwest of Show Low and SR 260 (White Mountain Road) south of Pinetop-Lakeside;
- Scott Ranch Road, SR 260 to Penrod Road proximate to the boundary between Pinetop-Lakeside and Show Low; and
- Sky Hi Road Extension on Apache Railroad right-of-way, between US 60 and Porter Mountain Road.

These studies would be an essential tool in working with adjacent jurisdictions, ADOT, and the development community to maintain the integrity of future transportation corridors.

6.4.3 ROADWAY SAFETY REVIEW

The Town of Pinetop-Lakeside should conduct periodic reviews of roadway accident data to identify safety trends.

6.4.4 TRAFFIC DATA COLLECTION

Permanent traffic count stations should be established at strategic locations to collect data on the daily, weekly, and annual variations in traffic volumes. Data from permanent count stations would be a valuable resource to engineers and planners establishing transportation infrastructure needs. The Town of Pinetop-Lakeside also should continue updates of traffic conditions through periodic roadway inventories and/or an annual system-wide traffic count program.

6.4.5 HOUSEHOLD TRAVEL SURVEY

To provide more accurate travel demand forecasts, the Town of Pinetop-Lakeside should participate in a household travel survey focusing on the southern Navajo/Apache County Sub-Region. This household travel survey would seek to measure sub-regional trip making characteristics. It would collect data on trip generation, trip length, and modal choice for both the permanent and seasonal populations. Comprehensive and current travel data would enable future studies to establish peak-season travel demand forecasts. Because transit will have an important role in future mobility solutions; data from a travel survey also would enable analysis of mode choice.

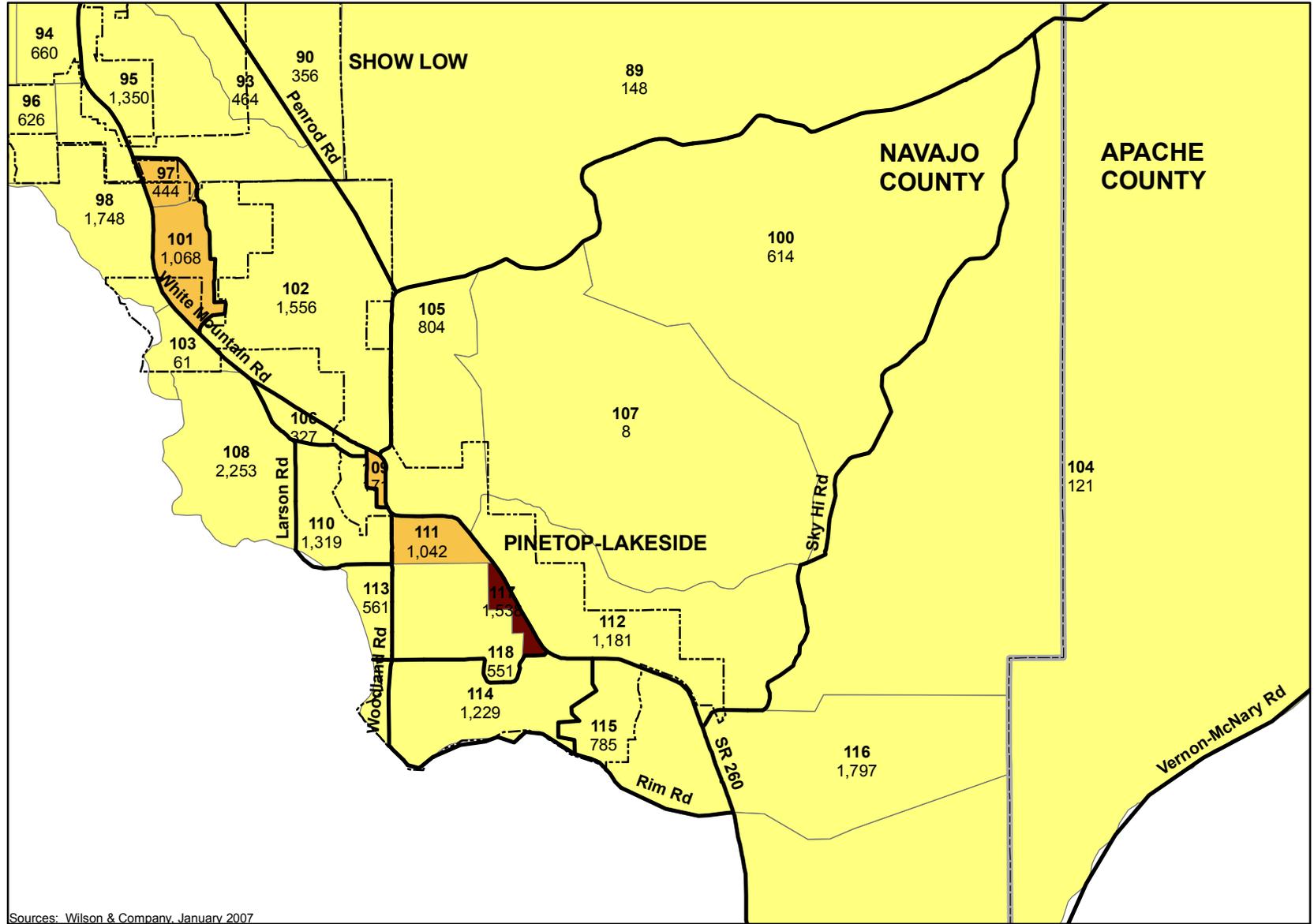
6.4.6 MONITOR AND UPDATE SUB-REGIONAL TRAVEL DEMAND MODEL AND TRANSPORTATION PLAN

To facilitate periodic updates of the sub-regional travel demand model and project prioritization analysis, the Town of Pinetop-Lakeside should strive to maintain current DU and employment databases. Significant changes in development patterns should trigger an update of the travel demand forecasts for the Sub-Region. At a minimum, a major review of this transportation plan should be undertaken every five years.

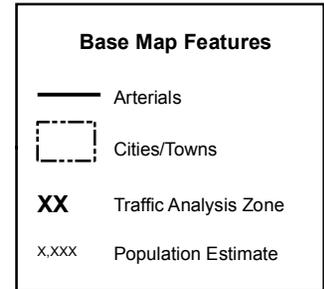
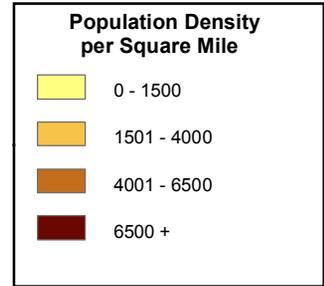
APPENDIX A

Year 2015 & Year 2030 Phased Roadway Improvements

Pinetop-Lakeside Overview



YEAR 2015 ESTIMATED POPULATION DENSITY BY TRAFFIC ANALYSIS ZONE



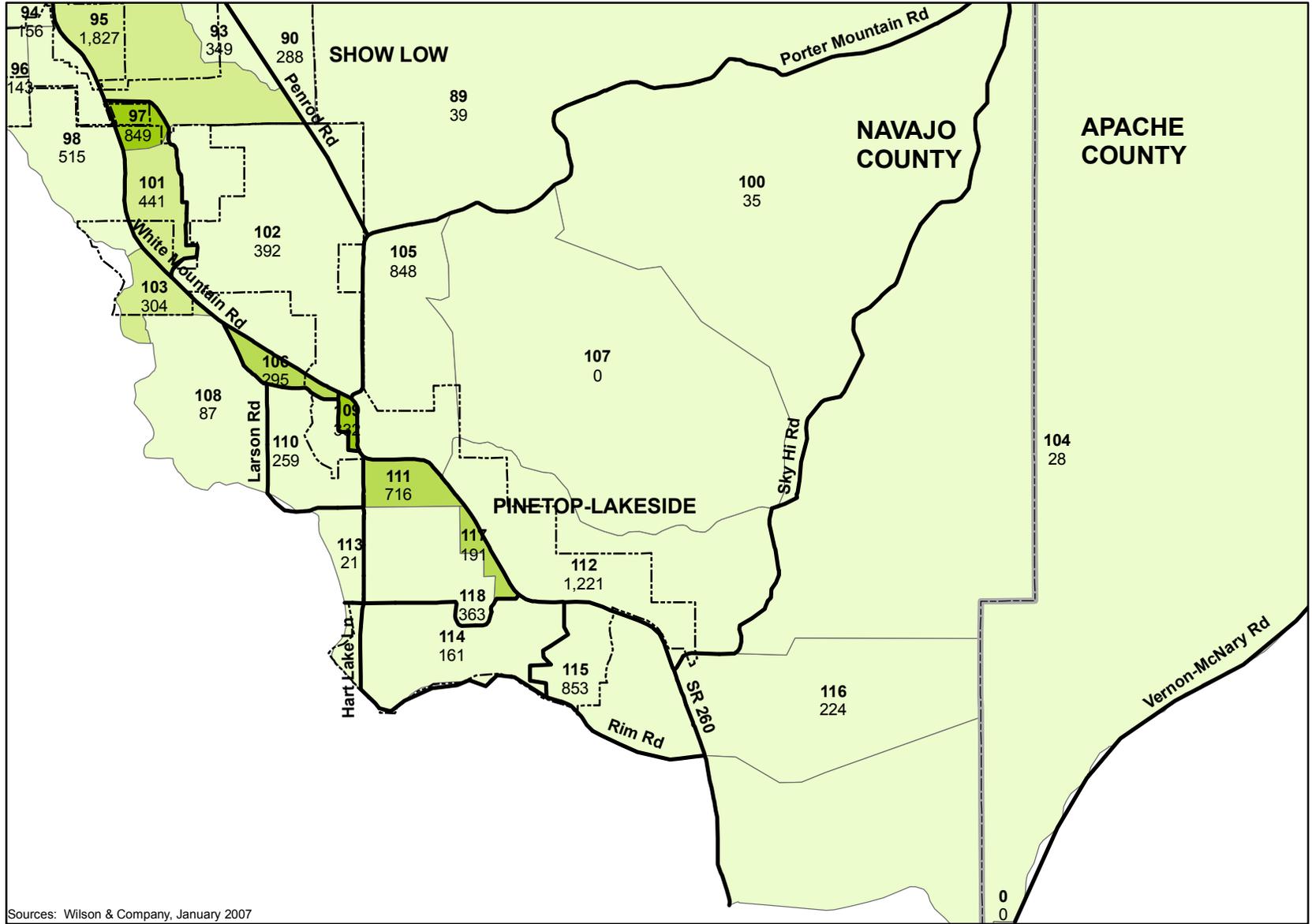
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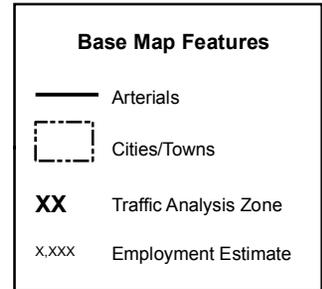
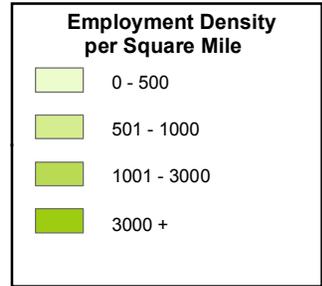
Sources: Wilson & Company, January 2007

FIGURE A-1

Pinetop-Lakeside Overview



YEAR 2015 ESTIMATED EMPLOYMENT DENSITY BY TRAFFIC ANALYSIS ZONE



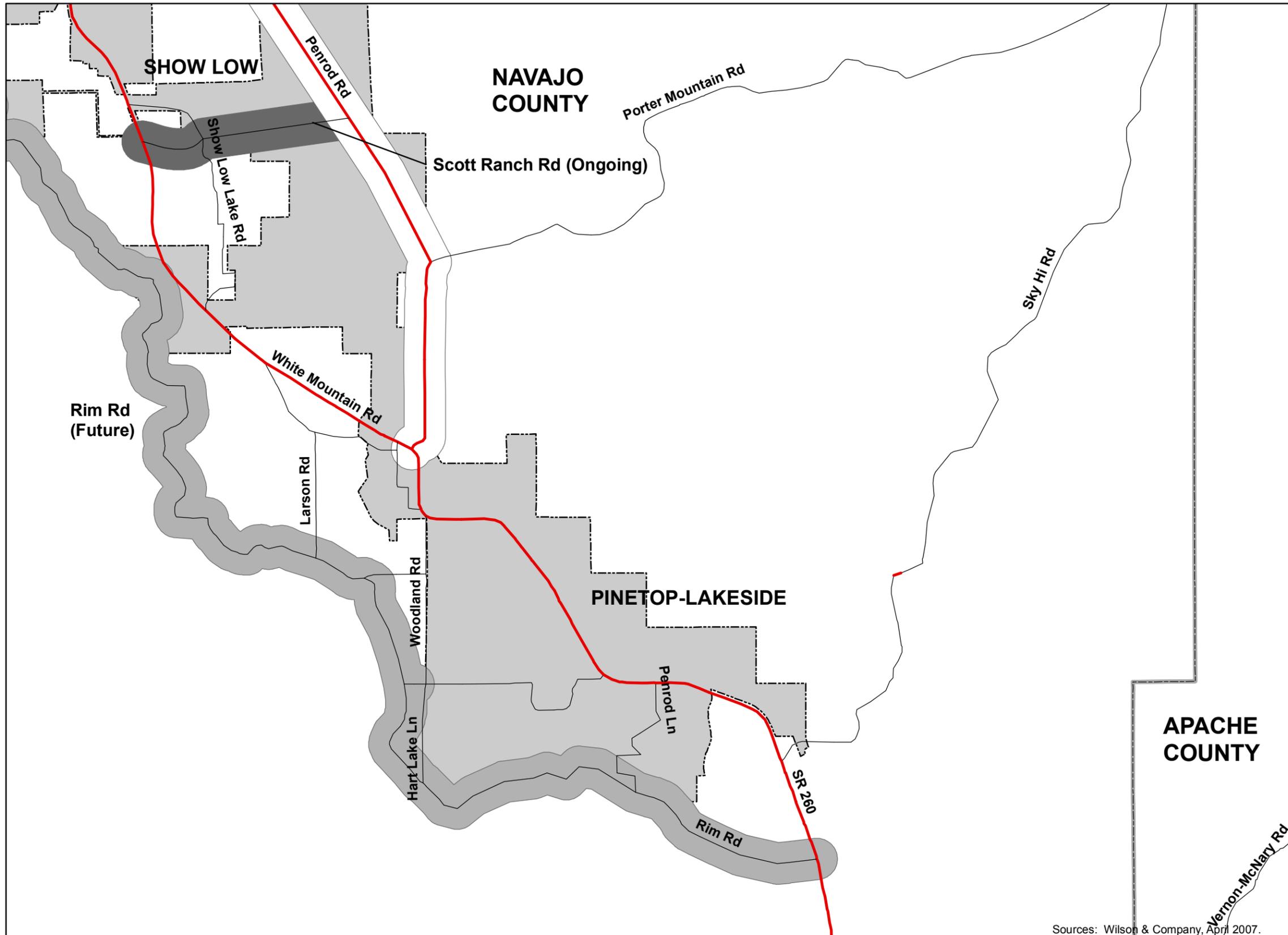
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Sources: Wilson & Company, January 2007



FIGURE A-2

Pinetop-Lakeside Overview



**PHASED ROADWAY IMPROVEMENTS:
2015 AND 2030**

Directional Lanes

- 1 Lane
- 2 Lanes

Improvement Phase

- Existing-Plus-Committed
- Year 2015
- Year 2030

Base Map Features

- Cities/Towns

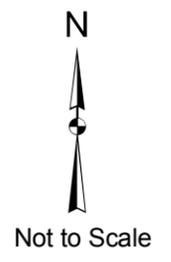
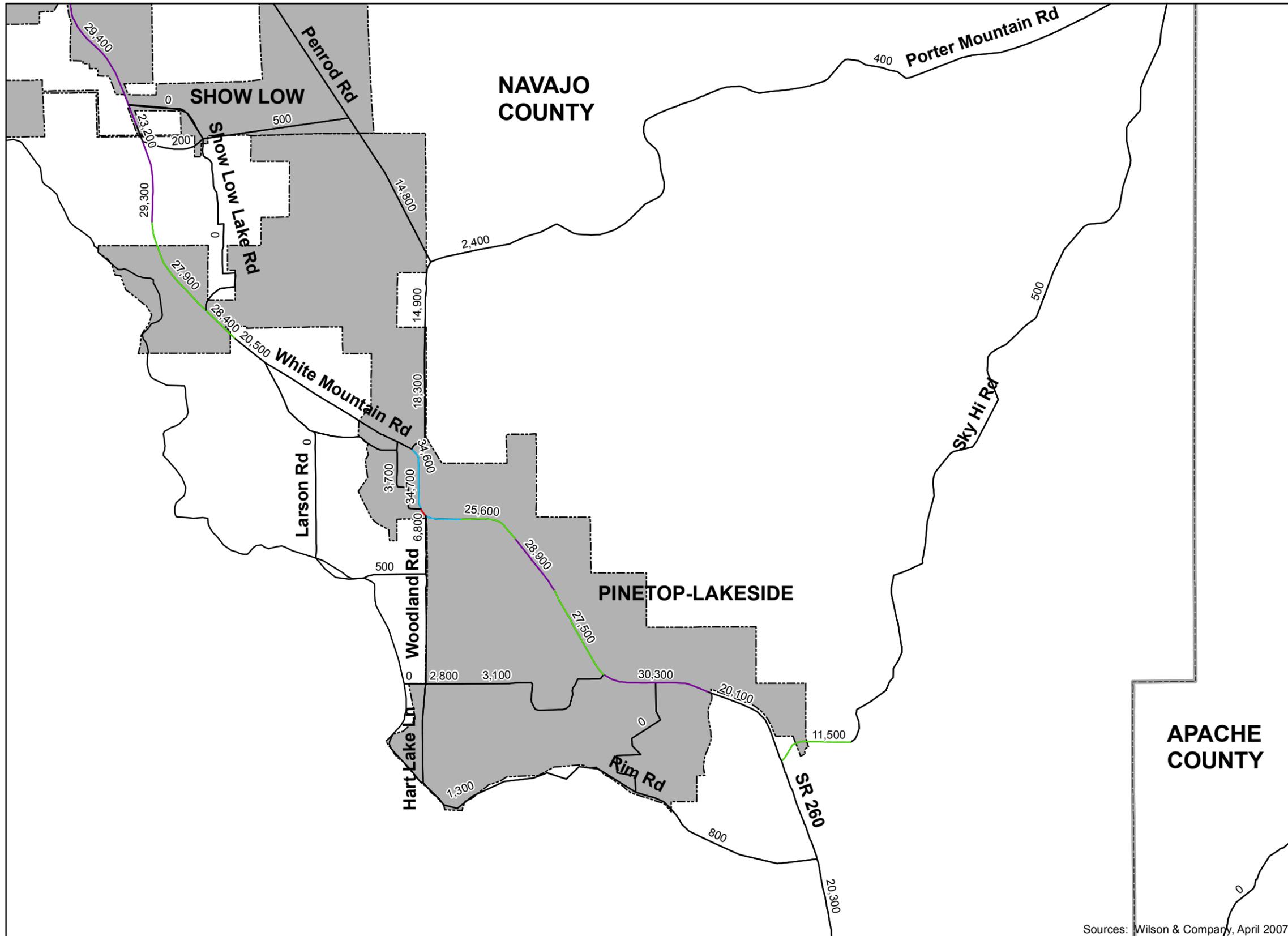


FIGURE A-3

Pinetop/Lakeside Overview



FORECAST LEVEL OF SERVICE:
YEAR 2015 IMPROVEMENTS

Level of Service

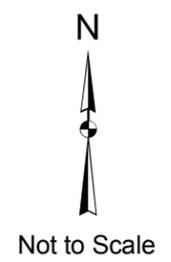
- LOS A - B
- LOS C
- LOS D
- LOS E
- LOS F

X,XXX - Daily Volume Estimate

* Based on 2015 Socioeconomic Data

Base Map Features

- ▭ Cities/Towns

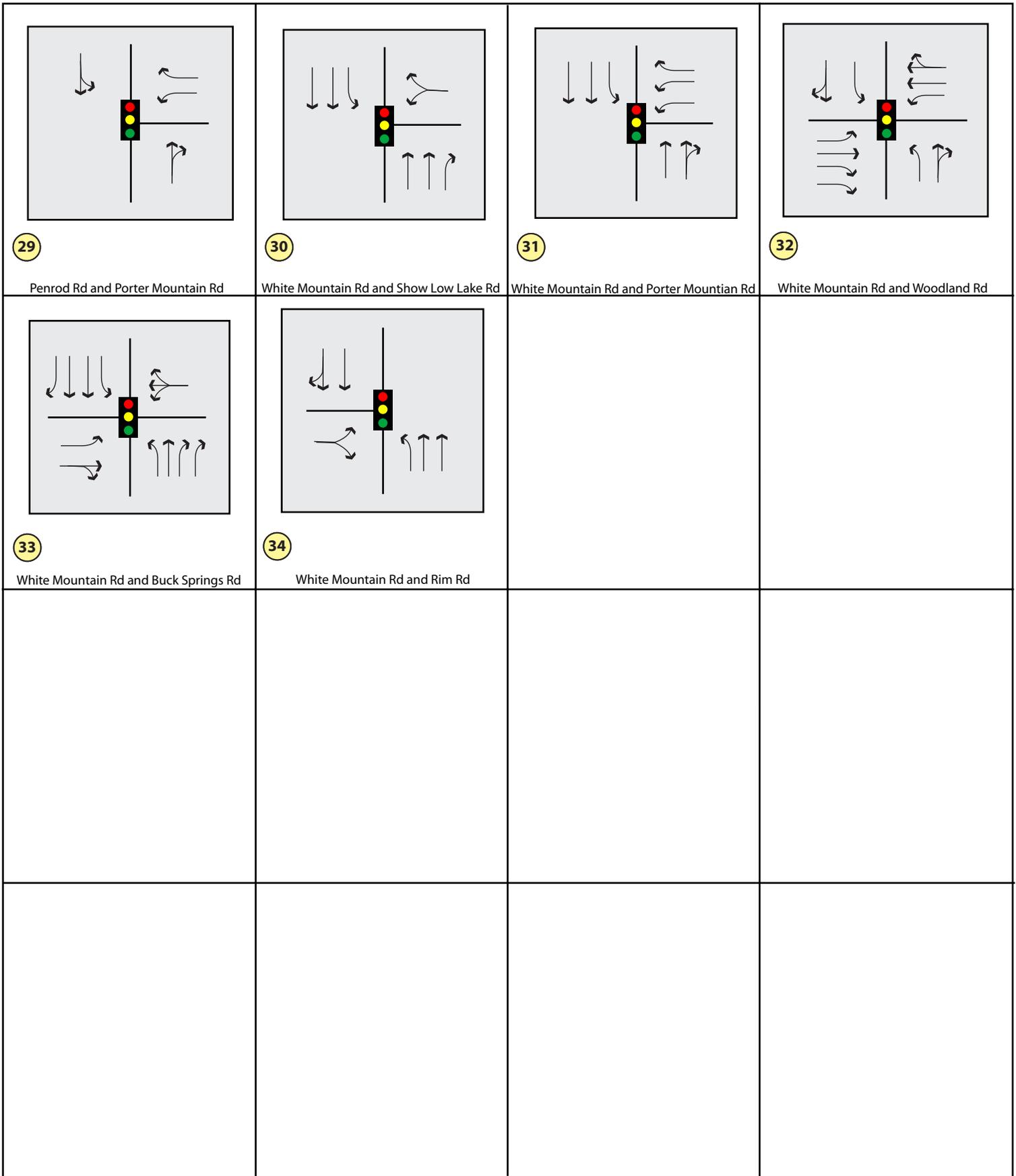


Sources: Wilson & Company, April 2007.

FIGURE A-4

APPENDIX B

Intersection Lane Configuration and Forecast Peak-Hour
Traffic Volume Estimates

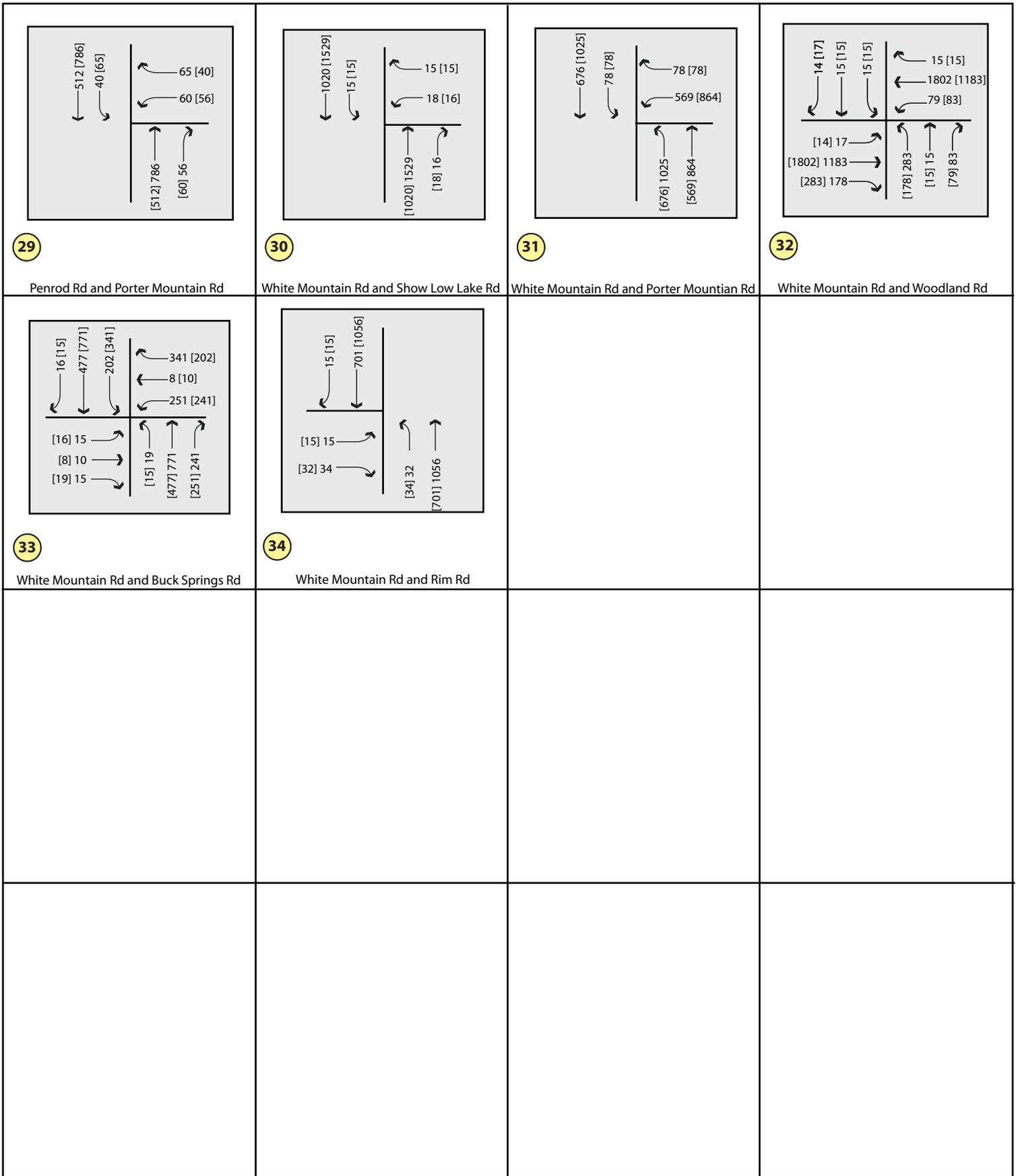


X = Key Study Area Intersection
 xx = AM Peak Hour Volume
 [xx] = PM Peak Hour Volume

Source: Wilson & Company, May, 2007.



No Scale



29

Penrod Rd and Porter Mountain Rd

30

White Mountain Rd and Show Low Lake Rd

31

White Mountain Rd and Porter Mountain Rd

32

White Mountain Rd and Woodland Rd

33

White Mountain Rd and Buck Springs Rd

34

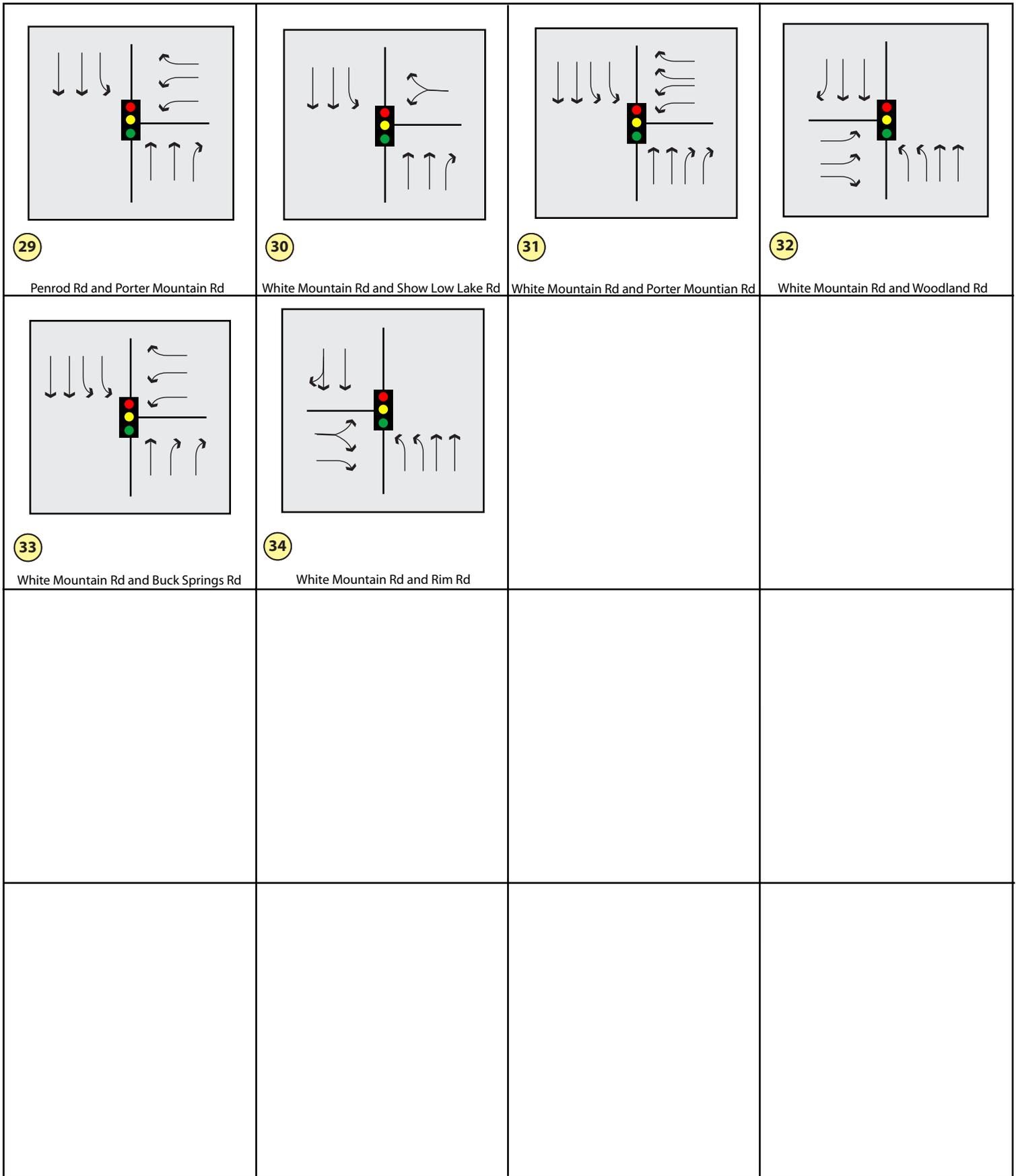
White Mountain Rd and Rim Rd

Source: Wilson & Company, May, 2007.

- X = Key Study Area Intersection
- xx = AM Peak Hour Volume
- [xx] = PM Peak Hour Volume



No Scale

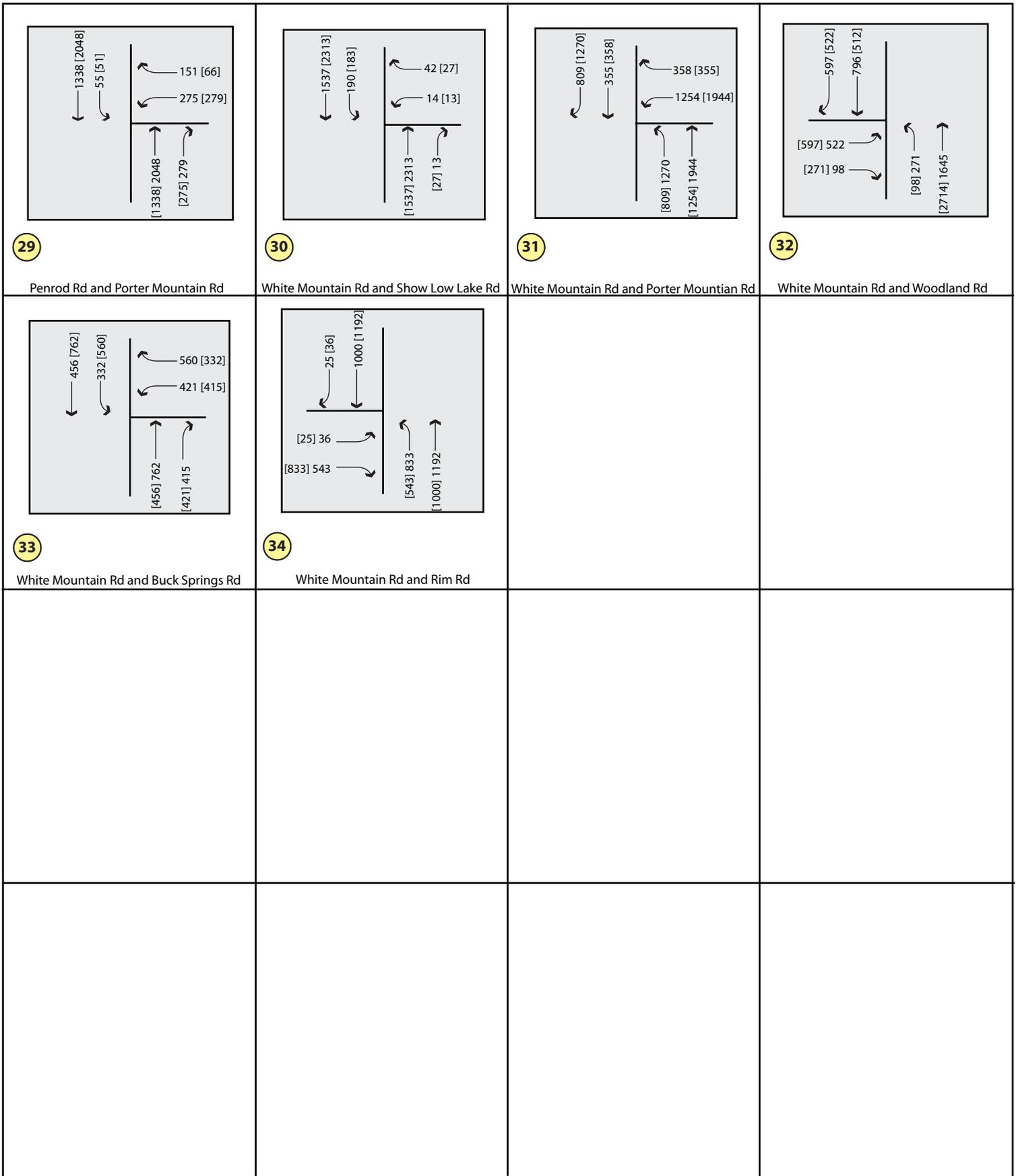


X = Key Study Area Intersection
 xx = AM Peak Hour Volume
 [XX] = PM Peak Hour Volume

Source: Wilson & Company, May, 2007.



No Scale



Source: Wilson & Company, May, 2007.

X = Key Study Area Intersection
 xx = AM Peak Hour Volume
 [xx] = PM Peak Hour Volume



No Scale