FINAL REPORT

CENTRAL YAVAPAI METROPOLITAN PLANNING ORGANIZATION
REGIONAL TRANSPORTATION STUDY

Prepared for: Central Yavapai Metropolitan Planning Organization

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DRAFT FINAL REPORT OUTLINE

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1. INTRODUCTION

REGIONAL OVERVIEW

Central Yavapai County is located approximately 80 miles northwest of Phoenix and is served by State Routes (SR) 69, 169, 89 and 89A. State Route 69 connects with Interstate 17 (I-17) at Cordes Junction, about 20 miles southeast of the study area. The Central Yavapai Metropolitan Planning Organization (CYMPO) encompasses the communities of Prescott, Prescott Valley, Chino Valley, Dewey-Humboldt, portions of Yavapai County and the Yavapai-Prescott Nation. Figure 1 shows the location of these communities, the CYMPO planning area, and the study area boundaries. The study area boundaries are larger than the MPO boundaries to encompass influence areas outside the immediate metropolitan area.

The CYMPO is one of the fastest growing areas in Arizona. Prescott currently has the largest population of the three communities. However, Prescott Valley is close behind and is projected to surpass Prescott in size by 2015. As Figure 1 shows, Prescott is located in the west-central portion of the region; Prescott Valley lies east of Prescott, Chino Valley lies to the north of Prescott, and newly incorporated Dewey-Humboldt is just south of Prescott Valley at the intersection of SR 169 and SR 69. State Routes 69, 89, and 89A serve as the main thoroughfares within the CYMPO, tie the communities together, and also function as important commercial corridors within each community—an important dual role that this study addressed.

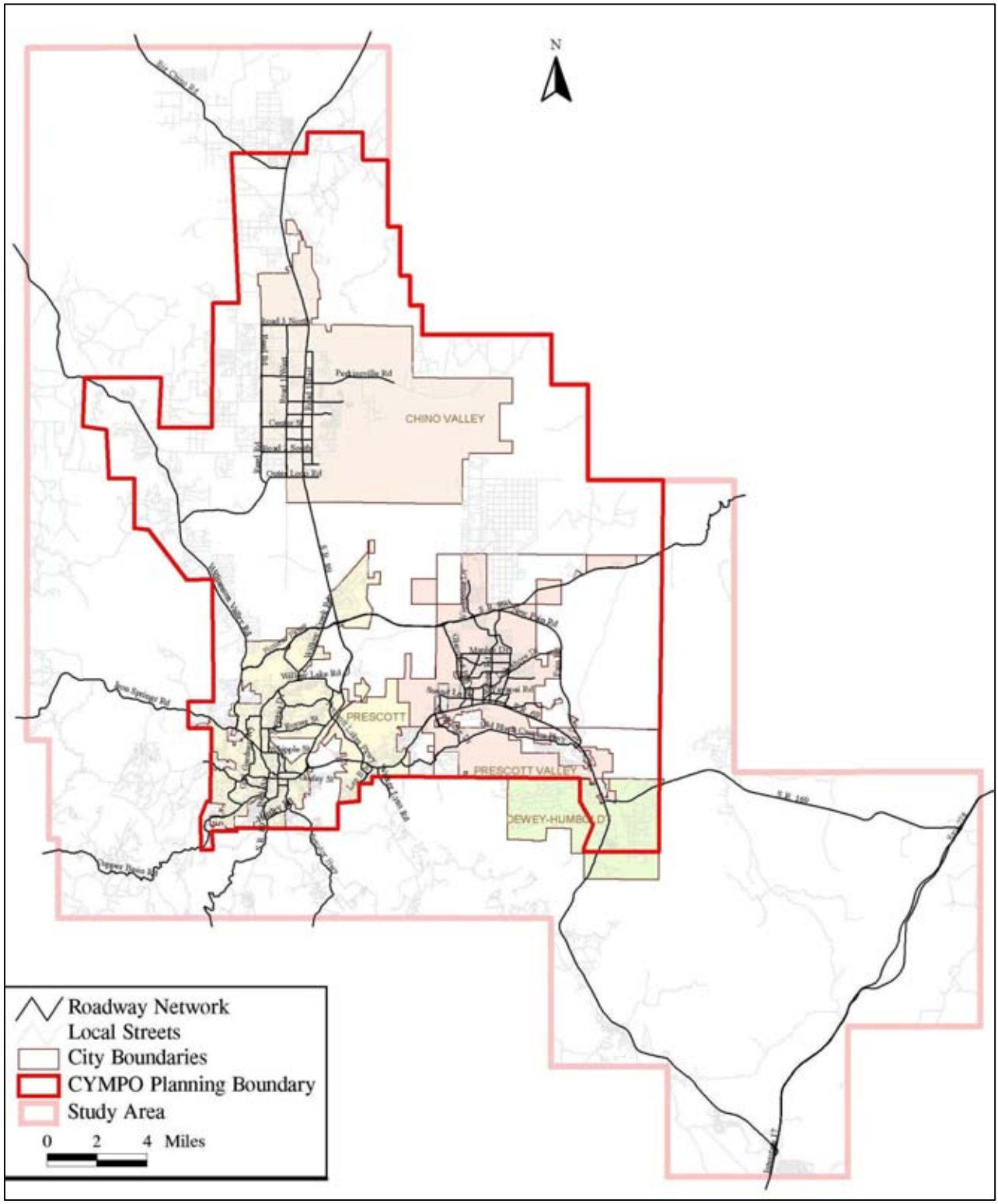
STUDY PURPOSE

This study is the latest in a series of regional planning efforts that have been conducted in the region, beginning with the 1995 Central Yavapai County Transportation Study and the subsequent 1998 update of that study. Although the Central Yavapai region was just recently designated a Metropolitan Planning Organization, the communities within the region have worked together in the past to tackle regional issues, successfully implementing many of the roadway improvements recommended in the 1995 Plan.

The scope of this study is the creation of a regional transportation plan for the 2015 and 2030 planning horizon years, together with a program of short-range projects for 2010. The study includes five major elements:

- Public Involvement
- Current Socioeconomic and Transportation Conditions
- Documentation of a TransCAD Travel Demand Model
- Analysis of Future Conditions
- Multimodal Assessment

FIGURE 1. STUDY AREA



AGENCY COORDINATION AND PUBLIC PARTICIPATION

Public involvement for this study included public meetings and extensive coordination meetings with the City of Prescott, the Towns of Prescott Valley and Chino Valley, Yavapai County, the Yavapai-Prescott Nation and Arizona Department of Transportation (ADOT).

November 2005

The first series of public meetings was held in November 2005 to present findings on the existing and future conditions and to obtain input on the study issues. Excluding the consultant team who conducted the sessions, a total of over 100 persons attended the first set of four open house events. The Prescott afternoon session had the highest attendance—over 40 persons. The Prescott Valley session had the lowest recorded attendance—21, although a count conducted during the session indicated that 25 persons were actually in attendance. Thirty-nine comment forms were completed and returned during the sessions. Another half-dozen comments were received later by e-mail. Tables 1 presents a summary of the public comments.

TABLE 1. SUMMARY OF PUBLIC COMMENTS
November 15, 16, and 17, 2005

Public Comments	Disposition of Comments
Chino Valley **23 Participants**	
• Please read the proposed Williamson Valley Road plan	All pertinent existing plans including those for Williamson Valley Road have been reviewed by the consultant.
• The Williamson Valley corridor character would be severely impacted by widening the road	Comment referred to local jurisdictions for further disposition. The plan is regional in scope.
• Add east-west roads between Highway 89 and Williamson Valley Road	Several east-west alignments were tested in the traffic forecasting process to evaluate the effect on traffic volumes on Williamson Valley Road
• Extend Glassford Hill Road north from Prescott Valley	Extension included in draft plan
Prescott Valley **21 Participants**	
• The "multimodal facility" along Highway 69 is not open. There are barricades at intersections. Why is it not open? Why was it built where there is little foot traffic?	Comment referred to the Town of Prescott Valley for further disposition.
• Need large signs on SR 69 from SR 169 to SR 89 that tell truckers they must stay in the right (outer) lane except to pass. Also slower traffic must stay in outer lane for the same reason.	Comment referred to ADOT for further disposition.

TABLE 1. SUMMARY OF PUBLIC COMMENTS (Continued)
November 15, 16, and 17, 2005

Public Comments	Disposition of Comments
Prescott 75 Participants	
• A safe crossing of Williamson Valley Road for equestrians, pedestrians, and bicycles using the American Ranch Trail is needed just north of Blackjack Ridge Road	Provision of safe roadway crossings for equestrians, pedestrians, and bicyclists is included in the recommendations of the plan.
• If residential areas need to be expanded then full consideration should be given to providing berms, foliage, and sound walls	Comment referred to local jurisdictions for further disposition.
• We must provide for alternative modes of transportation (bicycles, walking, public mass transit)	Comment referred to local jurisdictions for further disposition.
• Make Highway 89 4-lane sooner	The consultant concurs that additional north-south lanes are needed in the study area.
• Widening Williamson Valley road to 5 lanes does not give priority to preserving the scenic route of the roadway	Comment referred to local jurisdictions for further disposition.
• Please look at all possible connectors between Williamson Valley Road and SR 89	A number of connecting alignments were evaluated in the traffic forecasting process.
• Consider future constraints due to water availability when projecting population growth	Comment referred to local jurisdictions for further disposition.

March 2006

The second series of public meetings was held in March 2006 to present the study alternatives and the preliminary regional system. Excluding the consultant team who conducted the sessions, a total of 70 persons attended the second set of four open house events. The Prescott sessions had the highest attendance—a combined total of 49 persons. The Chino Valley session had the lowest recorded attendance—4, due to the severe winter weather that evening. Nine comment forms were completed and returned during the sessions. Another half-dozen comments were received later by e-mail.

Tables 2 presents a summary of the public comments.

TABLE 2. SUMMARY OF PUBLIC COMMENTS
March 21, 22, and 30, 2006

Public Comment	Disposition of Comment
Chino Valley 4 Participants	
	No comments received due to light attendance
Prescott Valley 25 Participants	
• Need a concrete or steel barrier or median on SR 69	Comment referred to the Town of Prescott Valley for further disposition.
• Urge limited access with overpasses	Comment referred to the Town of Prescott Valley for further disposition.
• Alternatives presented in the plan do not relieve congestion in Prescott Valley	Plan is regional in scope and intended to enhance future mobility throughout the area.
• Transit for P.V. may make sense	Improvements to regional transit service are included in the plan recommendations.
• We do not need 14 lanes on Highway 69 or 10 lanes on Highway 89—that would turn Prescott into a smaller version of Los Angeles	The "additional lanes" were mentioned in the presentations to illustrate the magnitude of the forecasted unmet need.
Prescott 49 Participants	
• We cannot build 17 additional east-west lanes and 13 north-south lanes	The "additional lanes" were mentioned in the presentations to illustrate the magnitude of the forecasted unmet need.
• Adopt "Smart Growth" policies	Comment referred to the City of Prescott for further disposition.
• Future water supplies will not support population projections	In the "worst case scenario" projections used, water supply constraints were not considered.
• We must provide for alternative modes of transportation (bicycles, walking, public mass transit)	The consultant concurs; provisions for alternatives are included in recommendations.
• Consider future constraints due to water availability when projecting population growth	Comment referred to local jurisdictions for further disposition.
• Alternative mode usage projections of one percent are ridiculously low	One percent is a region-wide average including areas without alternatives. Usage in specific corridors can be higher.
• Regional land use planning and transportation planning must be coordinated	The consultant concurs. Included in recommendations.
• Area railroad grade could provide for a rail system that connects all four cities	The consultant concurs; comment referred to local jurisdictions for further disposition.
• CYMPO must do a land use plan in conjunction with transportation plan	The consultant concurs. Included in recommendations.

July and August 2006

Presentations of the proposed regional system were made in July and August 2006 to the individual jurisdiction Councils and to the Yavapai County Board of Supervisors. The public and agency comments were considered in the analysis and development of the proposed plan. Table 3 summarizes the jurisdictional comments.

TABLE 3. SUMMARY OF JURISDICTIONAL PRESENTATION COMMENTS

Jurisdiction		Comments
Yavapai County	**July 5, 2006**	
Presented the Draft Regional Transportation System to the Board of Supervisors		Supervisor Davis was concerned with the connection of this future roadway system to the remainder of Yavapai County and what steps need to be taken in order to work with ADOT to achieve better mobility in the County. Overall the Supervisors regarded the plan favorably.
City of Prescott	**July 25, 2006**	
Presented the Draft Regional Transportation System to the City Council		City council member expressed strong consensus for the incorporation of transit in the plan and development a regional land use plan. Additionally, gratitude was expressed for mentioning the large cost anticipated for the implementation of the system, since it is often under estimated
Town of Prescott Valley	**July 27, 2006**	
Presented the Draft Regional Transportation System to the Town Council		The town council members regarded the future roadway system favorably. Transit was a strong concern, but the final transit improvements were deferred to the results of currently ongoing Transit Feasibility Study
Town of Chino Valley	**August 3, 2006**	
Presented the Draft Regional Transportation System to the Town Council		After the presentation, questions arose regarding the integration of the regional roadways system with the Chino Valley transportation plan proposed in the Chino Valley SATS. Ron Grittman, the Town Engineer, and the SATS project manager responded to the inquiries.

2. EXISTING REGIONAL CHARACTERISTICS

EXISTING SOCIOECONOMIC CONDITIONS

This chapter discusses the socioeconomic conditions: population, dwelling units, and employment as well as the distribution of the data within the study area. Current and future population and employment data were provided by local jurisdictions, Yavapai County, and the Yavapai-Prescott Nation.

Population and Dwelling Units

Population estimates for the CYMPO region are shown in Table 4. Census 2000 population totals are shown for each jurisdiction. In addition, Table 4 includes 2000 population figures adjusted to reflect the Traffic Analysis Zone (TAZ) structure created for the study. These population numbers differ from the Census 2000 numbers as the TAZ's cover different geographic boundaries and may include additional population from county areas. The 2004 figures are estimates derived for this project using feedback from the jurisdictions on land use changes and growth and follow the same TAZ structure as the 2000 adjusted estimates. The increase in population has been calculated between the 2000 adjusted figures and 2004 local estimates, as these share TAZ boundaries.

The 2004 estimated population of the CYMPO region is 116,362. The majority of the population lives within one of the five incorporated municipalities, including the Yavapai-Prescott Nation. Overall, the region has grown by approximately sixteen percent since 2000, with Prescott Valley experiencing the largest percent change. However, the City of Prescott remains the largest jurisdiction in the area. Figure 2 shows population distribution by TAZ.

TABLE 4. POPULATION

Jurisdiction	Census 2000	Census 2000 (Adjusted to TAZ's)	Local Estimate 2004	Increase	Percent Growth
Chino Valley	7,835	8,407	10,254	1,847	21.9%
Prescott	33,938	38,051	44,732	6,681	17.5%
Prescott Valley	23,535	27,685	33,504	5,819	21.0%
Yavapai County (In CYMPO)	n/a	22,227	25,371	2,144	9.23%
Yavapai-Prescott Nation	182	182	200	18	9.9%
Dewey-Humboldt (Town)*	n/a	3,302	3,629	327	9.9%
Total	**65,490**	**99,854**	**117,672**	**16,836**	**16.9%**

Note: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.

* Dewey-Humboldt incorporated after the 2000 Census, the 2000 population is a best estimate based on TAZ data.

FIGURE 2. 2004 POPULATION DISTRIBUTION BY TAZ

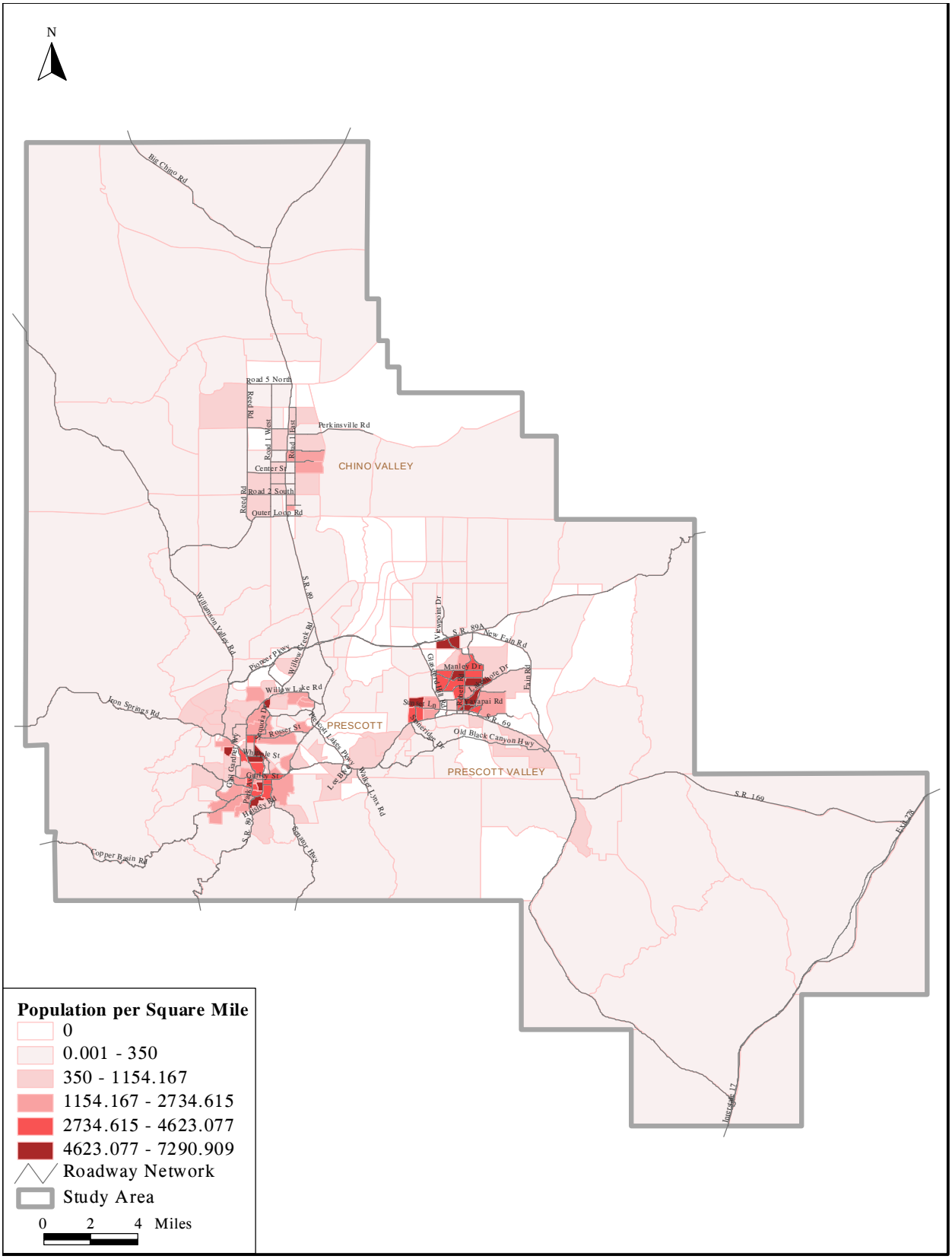


Table 5 provides estimates on the number of dwelling units within the CYMPO. The year 2000 numbers are adjusted Census 2000 data, based on the TAZ structure. The 2004 estimates were updated using feedback from local jurisdictions on land use changes and growth. The table shows the increase between 2000 and 2004, as well as the percent growth.

TABLE 5. DWELLING UNITS

Jurisdiction	Census 2000 (Adjusted to TAZ's)	Local Estimates 2004	Increase	% Growth
Chino Valley	3,472	3,889	417	12.0%
Prescott	19,433	21,833	2,400	12.4%
Prescott Valley	11,358	14,020	2,662	23.4%
Yavapai County (In CYMPO)	11,257	12,600	1,343	11.9%
Yavapai-Prescott Nation	59	66	7	11.9%
Dewey-Humboldt (Town)	1,464	1,805	341	23.3%
Total	**47,043**	**54,213**	**7,170**	**15.2%**

NOTE: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.
* Dewey-Humboldt incorporated after the 2000 Census, the 2000 figures are based on TAZ data.

The overall average growth in dwelling units for the area was fifteen, consistent with population growth. Prescott Valley experienced a large amount of growth in dwelling units, while Dewey-Humboldt followed closely with the second largest percent growth. Prescott and Prescott Valley added nearly the same number of dwelling units between 2000 and 2004. Table 6 shows the number of occupied dwelling units compared to overall dwelling units for the CYMPO region, which provides perspective on vacancy rates in the region. The overall average vacancy rate is estimated at twelve percent. The highest vacancy rates are in Dewey-Humboldt, Yavapai-Prescott Nation, and unincorporated Yavapai County, and the lowest in Chino Valley.

TABLE 6. OCCUPIED DWELLING UNITS

Jurisdiction	2004 Local Estimates of DU's	2004 Local Estimates of Occupied DU's	Difference	Vacancy Rate
Chino Valley	3,889	3,820	448	1.8%
Prescott	21,833	20,021	1,812	8.3%
Prescott Valley	14,020	12,881	1,139	8.1%
Yavapai County (In CYMPO)	12,600	10,365	2,235	17.7%
Yavapai-Prescott Nation	66	54	12	18.2%
Dewey-Humboldt (Town)	1,805	1,312	491	27.3%
Total	**54,213**	**48,453**	**6,373**	**11.8%**

Employment

The 2004 employment estimates for the CYMPO region are presented in Table 7, and are based on updated census figures with information from local jurisdictions. The total employment for the region is estimated at 35,848. Prescott has the largest employee base while the community of Dewey-Humboldt has the smallest. Employment figures are based on three categories: retail, office, and industrial. Each category represents a different trip generation rate. The employment distribution by TAZ is shown in Figure 3.

TABLE 7. EMPLOYMENT

Jurisdiction	2004 Local Estimate of Total Employment
Chino Valley	2,285
Prescott	19,038
Prescott Valley	8,977
Yavapai County	3,776
Yavapai-Prescott Nation	1,729
Dewey-Humboldt-CDP	43
Total	**35,848**

Traffic Analysis Zones

Socioeconomic data, including population, dwelling units, and employment, was distributed based on TAZs. Traffic analysis zones are used to divide large regions, like the CYMPO, into smaller geographic elements to group socioeconomic data for traffic modeling purposes. TAZ boundaries are based on major streets, physical boundaries like major waterways, and political boundaries. Figure 4 shows the TAZ structure for the CYMPO, which divides the area into 307 zones. Detailed socioeconomic data by TAZ is presented in the model documentation.

Title VI – Environmental Justice Overview

Title VI of the Federal Civil Rights Act specifically refers to discrimination on the basis of race, color, national origin, and income. Proposed transportation improvements and projects that use public monies are required to include a review of socioeconomic conditions near and surrounding the project. Affected populations covered in this review include: persons aged 65 and over, minorities, people living below the poverty level, mobility limited persons and households without access to a vehicle. All socioeconomic data is from the Census 2000 database.

FIGURE 3. 2004 EMPLOYMENT DISTRIBUTION BY TAZ

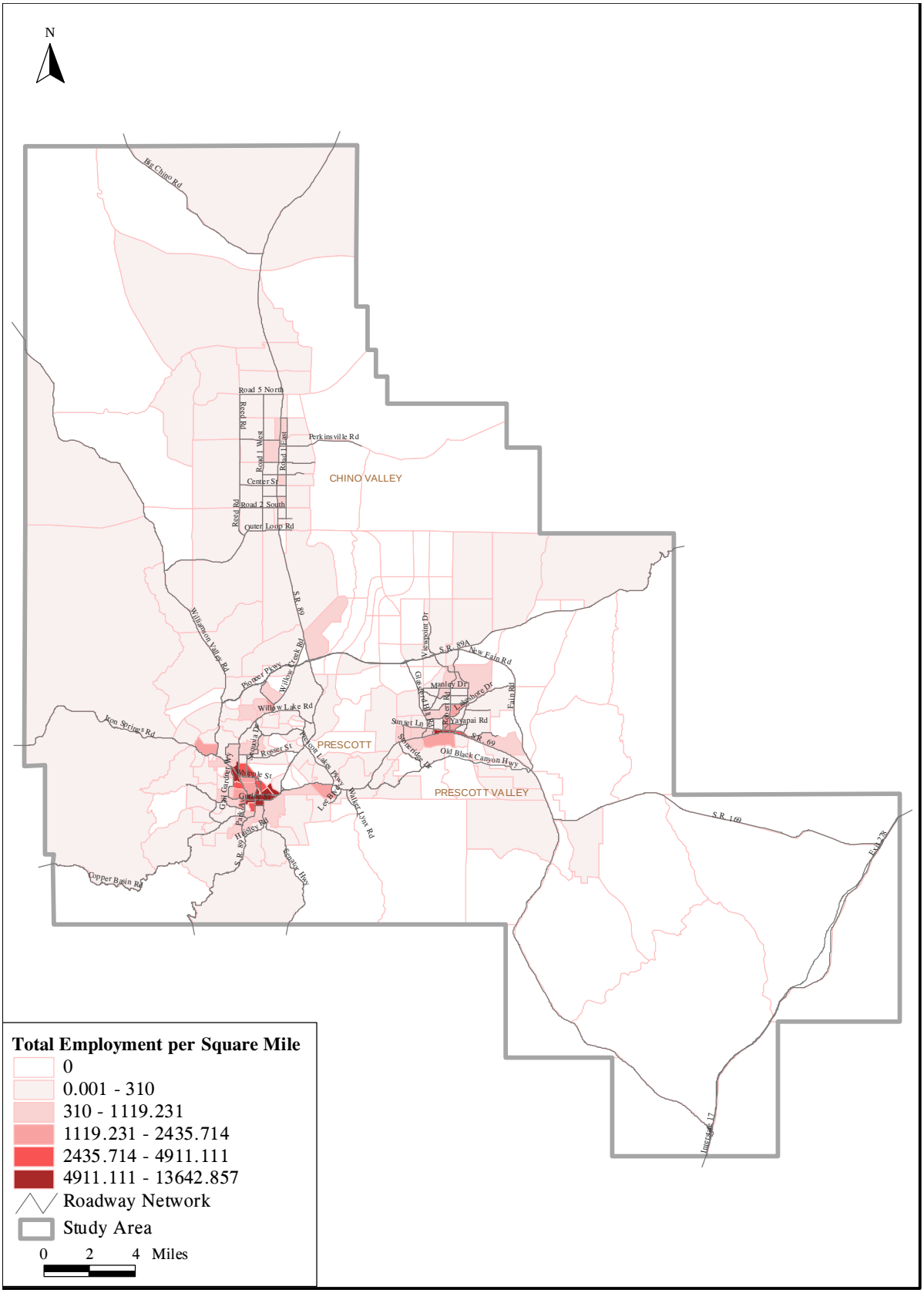
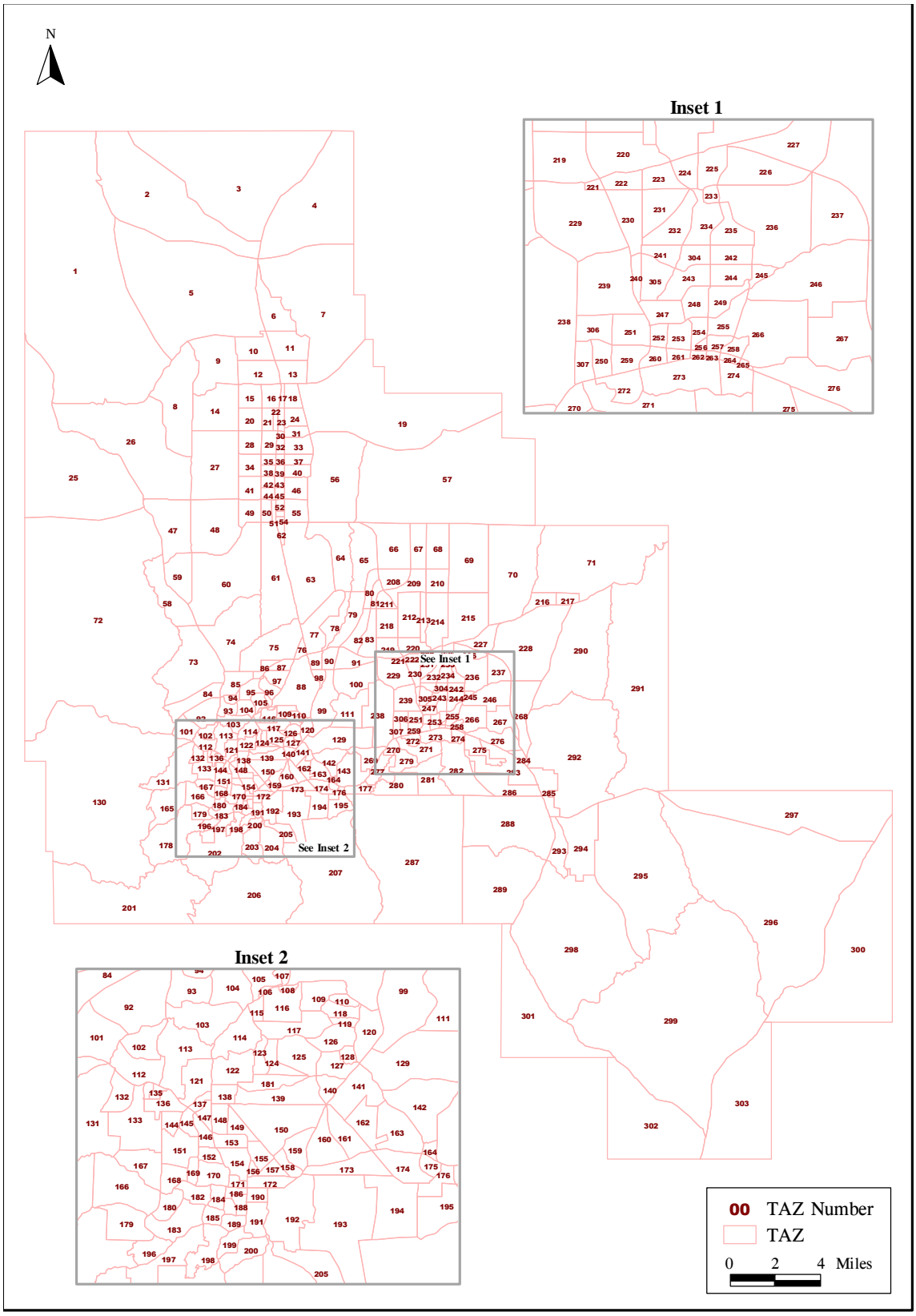


FIGURE 4. TRAFFIC ANALYSIS ZONES



Summary of Findings

The CYMPO region has a slightly higher percentage of person aged 65 and over than the rest of Arizona. The percentage of minorities in the CYMPO region is lower than Arizona overall, except in the Yavapai-Prescott Nation. The CYMPO region has a slightly lower percent of the population living below the poverty level than does Arizona as a whole. Generally the CYMPO region has higher percentages of mobility-limited persons than Arizona as a whole, and lower percentages of households without access to a vehicle. Concentrations of these affected populations are clustered mostly in Prescott and Prescott Valley, the two largest communities in the CYMPO area. Proposed roadway improvements in or near these two communities will need to be sensitive to possible concentrations of affected populations, and reviewed on a project by project basis. Table 8 shows the percentages of the total study area population that meet the Title VI criteria. A series of GIS maps follow that depict the distribution of the affected populations.

TABLE 8. SUMMARY OF CYMPO REGION TITLE VI DATA

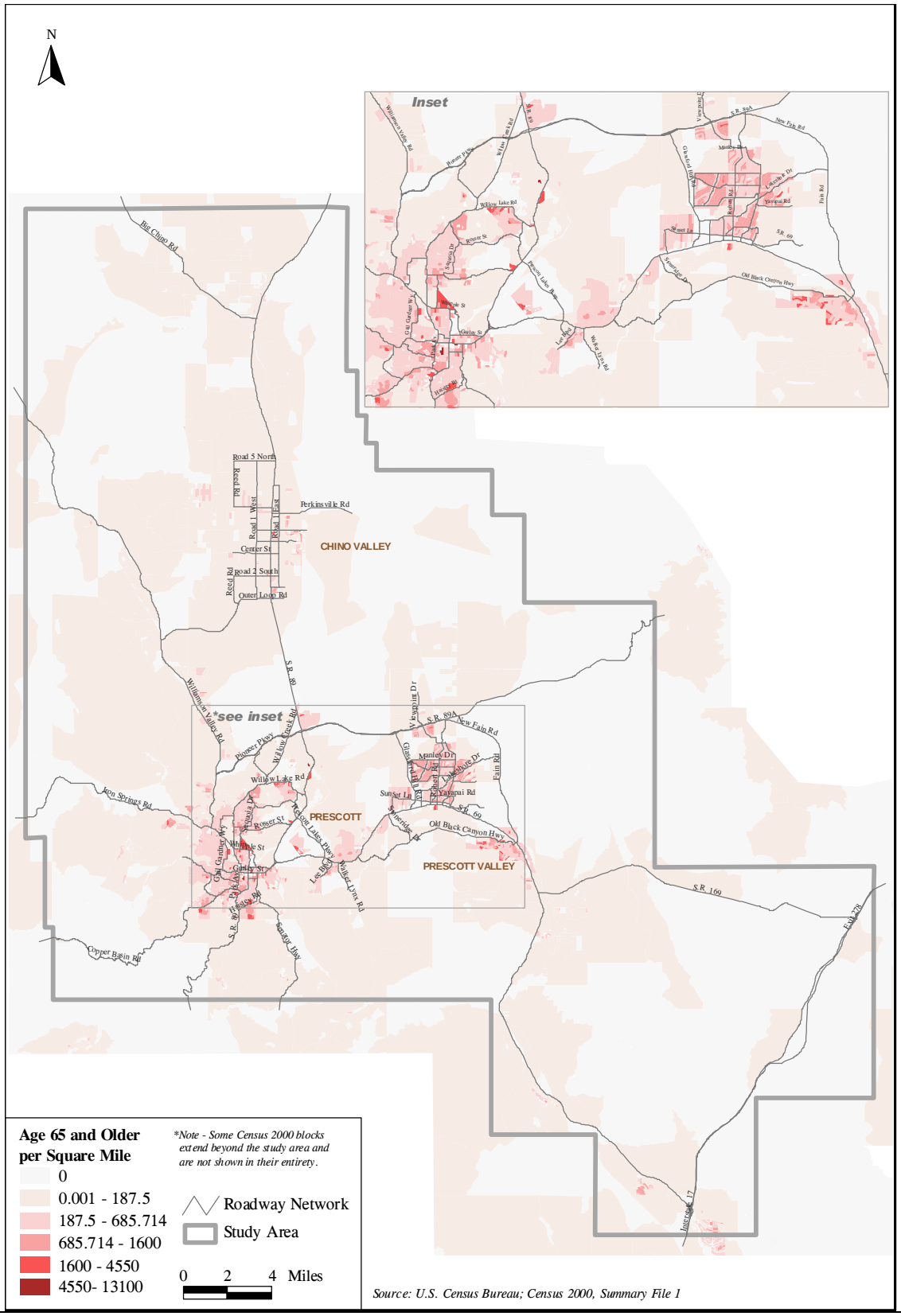
	Total Population	Percentage Age 65+	Percent Minorities	Percent Population With Income Below Poverty	Percent Aged 16 – 64 With Disability	Percent Households Without Access to Automobiles
Arizona (Census 2000)	5,130,632	13.0%	36.2%	13.9%	19.9%	7.4%
Yavapai County (Census 2000)	167,517	21.9%	8.1%	11.9%	21.3%	4.8%
CYMPO Study Area (2004 Local Estimate)	116,829					
Local Communities						
Prescott (Census 2000)	33,938	26.8%	7.1%	13.0%	17.7%	6.6%
Prescott Valley (Census 2000)	23,535	17.2%	8.9%	10.9%	22.0%	4.0%
Chino Valley (Census 2000)	7,835	16.2%	5.9%	15.5%	22.2%	4.7%
Dewey-Humboldt CDP* (Census 2000)	6,295	31.4%	3.6%	8.7%	24.6%	3.7%
Yavapai-Prescott Nation (Census 2000)	182	7.1%	85.7%	6.6%	40.7%	0.0%

Source: Census 2000, CYMPO Study Area 2004 population based on local estimates.
* Dewey-Humboldt was considered a Census-Designated Place (CDP) for the 2000 Census.

Persons Aged 65 and Over Population

As Table 8 shows, Dewey-Humboldt and the City of Prescott have the highest percentages of persons aged 65 and over. Figure 5 depicts the distribution of persons aged 65 and over per square mile within the CYMPO study area.

FIGURE 5. AGE 65 AND OLDER POPULATION PER SQUARE MILE (BY CENSUS BLOCK)



Minority Population

Table 8 shows that the Yavapai-Prescott Nation has the highest percentage of minority population followed by Prescott Valley. Not including the Yavapai-Prescott Nation, the rest of the CYMPO region generally has a lower percentage of minorities than Arizona. Figure 6 show distribution of minority population per square mile within the study area. Concentrations of minority populations can be seen in small areas of Prescott and Prescott Valley.

Low Income Persons

Table 8 also shows the percentage of population within the CYMPO living below the poverty level as compared to Arizona and Yavapai County. Chino Valley has the highest percentage of population living below the poverty level, followed by the City of Prescott. The CYMPO area appears to have a slightly lower percentage of population living below the poverty level as compared to overall Arizona percentages. Concentrations of low income persons are shown by census block group in Figure 7.

Mobility-Limited Populations

Mobility-limited populations are those person aged 16 - 64 with disabilities as defined by Census 2000. Table 8 provides the percentages of mobility limited populations within the CYMPO area as compared to Arizona and Yavapai County. The Yavapai-Prescott Nation has the highest percentage of mobility-limited persons, followed by Dewey-Humboldt. In general, the percentage mobility-limited persons is slightly higher than Arizona, but in line with overall Yavapai County percentages. Figure 8 depict the concentrations of mobility-limited persons within the CYMPO study area.

Households Without Access to a Vehicle

Table 8 provides the percentages of households in the CYMPO area without access to a vehicle, as compared to Arizona and Yavapai County totals. The City of Prescott has the highest percentage of households without access to a vehicle. In general, however, the overall percentages in the CYMPO are lower than the overall Arizona percentages, and in line with those of Yavapai County as a whole.

Figure 9 depicts distribution of households without access to a vehicle per square mile as based on Census 2000 Block Group level data. Consistent with Table 8, higher concentrations can be seen in the southern portions of the City of Prescott.

FIGURE 6. MINORITY POPULATION PER SQUARE MILE (BY CENSUS BLOCK)

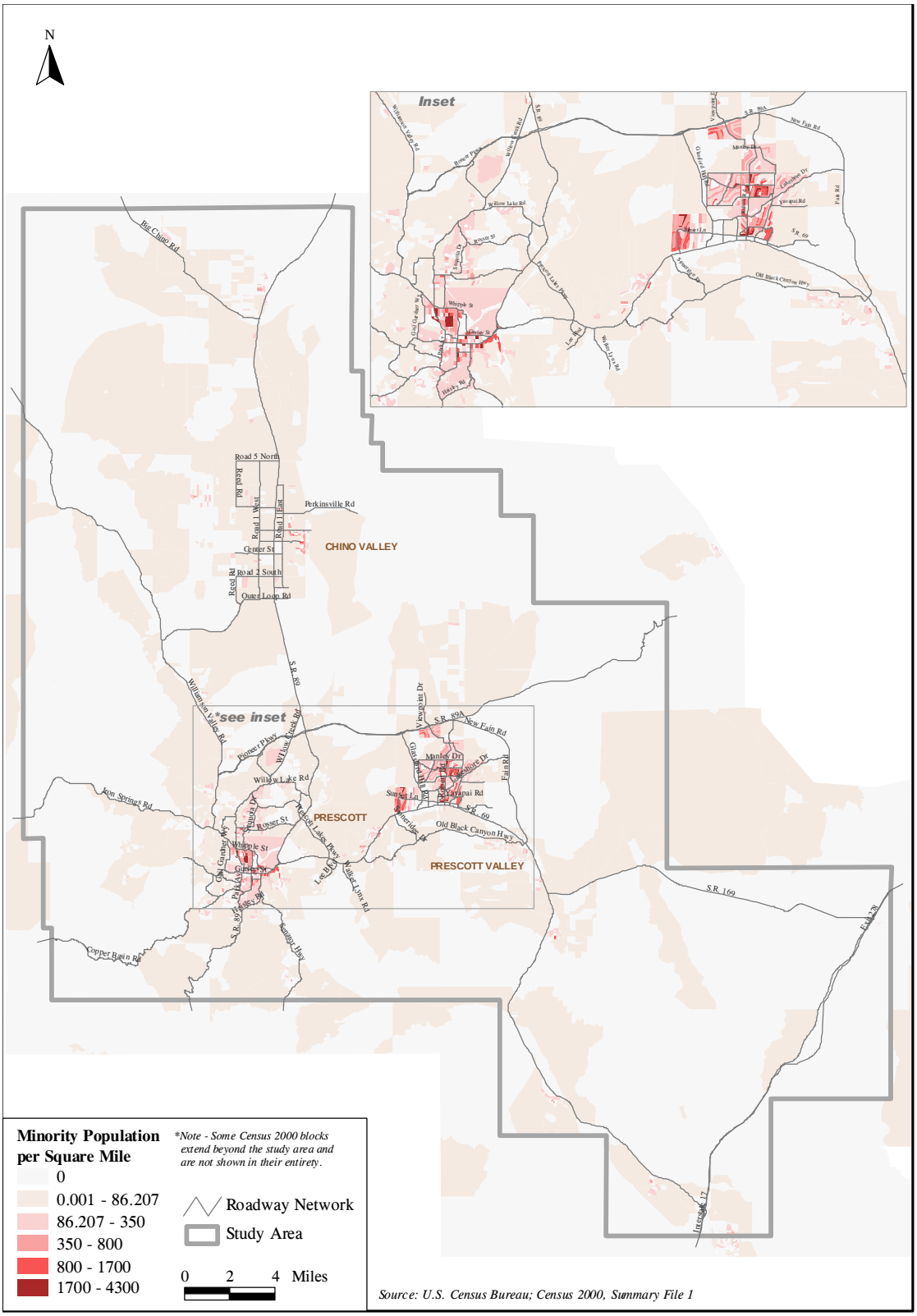


FIGURE 7. POPULATION BELOW POVERTY LEVEL PER SQUARE MILE (BY CENSUS BLOCK GROUP)

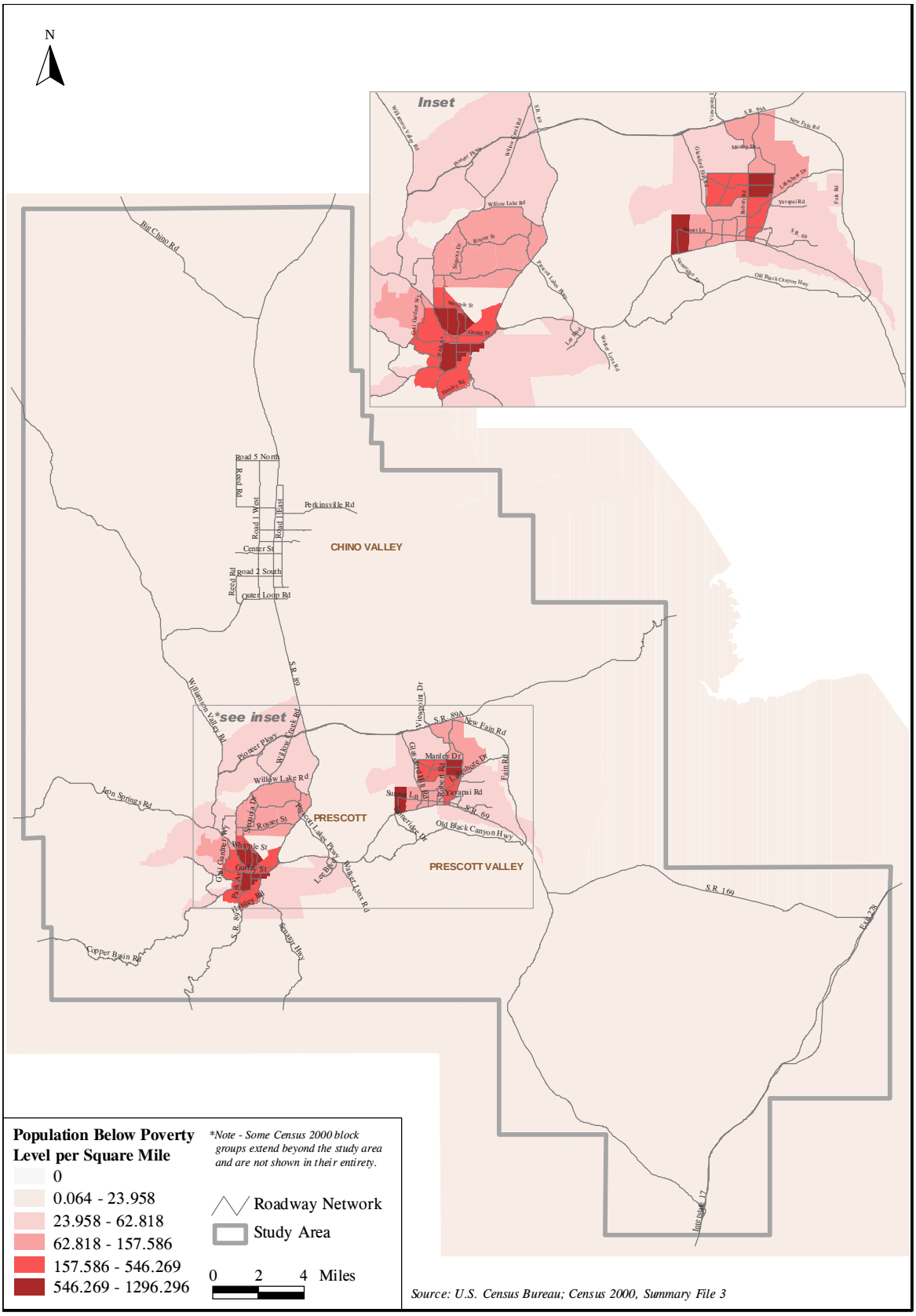


FIGURE 8. MOBILITY-LIMITED POPULATION PER SQUARE MILE (BY CENSUS BLOCK GROUP)

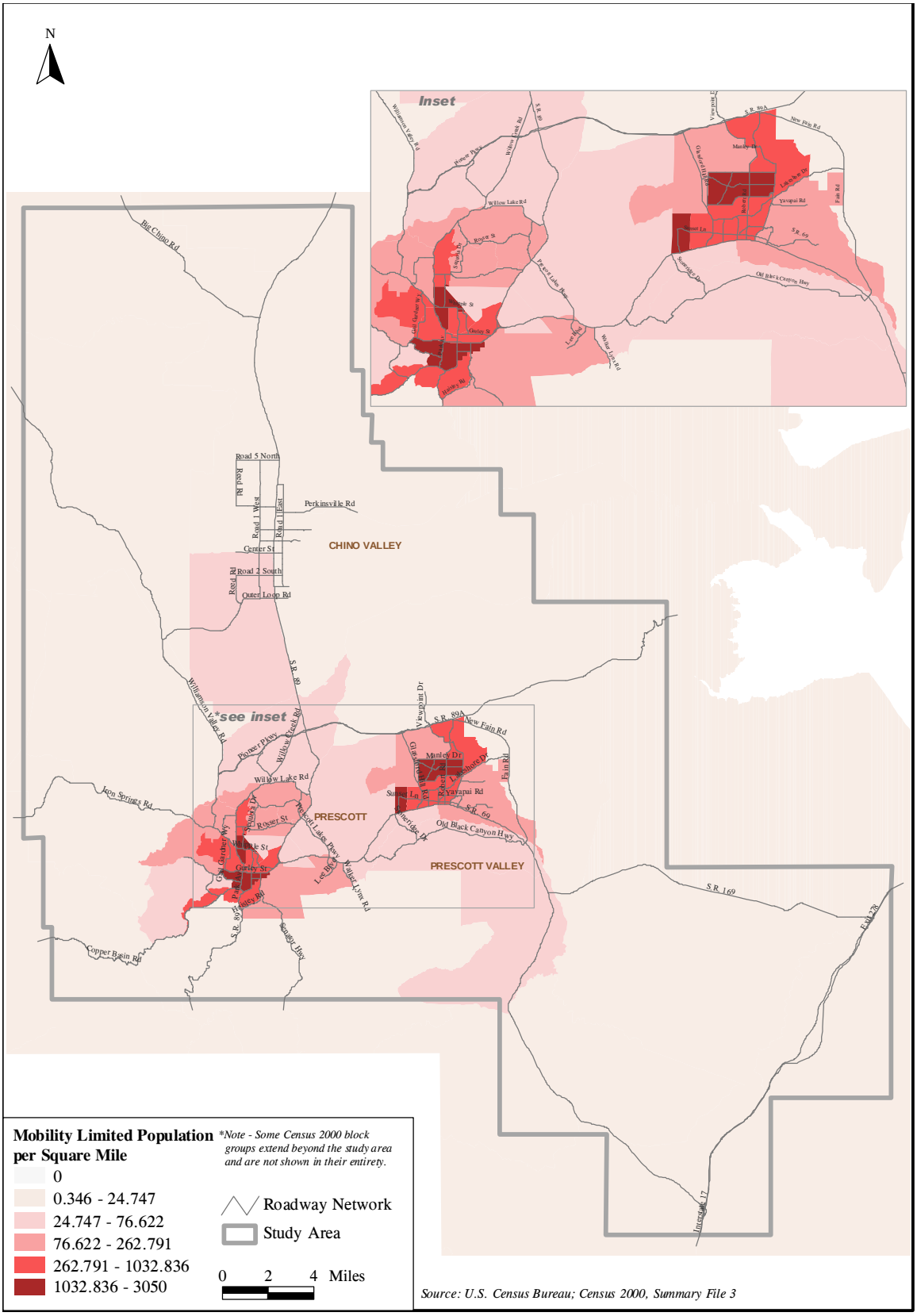
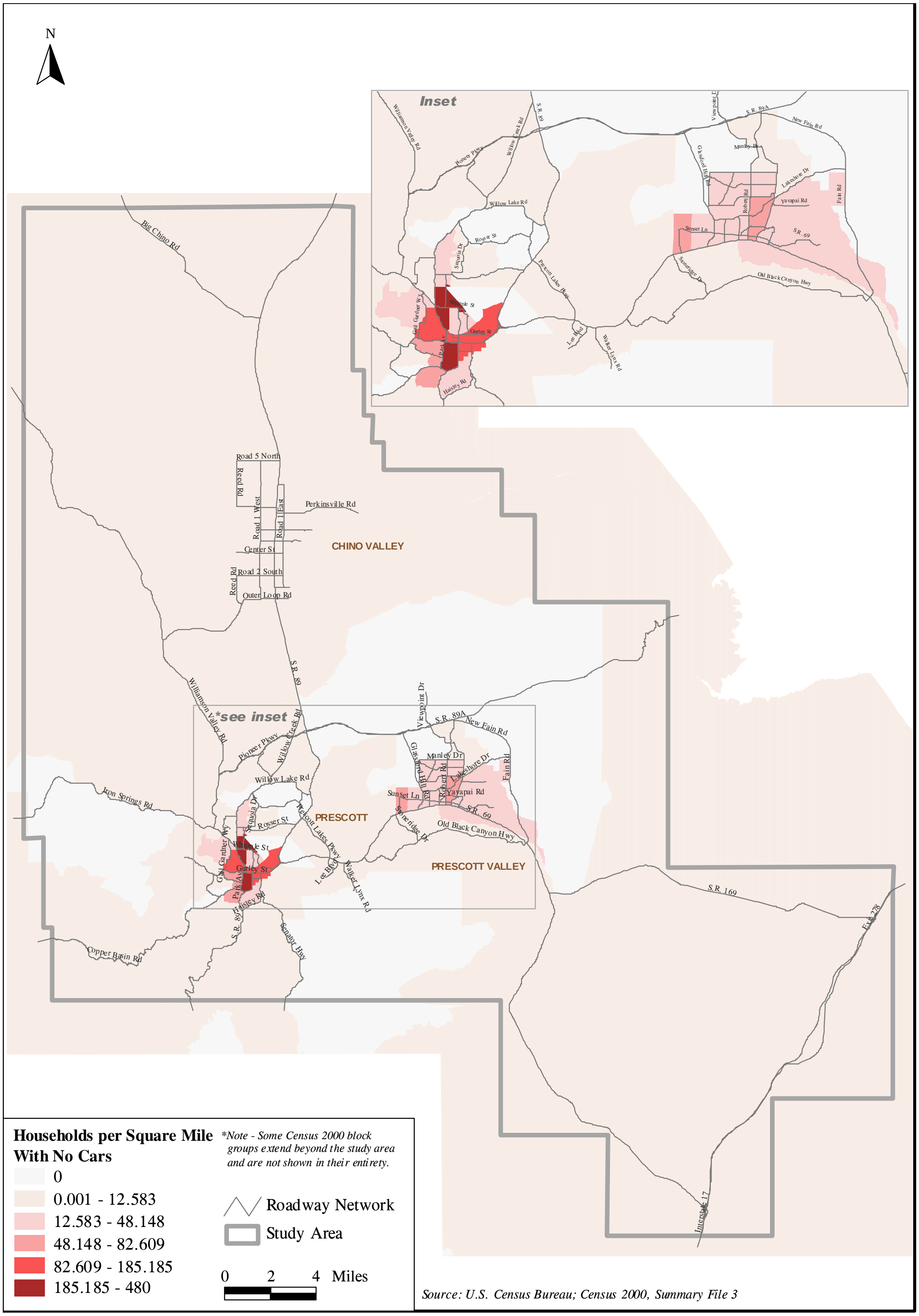


FIGURE 9. HOUSEHOLDS WITHOUT VEHICLES (BY CENSUS BLOCK GROUP)



Regional Activity Centers

Figures 10 and 11 show activity centers throughout the CYMPO region. This includes land uses such as the airport, major shopping centers, schools and parks. These activity locations attract and generate traffic, which is important to recognize when developing future transportation improvements.

FIGURE 10. CYMPO ACTIVITY CENTERS

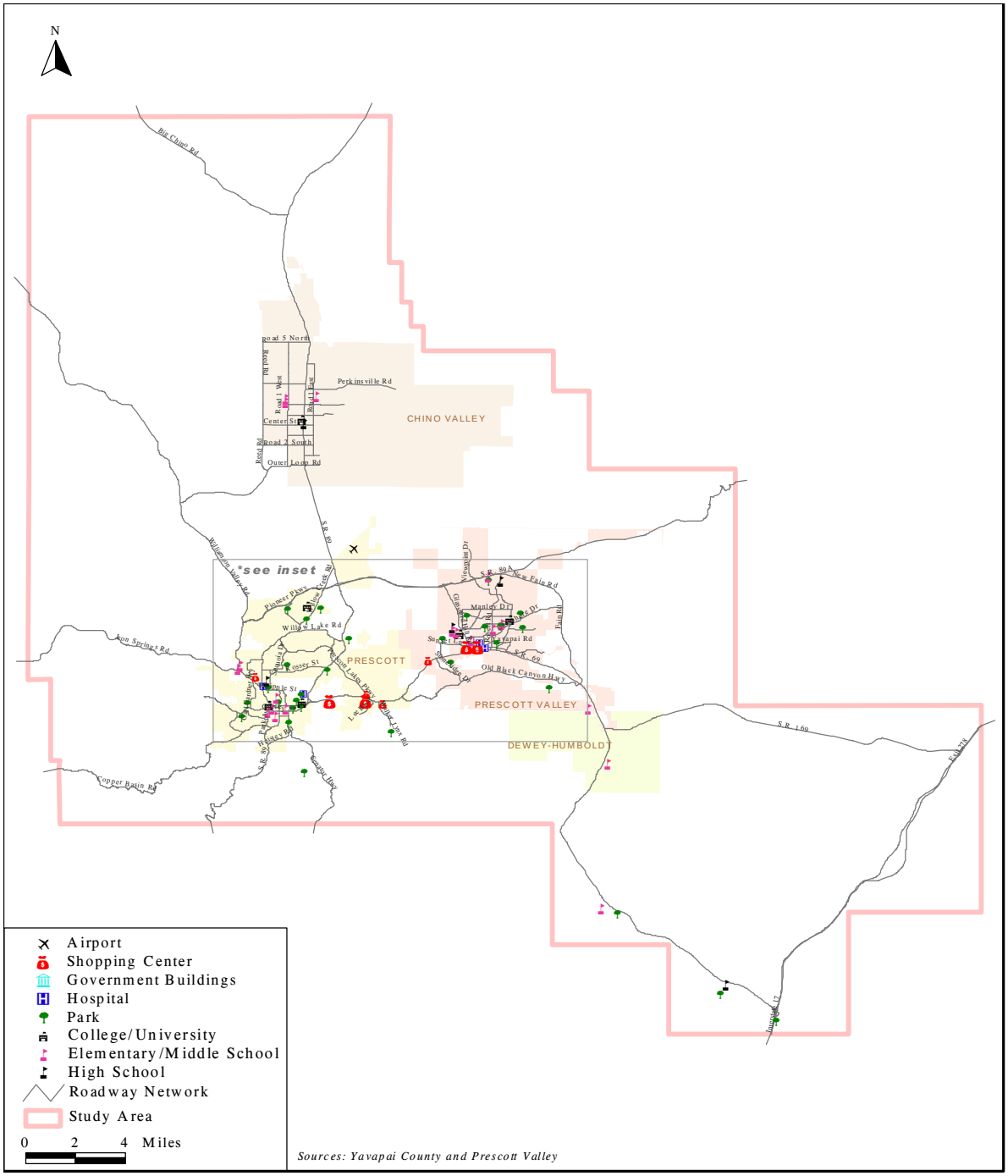
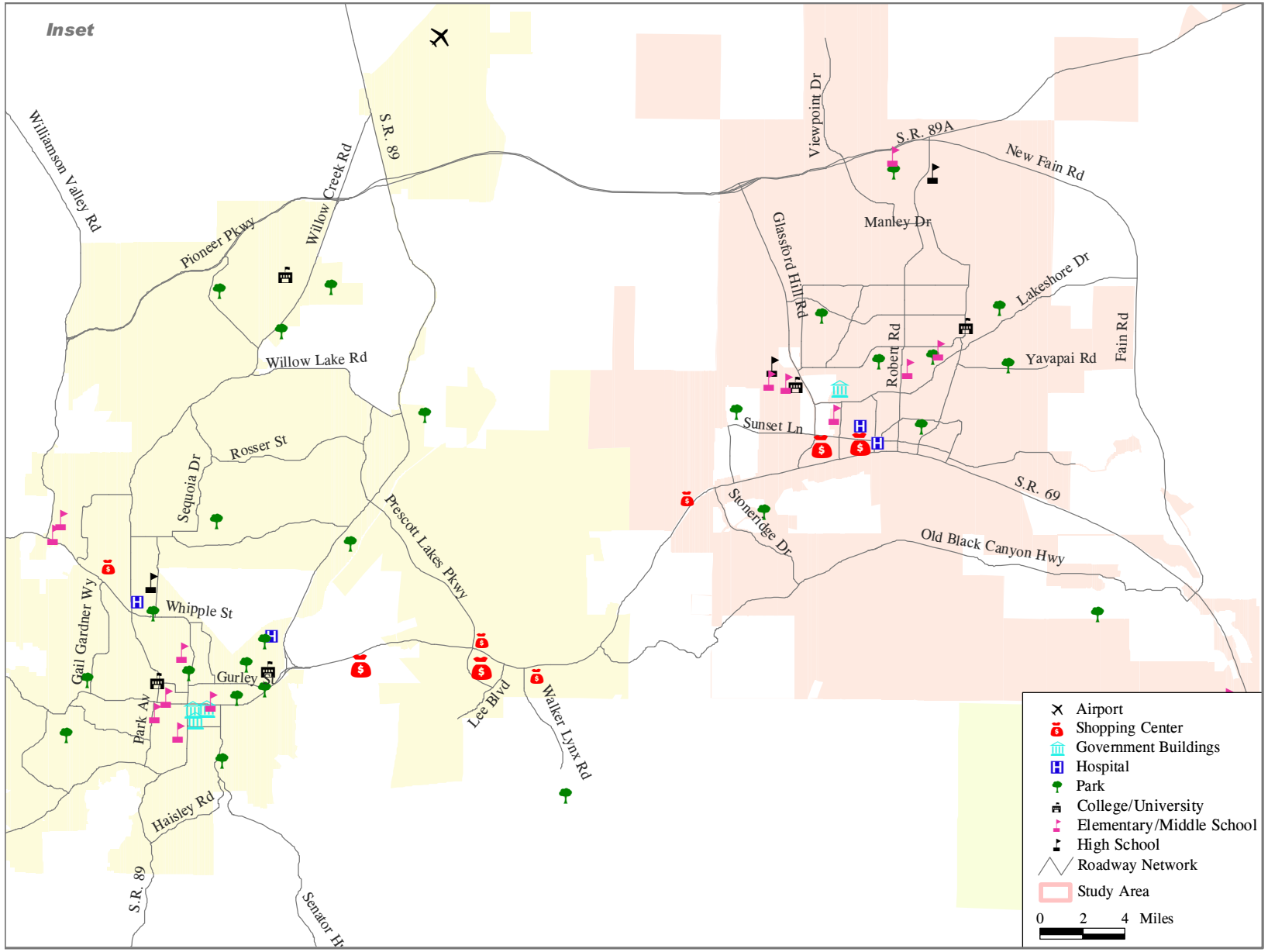


FIGURE 11. CYMPO ACTIVITY CENTERS (INSET)



The major shopping centers are located along SR 69 with the Pioneer Village and the Prescott Gateway Mall in Prescott and the Town & Country Valley Center and Prescott Valley Entertainment Center in Prescott Valley. Other major activities centers are the VA Medical Center, Yavapai Regional Medical Center, Yavapai County Court House, Yavapai Community College and the Embry-Riddle Aeronautical University. The primary and secondary schools displayed in Figure 11 do not include smaller private schools, which are abundant in the Prescott area. Ernest A. Love Field and Prescott municipal airport serves the commercial as well as the private needs of the entire metropolitan area.

EXISTING ROADWAY SYSTEM

The existing street system serving the CYMPO area consists of a set of regional roadways connecting communities together and local roadways serving each jurisdiction. Regional roadways include I-17 and State Routes 69, 89, 169, and 89A. These regional routes connect the CYMPO to the rest of Arizona and serve as main thoroughfares for each jurisdiction. State Route 69 travels southeast of the main population centers connecting to I-17 and serves as a primary route for travel between the CYMPO and the Phoenix region. State Route 89 heads north from Prescott, through Chino Valley, ultimately connecting with I-40 further north. State Route 169 provides another connection east to I-17 for those traveling to Flagstaff and other parts of north eastern Arizona. State Route 89A travels east with connections to the Sedona region and another route to the Flagstaff area. State Route 69 also serves Prescott Valley and Prescott as one of their main roadways with substantial commercial development located along the roadway. State Route 89 serves the same function for Chino Valley as it travels north through that community.

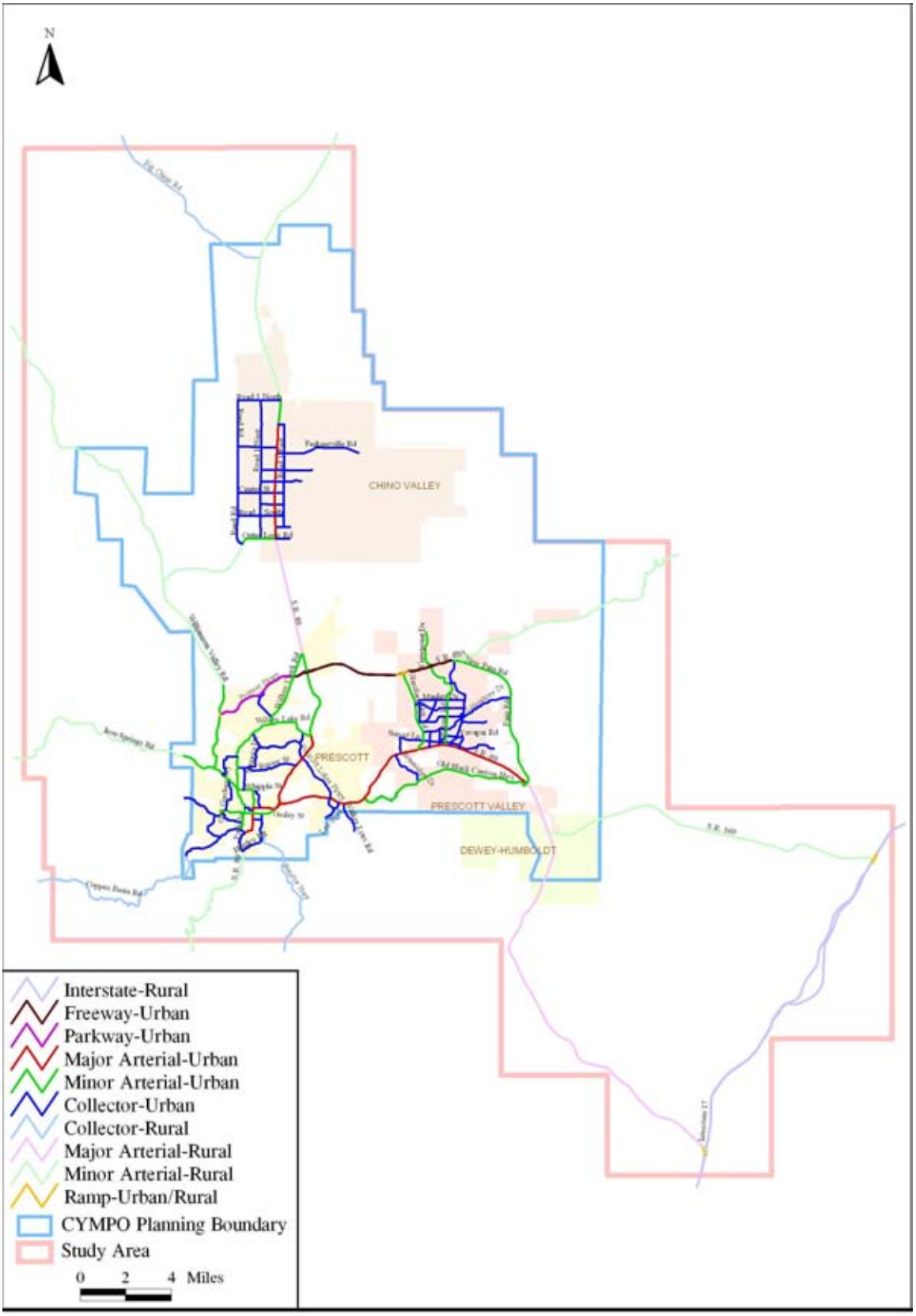
Important characteristics inventoried for the existing street system include the functional classification, number of lanes, and speed limits.

Functional Classification

The functional classification of a road network identifies roads with similar design and traffic characteristics. Roads are categorized by the function they perform in regard to providing access and mobility. A major arterial, for example, provides mobility between long distances with minimal access to adjoining properties. A collector, on the other hand, provides access to adjacent properties rather than serving long distances. Two area types are identified in the study area: urban and rural. Roadway functional classifications were developed to reflect these two area types.

The approved ADOT functional classification system was used as a base and modified to reflect more accurate functionality on particular roads for modeling purposes. For example, Fain Road is classified as a Rural Major Collector on the approved ADOT functional class map; however, for the model, Fain Road was coded as a Minor Arterial, which more closely reflects how Fain Road operates. Figure 12 shows the classification system used for the model.

FIGURE 12. FUNCTIONAL CLASSIFICATION



Within the CYMPO area, I-17 is the only interstate coded in the model. Interstates have very limited access, carry the largest volume of traffic, and function mainly as a facilitator of through movements bypassing the CYMPO. Major Arterials serve centers of activity and carry the second largest traffic volume within an area. Major Arterials carry the major portion of trips entering and leaving the area, as well as the majority of through movements bypassing central areas. Major arterials usually have fully or partially controlled access. In the CYMPO, SR 69 through Prescott Valley, and SR 89 in Prescott and Chino Valley are classified as Major Arterials.

Minor arterials connect with the major arterials and provide service trips of moderate length and distribute vehicles to collectors. Streets classified as Minor Urban Arterials in the CYMPO include:

- Old Black Canyon Highway
- Fain Road
- Willow Lake Road
- Glassford Hill Road
- Robert Road
- Gurley Street
- Whipple Street
- Williamson Valley Road
- Willow Creek Road
- State Route 89 (between Willow Lake and Willow Creek Road)

Collector streets provide traffic circulation within residential neighborhoods and low density areas, and direct access to adjacent properties. The collector system also distributes trips from the arterials to the local streets. Examples of urban collectors include Lakeshore Drive in Prescott Valley, Rosser Street in Prescott, and Center Street in Chino Valley.

Number of Lanes

The majority of the streets in the study area are two-lane facilities as shown in Figure 13. Four lane facilities include SR 69, portions of SR 89 and 89A, I-17, and a handful of streets in Prescott Valley and Prescott.

Speed Limits

The posted speed limits are shown on Figure 14. Speed limits generally range between 25 and 45 mph on incorporated municipality streets. I-17 is posted at 75 mph. Many of the arterials, such as State Routes 69, 169, and 89A are posted at 55 mph.

Traffic Counts

Existing traffic counts are shown on Figure 15. Counts are included for segments of the major roadway network. These counts provide an understanding of which roadways within the region are most heavily traveled. Roadways such as SR 89 and SR 69 have some of the higher traffic volumes in the region. Around 20,000 cars per day travel on SR 89 between Chino Valley and Prescott and upwards of 49,000 cars per day on sections of SR 69 between Prescott and Prescott Valley.

FIGURE 13. NUMBER OF LANES

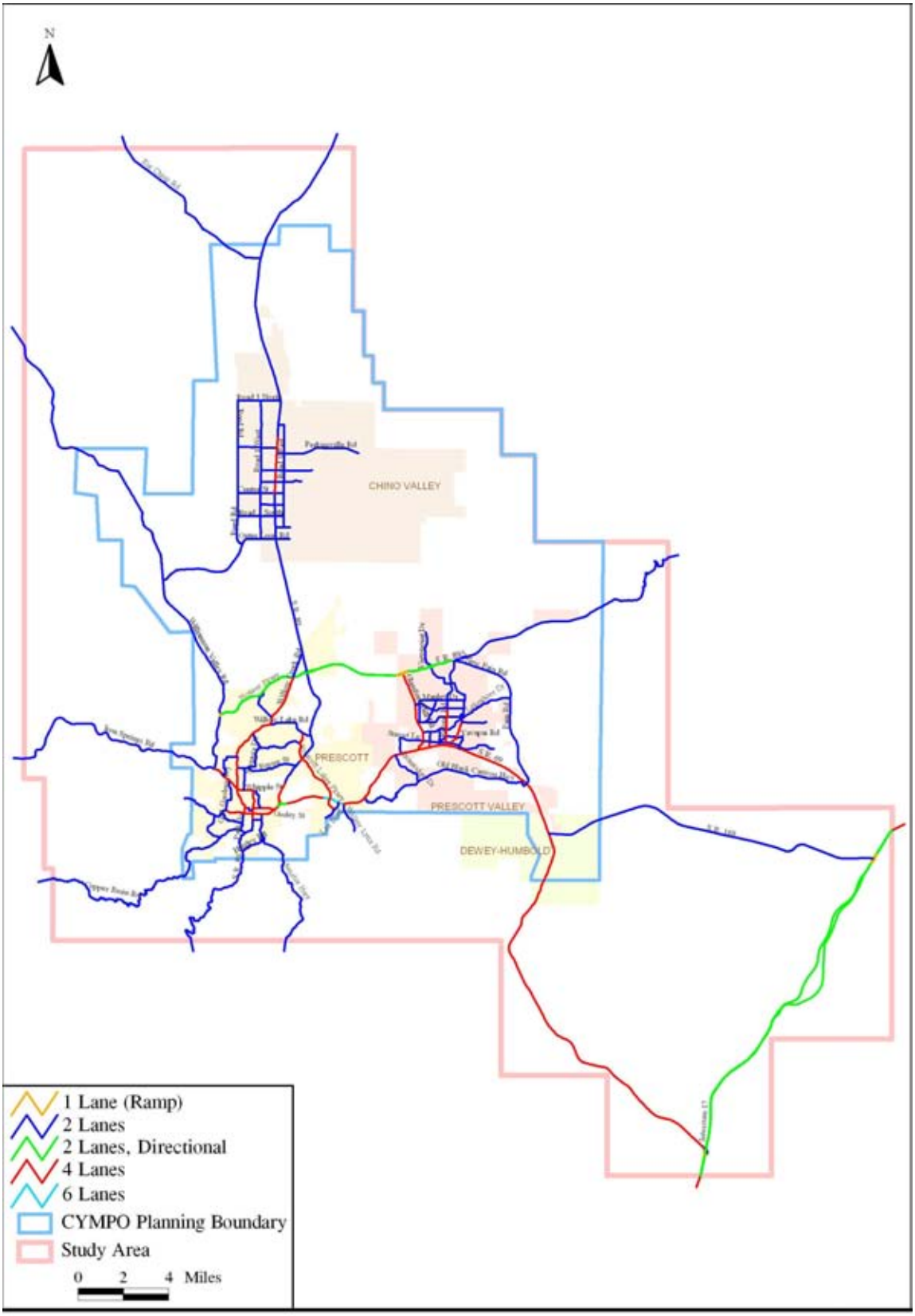


FIGURE 14. SPEED LIMITS

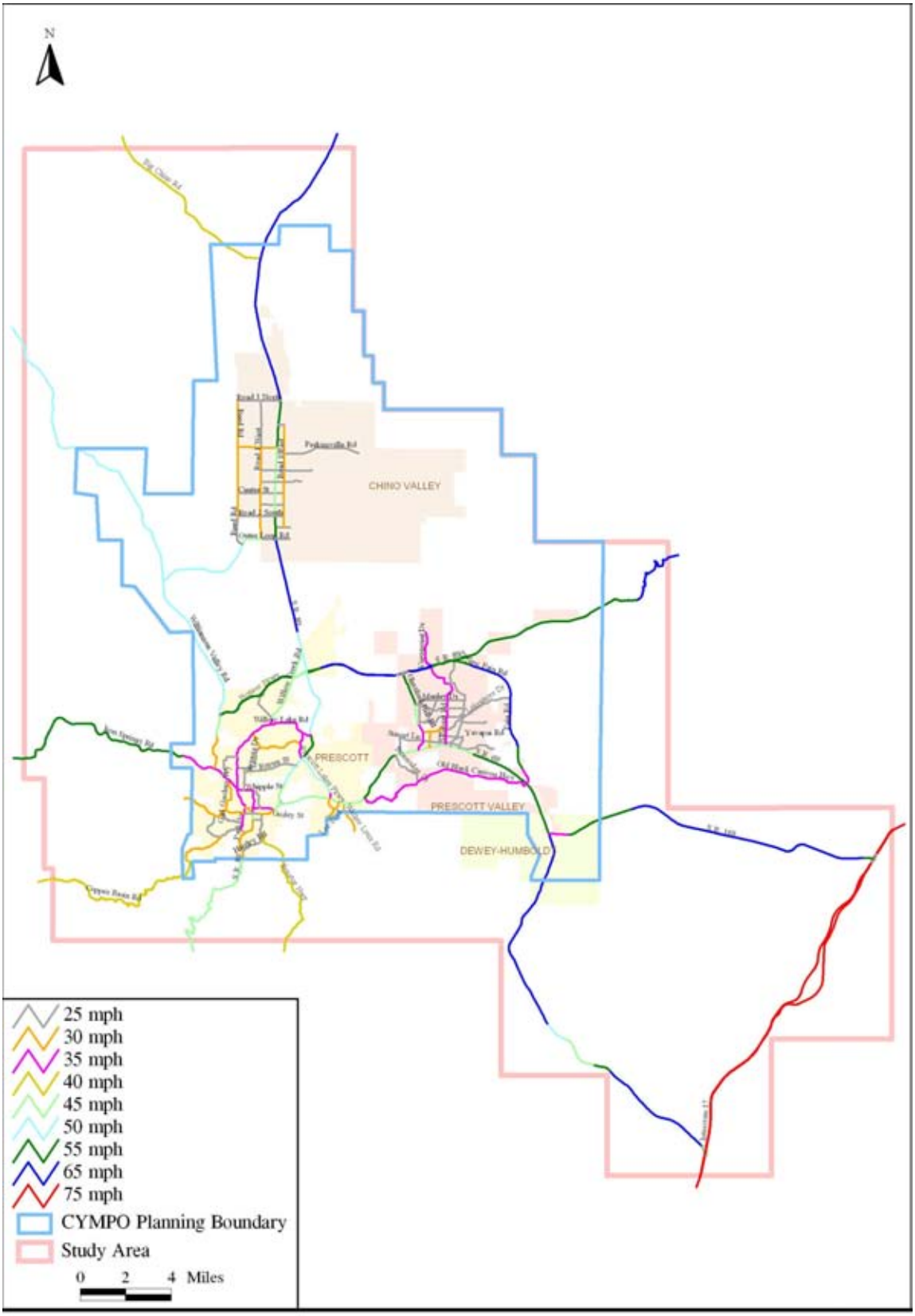
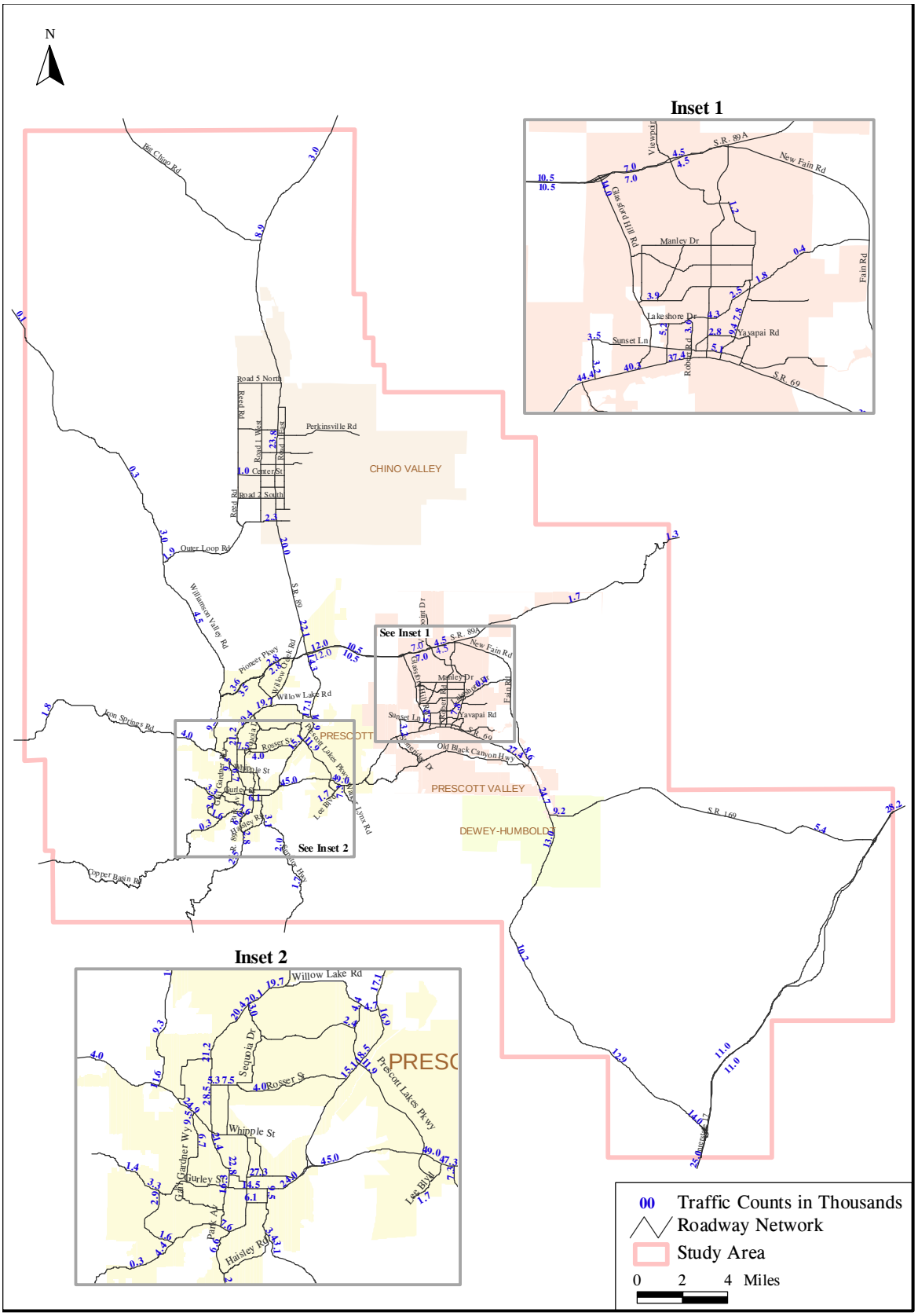


FIGURE 15. EXISTING TRAFFIC COUNTS



EXISTING TRAFFIC CONDITIONS

This section presents an assessment of existing traffic conditions in CYMPO study area. Existing conditions on the street network were assessed by reviewing the average daily traffic volumes as well as the roadway level-of-service (LOS).

Roadway Level of Service

Level-of-service is the average through-vehicle travel speed over the length of a given roadway segment. Levels of service range from LOS A to LOS F where LOS A represents free flow and LOS F represents forced traffic flow. For traffic modeling purposes, unsatisfactory capacity of a roadway segment is typically defined as the ADT that results in a LOS E, which is characterized by long delays and travel speeds that are one-third of the speeds at LOS A. Figure 16 presents a visual representation of LOS by travel mode in an urban environment.

A factor that affects traffic flow and ultimately LOS is a roadway's directional or per lane capacity. This capacity is a designation of how much traffic a roadway segment can carry, and is usually based on the road's functional classification as defined by U.S. Department of Transportation. For this study, Table 9 summarizes the daily roadway lane capacity by functional classification.

The volume-capacity (v/c) ratio was used to designate the network's current LOS operation. The directional capacities shown in Table 9 and the model forecasted traffic volumes were used to determine the v/c ratio as shown in Table 10. The present LOS operation for each link and the corresponding model traffic volumes are displayed in Figures 17 thru 20. Roadways with unsatisfactory levels of service, LOS E and F, are highlighted by orange and red lines. These unsatisfactory LOS levels are generally associated with the high traffic volume roads, such as SR 69 and 89. These v/c values will be compared with v/c ratios resulting from the alternative street networks modeled later in the study and used to determine the effectiveness of each alternative.

Traffic Volumes

Traffic counts, volumes, and LOS are shown in Figures 17 thru 20 at the end of this chapter. Figure 17 shows the entire CYMPO study area with LOS, counts, and volumes displayed on major streets. Figure 18, 19, and 20 are detailed views showing LOS, counts, and volumes for Prescott, Prescott Valley, and Chino Valley, respectively. Traffic counts reflect actual counts where available, whereas traffic volume numbers represent output volumes from the transportation model. One location with higher traffic counts and volumes for the region can be found on SR 69 from the 169 split into Prescott and on SR 89 heading north out of Prescott toward Chino Valley as shown on Figure 17.

FIGURE 16. EXAMPLES OF LEVEL-OF-SERVICE BY TRAVEL MODES FOR URBAN ARTERIAL

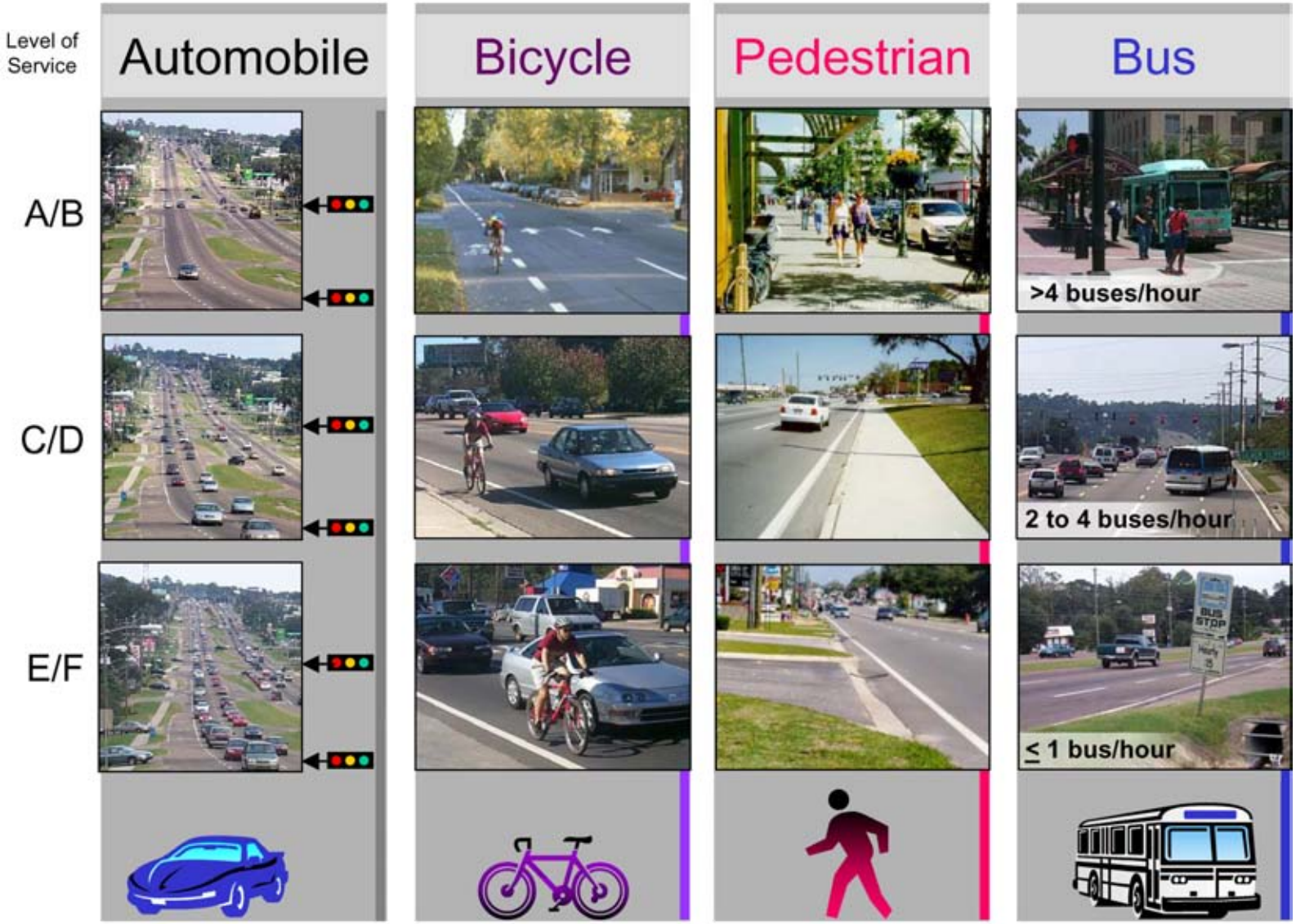


TABLE 9. DAILY ROADWAY CAPACITIES

Functional Classification	Daily Directional Capacity
Urban Freeway	19,200
Urban Ramps	18,000
Urban Parkway	12,000
Urban Major Arterial	10,000
Urban Minor Arterial	7,800
Urban Collector	5,300
Rural Interstate	18,500
Rural Ramps	13,700
Rural Major Arterial	7,800
Rural Minor Arterial	6,500
Rural Collector	3,700

TABLE 10. VOLUME CAPACITY RATIOS

Designation	V/C Ratio
Under Capacity (LOS A-C)	< .75
Near Capacity (LOS D)	.76 < .9
At Capacity (LOS E)	.91 < 1
Over Capacity (LOS F)	> 1

FIGURE 17. CYMPO 2004 TRAFFIC VOLUMES, TRAFFIC COUNTS AND LEVEL-OF-SERVICE

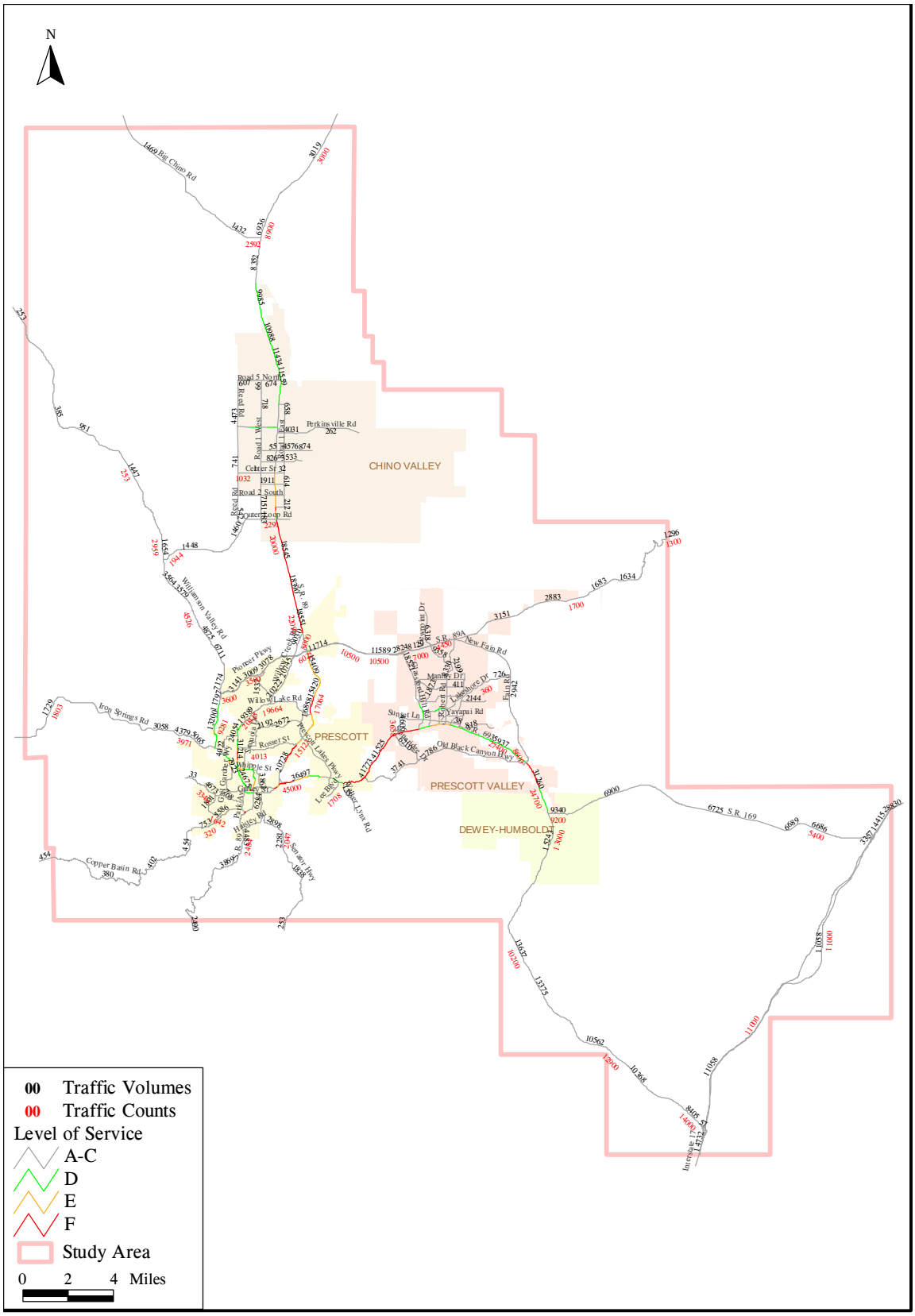


FIGURE 18. CYMPO 2004 TRAFFIC VOLUMES, TRAFFIC COUNTS AND LEVEL-OF-SERVICE - PRESCOTT

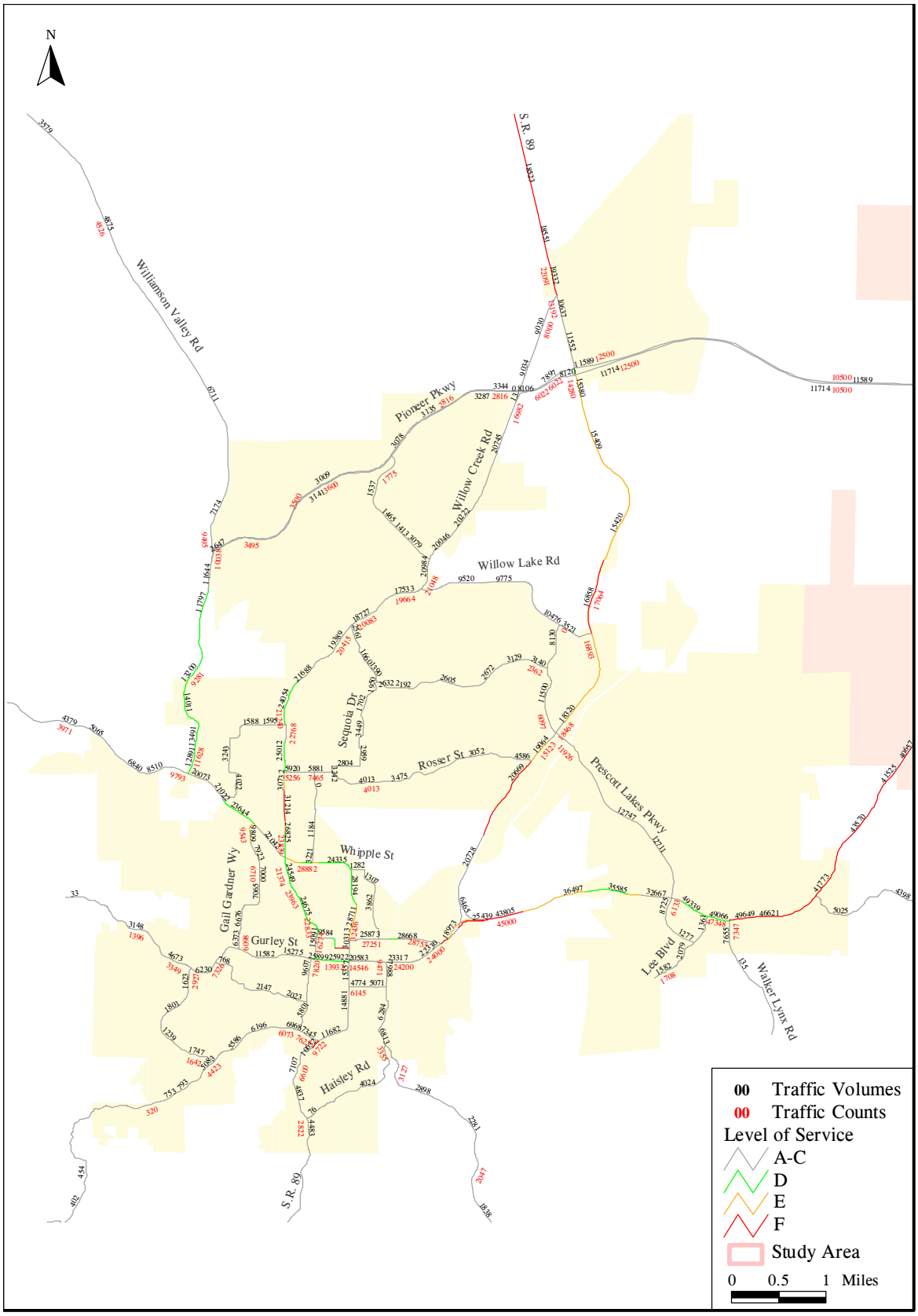


FIGURE 19. CYMPO 2004 TRAFFIC VOLUMES, TRAFFIC COUNTS AND LEVEL-OF-SERVICE – PRESCOTT VALLEY

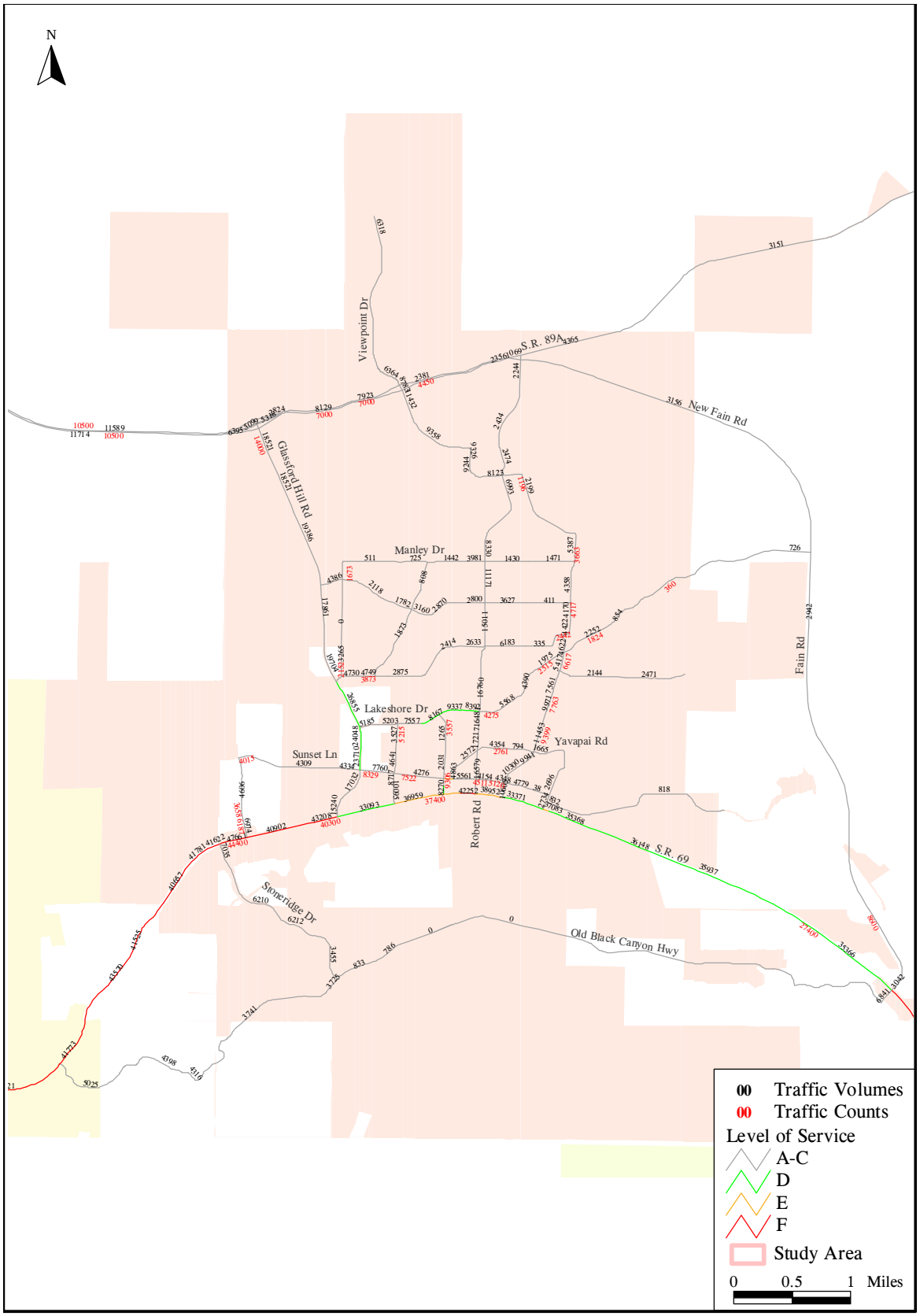
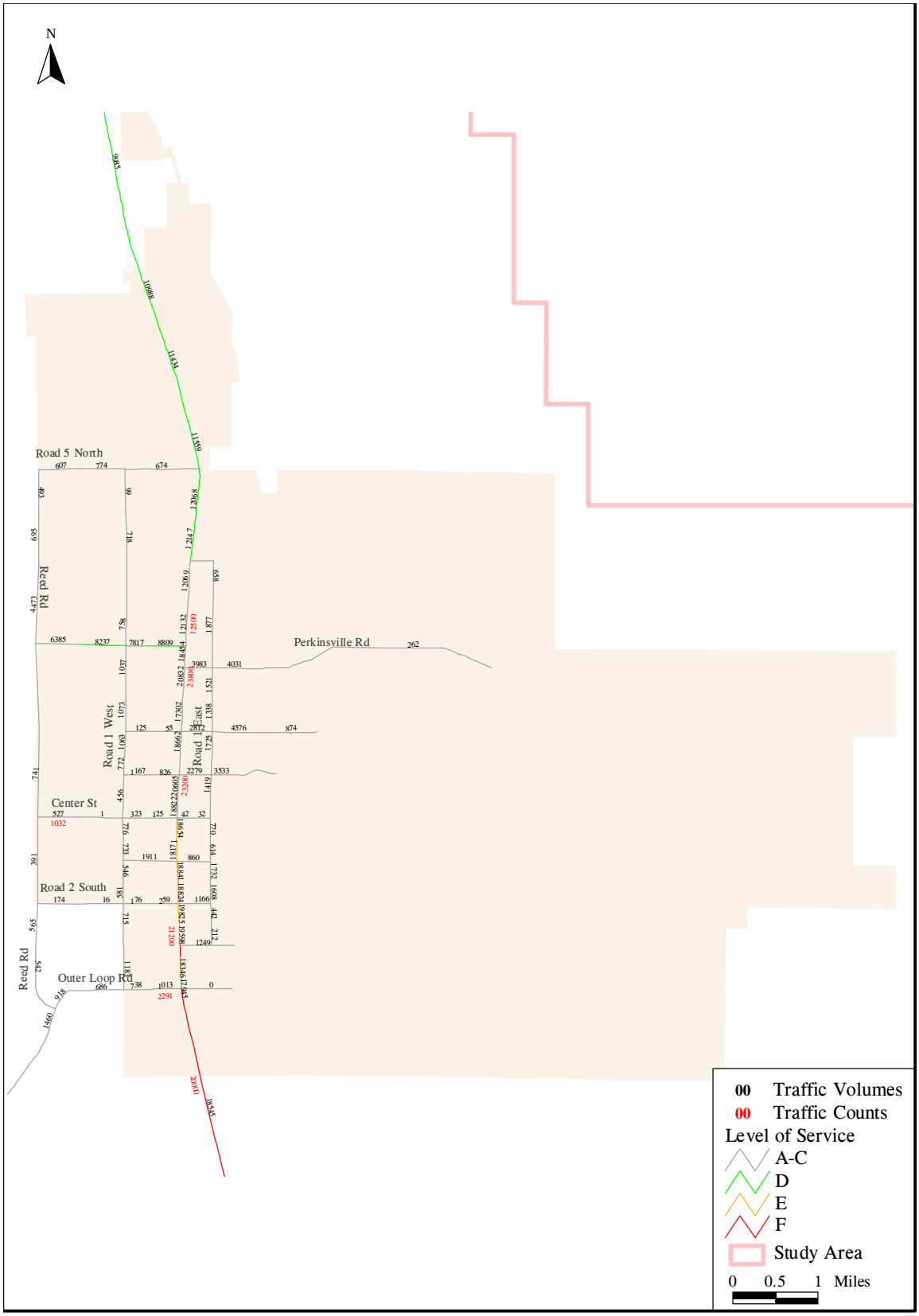


FIGURE 20. CYMPO 2004 TRAFFIC VOLUMES, TRAFFIC COUNTS AND LEVEL-OF-SERVICE – CHINO VALLEY



EXISTING PLANS AND PROGRAMS

A review of existing plans and programs for the Central Yavapai region provides background from which the regional transportation plan can be structured. Reviewed plans and programs include those from Arizona Department of Transportation (ADOT), Yavapai County, City of Prescott, Town of Prescott Valley, and Town of Chino Valley.

Arizona Department of Transportation (ADOT)

The Arizona Department of Transportation has primary jurisdiction over some of the main roadways in the CYMPO region, which includes SR 69, SR 169, SR 89, SR 89A, and I-17. As shown in Table 11, ADOT's five-year construction program has the following projects programmed within the CYMPO region.

TABLE 11. ADOT'S 2006-10 PROGRAMMED PROJECTS WITHIN CYMPO

Roadway	BMP	EMP	Type of Work	Program Year	Cost (Mil)
I-17	262.60	262.70	Archeological Investigation	2006	$200
I-17	263.00		Reconstruct TI at Cordes Junction	2008	$18,980
SR 89	319.2		SR89/SR89A Construct Traffic Interchange	2007	$5,800
SR 89	324.2	331.57	Construct 5 lanes urban roadway to Center Street	2007	$8,820
SR 89	131.8		Sundog Road Bridge - Turnback	2010	$1,400

MoveAZ

The Arizona Long-Range Transportation Plan, know as MoveAZ, provides a 20-year planning guide for ADOT. MoveAZ was developed by building on a variety of existing planning studies to identify transportation needs and develop solutions. The MoveAZ plan includes a set of projects for each ADOT District. These projects were evaluated using a performance analysis and organized by bundle. The projects recommended for the Prescott District, which encompasses the CYMPO region, are shown below in Figure 21.

FIGURE 21. MOVEAZ PROJECTS WITHIN THE CYMPO AREA

Table 6.6 Prescott District Projects

Project	Road	BMP	EMP	County	Description	Cost
16.02	**I-17**	**244.00**	**262.65**	**Yavapai**	**Widen to 6 lanes**	**$60,612,500***
16.02.01	I-17	244.00	262.65	Yavapai	Widen, rural ITS other	
16.02.02	I-17	244.44	252.52	Yavapai	New lanes, rockfall containment, other	
16.03	**I-17**	**278.00**	**286.00**	**Yavapai**	**Widen to 8 lanes**	**$80,250,000**
16.03.01	I-17	278.00	286.00	Yavapai	Widen to 8 lanes	$80,250,000
16.04	**I-17**	**286.00**	**298.98**	**Yavapai**	**Widen to 6 lanes**	**$81,930,000**
16.04.01	I-17	286.00	298.98	Yavapai	Widen	$81,930,000
16.21	**SR 69**	**281.00**	**296.00**	**Yavapai**	**Widen to 6 lanes**	**$48,750,000**
16.21.01	SR 69	281.00	296.00	Yavapai	Widen to 6 lanes	$48,750,000
16.41	**SR 89**	**314.02**	**330.18**	**Yavapai**	**Widen to 4 lanes, 5 lanes**	**$44,000,000**
16.41.01	SR 89	314.02	316.07	Yavapai	Widen to 4 lanes	$8,000,000
16.41.02	SR 89	320.04	325.00	Yavapai	Widen to 4 lanes	$18,000,000
16.41.03	SR 89	325.00	330.18	Yavapai	Widen to 5-lane cross-section	$18,000,000
16.42	**SR 89A**	**320.96**	**329.90**	**Yavapai**	**Widen to 4 lanes**	**$29,055,000**
16.43.01	SR 89A	320.96	329.90	Yavapai	Widen to 4 lanes	$29,055,000
16.51	**SR 260**	**208.60**	**228.00**	**Yavapai**	**Widen to 4 lanes**	**$122,199,800**
16.51.01	SR 260	208.60	212.90	Yavapai	Widen to 4 lanes divided	$26,510,600
16.51.02	SR 260	212.90	218.40	Yavapai	Reconstruct roadway	$26,590,700
16.51.03	SR 260	218.40	222.00	Yavapai	Construct 4-lane divided	$9,369,500
16.51.04	SR 260	222.00	228.00	Yavapai	Reconstruct to 4-lane divided highway	$59,729,000
16.52	**SR 260**	**256.00**	**282.00**	**Gila**	**Widen to 4 lanes**	**$15,412,000**
16.52.01	SR 260	256.00	260.00	Gila	Widen from 2 lanes to 4 lanes	$15,412,000
16.53	**SR 260**	**282.00**	**302.00**	**Coconino, Navajo**	**Widen to 4 lanes**	**$104,000,000**
16.53.01	SR 260	282.00	288.00	Coconino	Reconstruct 2 lanes to 4 lanes	$24,000,000
16.53.02	SR 260	288.00	293.00	Coconino, Navajo	Widen	$20,000,000
16.53.03	SR 260	293.00	302.00	Navajo	Reconstruct 4 lanes	$36,000,000
16.53.04	SR 260	295.00	301.00	Navajo	New WB lanes	$24,000,000

*Estimates of individual project elements are not available separately for this bundle.
Source: ADOT and Vision 21, reviewed by ADOT District Engineers.

Yavapai County

Yavapai County encompasses the entire CYMPO region and extends as far south as Wickenburg and north to the Sedona area. Yavapai County roadways serve as important subregional routes within the CYMPO region, connecting communities and larger state routes. The County is vital in developing and improving a regional transportation system for the CYMPO. Yavapai County's approach to providing transportation can be found in the 2003 Yavapai County General Plan, the 1998 Central Yavapai County Transportation Study Update, and from the County's future reconstruction and improvement plan for regional roads.

The Yavapai County General Plan outlines the overall principles guiding transportation planning for Yavapai County. The Transportation Element of the General Plan contains the transportation goals and objectives and describes the transportation system, as well as discusses alternative modes of transportation, county road program, long-range future projects, and strategies for implementation.

The transportation goals and objectives indicate the County's desire to:

- Preserve scenic routes
- Provide safe access
- Connect communities
- Protect the environment
- Promote alternative modes

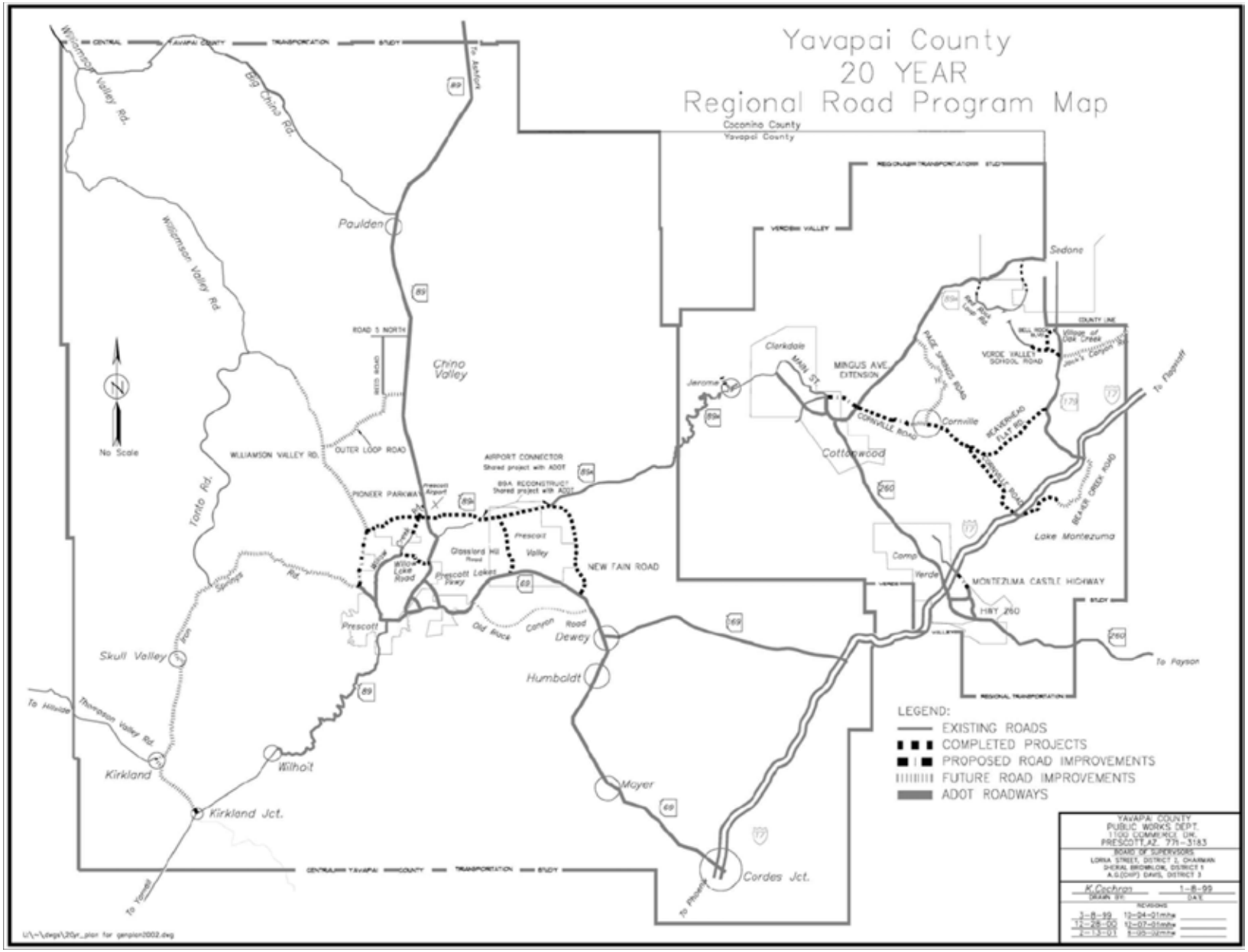
The County roadway system works in tandem with a number of State and Federal highways. The County works closely and cooperatively with ADOT to guide needed improvements to State and Federal routes in the CYMPO region. Additionally, the County operates and maintains an extensive network of major county highways. Important county roadways in the CYMPO region include: Williamson Valley Road, the Outer Loop Road, Pioneer Parkway, Willow Creek Road, Willow Lake Road, and Iron Springs Road.

Yavapai County supports and promotes alternative modes of transportation. The 2003 General Plan indicates the County's commitment to transit, bicycling, and walking throughout the County, and working closely with other agencies.

The Yavapai County Regional Road Program is important to the development of the regional roadway system in the County including the CYMPO area. Long-range regional road plans shown the in 2003 General Plan important to the CYMPO include Glassford Hill Road Northern Extension and Williamson Valley Road. Figure 22, as taken from the General Plan, shows the 20 year regional road program for the county.

Yavapai County is currently updating their CIP program in preparation for approval by the County Board of Supervisors.

FIGURE 22. YAVAPAI COUNTY, 20-YEAR ROAD PROGRAM MAP



City of Prescott

The 2003 City of Prescott General Plan provides guidance for future circulation plans within the City of Prescott. The Prescott General Plan includes discussion on transportation modes, an overview of the local roadway network, promotion of alternative modes, and recommendations for improving traffic safety, management, and planning.

The City of Prescott is dedicated to regional level transportation planning, with a history of working with the other jurisdictions in the CYMPO region. The Prescott General Plan outlines goals and strategies based on their street classification system of major and minor arterials, major and minor collectors, and local streets. Each level of classification has specific goals and strategies, reflecting the function of the facility. Additionally, the General Plan outlines specific goals and strategies supporting bicycling, walking, and transit as well as the airport facility and industrial area.

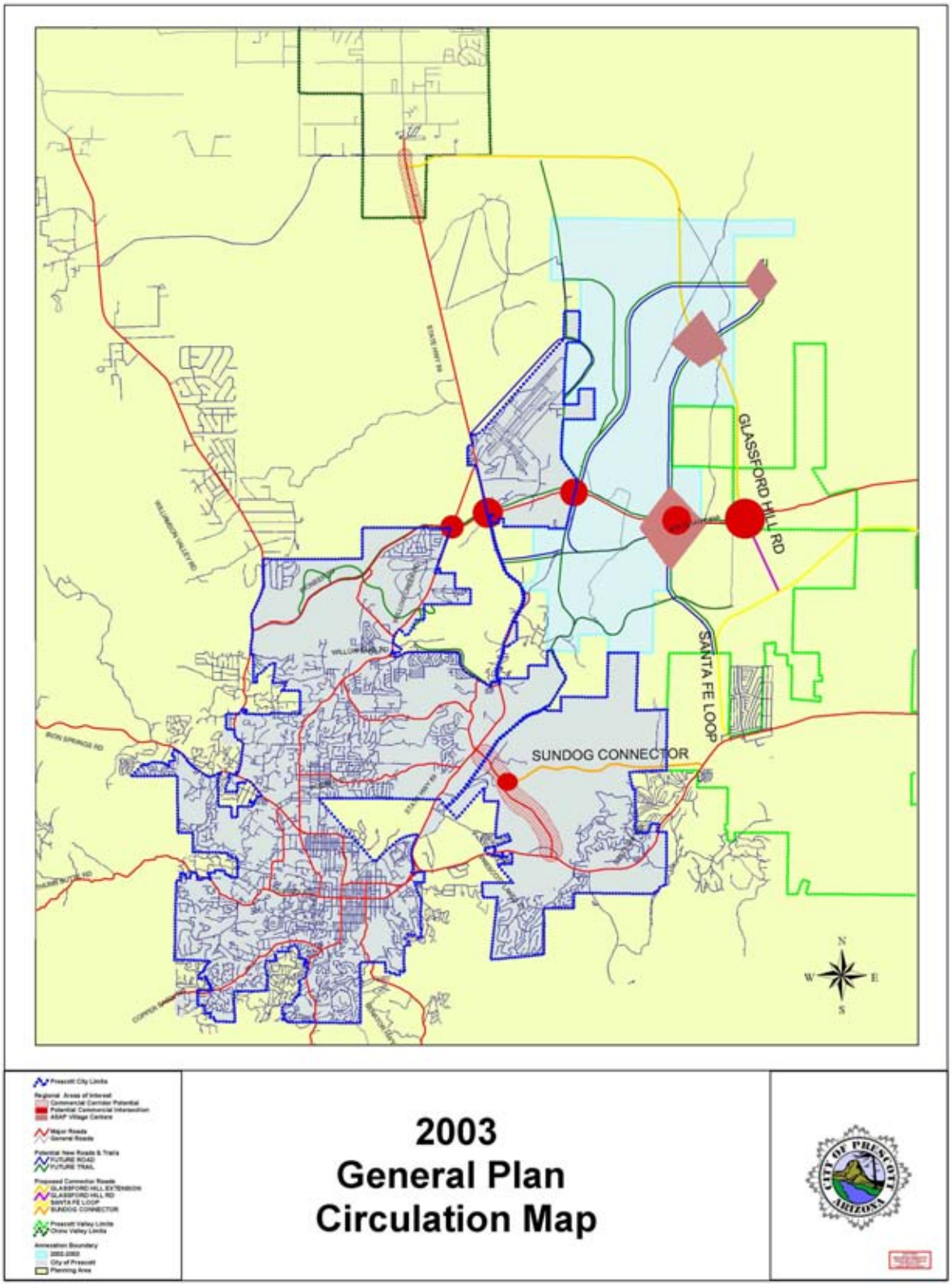
The City of Prescott Annual Budget for fiscal years 04 – 05 includes information on their 5 year Capital Program. Table 12 shows the amounts budgeted for the next fiscal five years for the street and open space fund. Figure 23 shows the Circulation map from the 2004 Prescott General Plan.

TABLE 12. CITY OF PRESCOTT 5-YEAR STREET FUND PROGRAM

	Roadway Capital Projects				
	FY06	**FY07**	**FY08**	**FY09**	**FY10**
1% Streets and Open Space Fund					
Open Space	$1,020,000	$2,525,000	$3,000,000	$3,000,000	$3,000,000
Ruth St. & Demerse	965,000	740,000			
Park Avenue – Gurley to Copper Basin			1,420,000		
Copper Basin Phase I – White Spar – Linden	2,800,000				
Copper Basin Phase II – Linden – Sheriff's PTrl		2,600,000			
Williamson Valley Road – Design/ROW/Utilities	1,500,000				
Williamson Valley Road		5,000,000			
Iron Springs Road Widening	2,625,000				
Total 1% Streets and Open Space Fund	$8,910,000	$10,865,000	$4,420,000	$3,000,000	$3,000,000

Source: City of Prescott Annual Budget for the fiscal year July 1, 2004 - June 30, 2005

FIGURE 23. CITY OF PRESCOTT, CIRCULATION MAP



Source: 2004 City of Prescott General Plan

Town of Prescott Valley

The Town of Prescott Valley in recent years developed two documents to guide future circulation improvements: the 2020 General Plan and the 2002 Streets & Infrastructure Committees' Final Report and Recommendations. The Circulation Element of the 2020 General Plan details existing travel conditions in Prescott Valley. The plan includes recommendations for improving the roadway network for autos, bicycles, and pedestrians, and a set of goals and objectives to implement the recommendations. Table 13 shows the 5 year program for street projects as published in the Prescott Valley Annual Budget.

TABLE 13. TOWN OF PRESCOTT VALLEY 5-YEAR STREET PROJECTS

	Roadway Capital Projects					
	2004-05	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**Total**
Agua Fria Channel			$750,000			$750,000
Bike & Ped Improvements CS0325		100,000	100,000	100,000		300,000
Crosstown Trail Improvements CS0319	605,000					605,000
Florentine, Lake Valley to Yavapai CS0321	1,025,887					1,025,887
Hondo Drive – Long Mesa to Ranger			1,520,000			1,520,000
Lakeshore Electric – Holiday Lights CS0507	10,000					10,000
Lakeshore Enhancements CS0315						-
Lakeshore TI, County Pmt. ¾ CS0324	250,000	240,000				490,000
Powers Drive Enhancement CS0310	30,000					30,000
Rails to Trails CS0309	100,000					100,000
Ranger Road – Navajo to Hondo			1,014,000	2,366,000		3,380,000
Roundup Industrial District		175,000	1,000,000	4,473,000		5,648,000
Signal Upgrades		50,000	50,000	50,000		150,000
Signal Highest Priority			220,000	250,000		470,000
Signal Granville Design CS0320	10,000	182,000				192,000
Stoneridge/SR69 Lanes			1,000,000			1,000,000
Street Lights – Major Intersections		50,000	50,000	50,000		150,000
Viewpoint Dr.-89A Intersection CS0501	200,000					200,000
Viewpoint/Manley to Roundup			3,380,000			3,380,000
Yavapai Road East – Robert to Navajo			1,225,000			1,225,000
Total Streets Capital Projects	$2,230,887	$797,000	$10,309,000	$7,289,000	-	$20,625,887

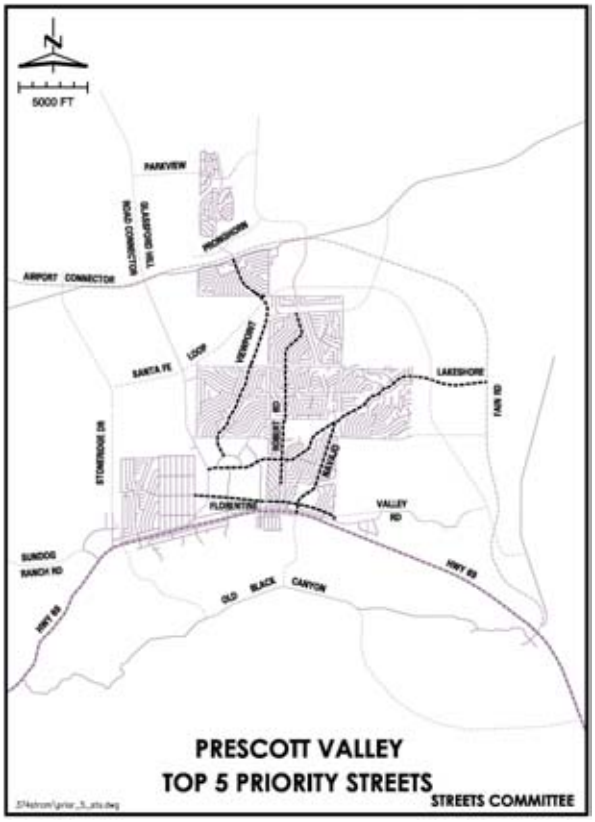
Source: Town of Prescott Valley Annual Budget

The General Plan also details anticipated roadway conditions, needed improvements to accommodate future traffic, and recommends the need for future roads as shown in Figure 24. The Town of Prescott Valley 2002 Streets & Infrastructure Committee Report contains detailed recommendations for improving traffic conditions in Prescott Valley. The report sets recommendations for design elements and standards, construction priorities, and funding mechanisms and alternatives. The top five priority streets recommended in this report are shown in Figure 25, as taken from the report appendix.

FIGURE 24. FUTURE ROADS, PRESCOTT VALLEY

Source: Prescott Valley 2020 General Plan.**

FIGURE 25. TOP 5 PRIORITY STREETS, PRESCOTT VALLEY



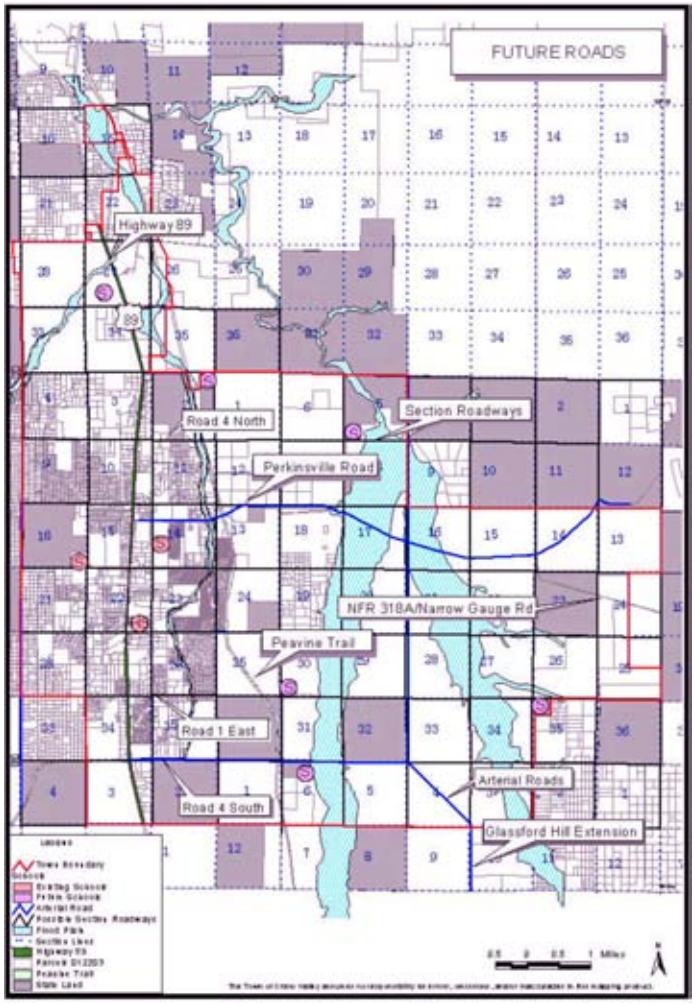
Source: The Town of Prescott Valley 2002 Streets & Infrastructure Committee Report
Note: Fain Road and Lakeshore Drive have already been constructed.

Town of Chino Valley

The Town of Chino Valley 2020 General Plan provides guidance for future circulation needs. Specifically, the Circulation Element contains an overview of the street system; existing travel conditions; future needs and expectations; and a set of principles, goals, and objectives to achieve future needs.

Chino Valley is oriented along State Highway 89, which is an ADOT facility. Highway 89 connects Chino Valley to the rest of the CYMPO region as well as connecting north to I-40. Recognizing the importance of Highway 89, Chino Valley's plans to improve the highway through the town include access control, multimodal accommodations, and connections to the local street network. Figure 26 shows future road improvements from the 2020 General Plan. Chino Valley is planning on conducting a Small Area Transportation Study in the near future to further refine their transportation plans.

FIGURE 26. TOWN OF CHINO VALLEY FUTURE ROADS



Source: Chino Valley 2020 General Plan

3. FUTURE REGIONAL CONDITIONS

FUTURE SOCIOECONOMIC CONDITIONS

Growth Forecasts

Population projections for the Central Yavapai study area were derived from forecasted numbers of future dwelling units based on the adopted land use plans from each jurisdiction. Each individual jurisdiction determined the percentage of land use built by the year 2030. The ratio of population to dwelling units from the Census 2000 results were adjusted to reflect the national trend of smaller family size in the determination of the final population projections. Also contributing to the lower population per dwelling unit ratio is the assumption of an increasing presence of retirees among the population. The planning and public works staffs of the area jurisdictions have actively participated in creating and adjusting these future projections. During the development of the socioeconomic data, constraints in future water supplies and economics were not considered. The primary reason for the omission of these considerations was to address the transportation needs of a fully implemented general land use plan.

To estimate future traffic levels, the number of forecasted occupied dwelling units is the variable used in generating trips. Projections for year 2030 dwelling units were derived from the amount of residential acreage specified in the general plans adopted by area jurisdictions. The number of employees is the variable used in attracting trips. Year 2030 employment data was developed by converting the amount of non-residential acreage in the area jurisdictions' General Plans to numbers of employees. Each local agency determined their percent build-out by 2030. The jurisdictional data was populated to the TAZ and provided to the local agencies for review and comment. Upon completion of revisions, local agencies gave final approval. Regional totals were calculated and Table 14 shows the resulting 2030 population projections compared with the 2004 population by jurisdiction. The 2030 population for the study area is estimated to be 439,389.

TABLE 14. 2004 AND 2030 POPULATION TOTALS BY JURISDICTION

Jurisdiction	Local Estimate 2004	Local Estimate 2030	Increase	Percent Growth
Chino Valley	10,254	30,830	20,576	200.66%
Prescott	44,732	102,339	57,607	128.78%
Prescott Valley	33,504	87,902	54,398	162.36%
Unincorporated Yavapai County	25,371	188,412	163,041	642.63%
Yavapai-Prescott Nation	181	361	180	99.45%
Dewey-Humboldt (Town)	3,629	29,545	25,916	714.14%
Total	**117,671**	**439,389**	**321,718**	**273.40%**

Note: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.

Note that the 2030 projections for Prescott and Prescott Valley includes areas outside their current boundaries, but shown in their future planning areas which were assumed to be annexed in the future. The study area population is expected to grow by nearly 274 percent overall by 2030. Dewey-Humboldt and unincorporated county areas of the study area are expected to experience the most growth by 2030 with 714 percent and 642 percent increases in population, respectively. Estimates show over 188,000 people living in unincorporated parts of the study area by 2030, with Prescott remaining the largest jurisdiction with a population of just over 102,000.

Table 15 shows the projected dwelling units for the study as compared to current estimates. Overall, the number of dwelling units in the study area is projected to increase by almost 292 percent. Dewey-Humboldt and unincorporated sections of the study area have the highest percent change with 882 and 710 percent respectively, with all other areas seeing well over 100 percent growth. Unincorporated parts of the study area are projected to have the largest number of occupied dwelling units by 2030, with just over 84,000 units, followed by Prescott and Prescott Valley.

TABLE 15. 2004 AND 2030 DWELLING UNIT TOTALS BY JURISDICTION

Jurisdiction	2004 Local Estimates of Occupied DU's	2030 Local Estimates of Occupied DU's	Increase	Percent Growth
Chino Valley	3,820	12,207	8,387	219.55%
Prescott	20,021	45,859	25,838	129.05%
Prescott Valley	12,881	34,617	21,736	168.75%
Unincorporated Yavapai County	10,365	84,007	73,642	710.49%
Yavapai-Prescott Nation	54	108	54	100.00%
Dewey-Humboldt (Town)	1,314	12,909	11,595	882.45%
Total	**48,455**	**189,708**	**141,253**	**291.51%**

Note: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.

Note that the 2004 average persons-per-dwelling-unit ratio is 2.43, while the same ratio for 2030 is 2.32. This is due to the decreasing family size trend seen nationwide and the increased number of retirees expected to move to the area in the future.

Each of the participating jurisdictions reviewed future employment projections for their community. Table 16 shows 2030 total employment projections compared to 2004 total employment. In terms of percent change, Chino Valley and Prescott Valley are forecasted to have the largest growth. Prescott will continue to have the greatest overall number of employees in the study area with just over 43,000 by 2030.

TABLE 16. 2004 AND 2030 EMPLOYMENT TOTALS BY JURISDICTION

Jurisdiction	2004 Local Estimates of Total Employment	2030 Local Estimates of Total Employment	Increase	Percent Growth
Chino Valley	2,285	6,339	4,054	177.42%
Prescott	19,038	43,075	24,037	126.26%
Prescott Valley	8,977	24,315	15,338	170.86%
Unincorporated Yavapai County	3,776	8,825	5,049	133.71%
Yavapai-Prescott Nation	1,729	2,579	850	49.16%
Dewey-Humboldt (Town)	43	107	64	148.84%
Total	**35,848**	**85,240**	**49,392**	**137.78%**

Note: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.

Traffic Analysis Zone Allocations

The above socioeconomic data was allocated to TAZs as the next step in the traffic modeling process. TAZ's help distribute people, households, and employees to appropriate areas within the study area, to represent where concentrations are expected to occur, based on known land use plans and real-world conditions. TAZs are generally bounded by either the roadway network or other geographic boundaries. TAZ boundaries extend beyond the CYMPO planning area to include the future growth and its affect on travel demand in this area. The estimated 2030 study area demographic data, including population, dwelling units, and employment was spatially allocated to the TAZs.

Figure 27 shows the TAZ boundaries developed for this study, while Figure 28 depicts the population densities by TAZ for 2004 and 2030.

FIGURE 27. TRAFFIC ANALYSIS ZONES

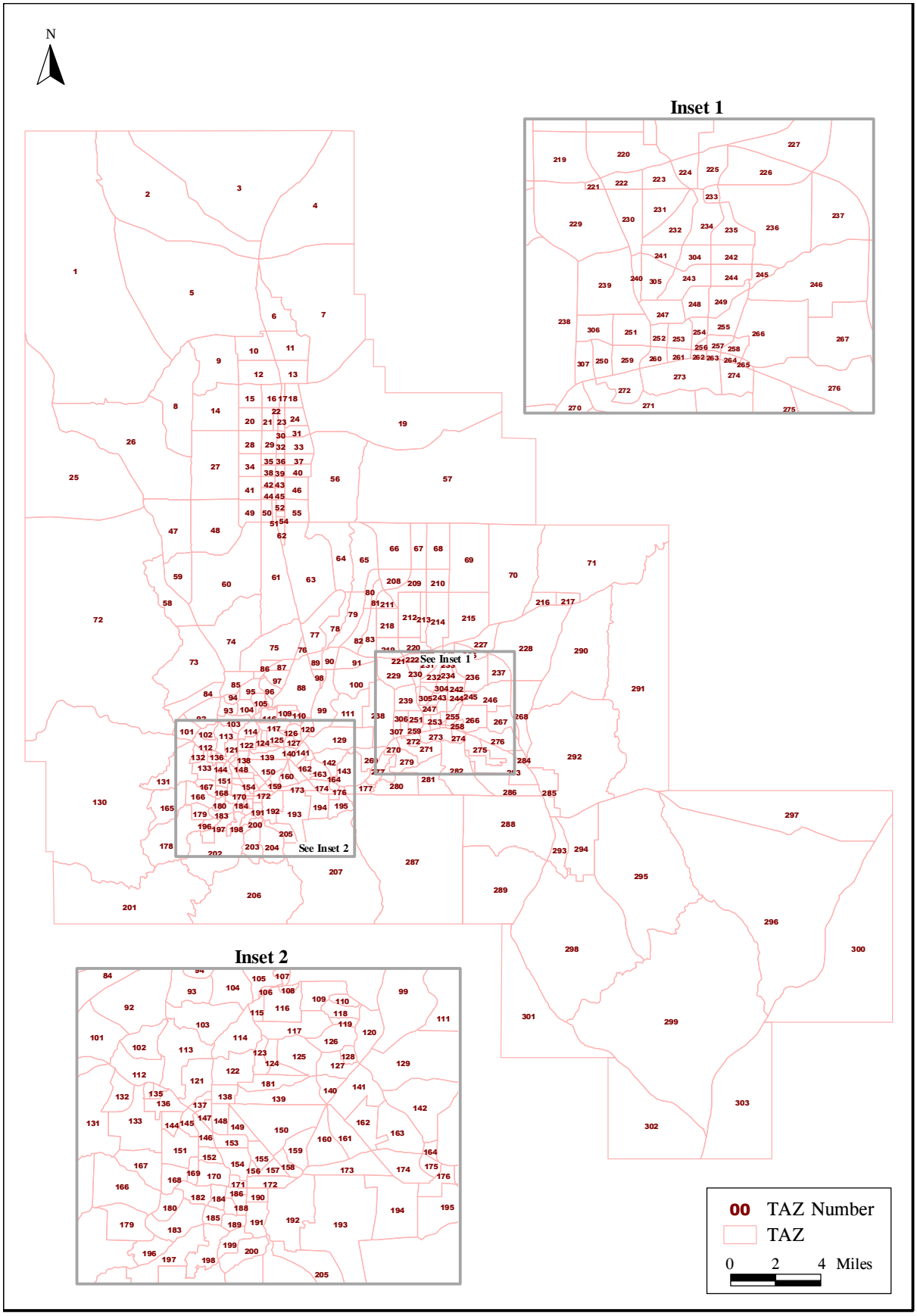
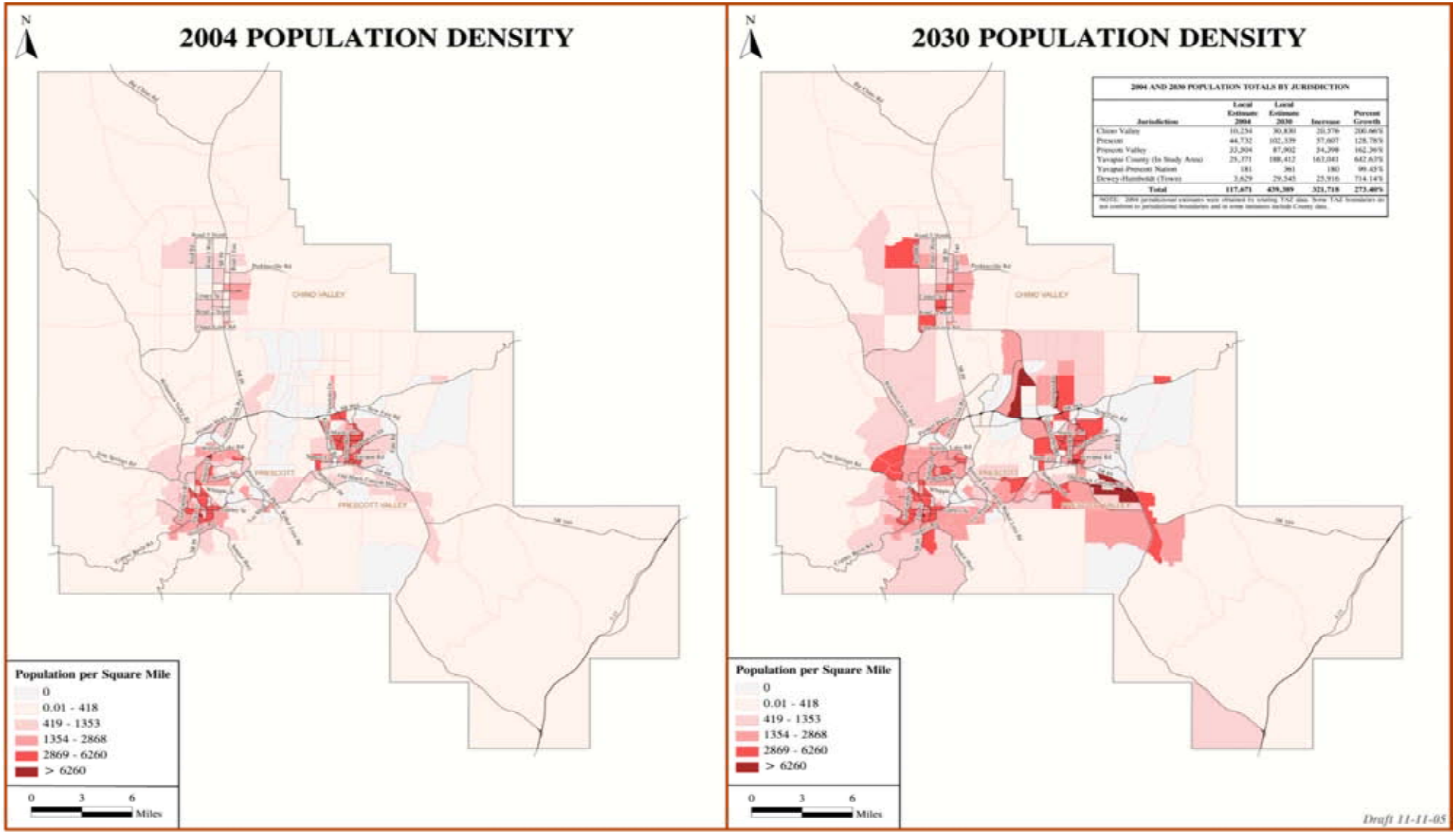


FIGURE 28. POPULATION DENSITIES



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Jurisdiction	Local Estimate 2004	Local Estimate 2030	Increase	Percent Growth
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Prescott Valley	33,304	87,902	54,598	162.36%
Yavapai County (In Study Area)	25,371	188,412	163,041	642.63%
Yavapai-Prescott Nation	181	361	180	99.45%
Dewey-Humboldt (Town)	3,629	29,545	25,916	714.14%
Total	**117,671**	**439,389**	**321,718**	**273.40%**

NOTE: 2004 jurisdictional estimates were obtained by totaling TAZ data. Some TAZ boundaries do not conform to jurisdictional boundaries and in some instances include County data.

FUTURE ROADWAY AND TRAFFIC CONDITIONS

2030 Base Network

The 2030 base roadway network includes roadway improvements detailed in the circulation element of each jurisdiction's General Plan. Long range roadway improvement programs, if available, were also considered. State routes include improvements listed in the ADOT 5-year program for the 2030 base scenario. Figure 29 shows the 2030 base network displaying the number of lanes for each facility and includes the following assumptions:

Six lanes new/improved

- Glassford Hill Road Extension
- Side Road
- Great Western Blvd

Four lanes new/improved

- Sundog Connector
- Indian Connector
- Fain Road
- Williamson Valley Road
- Santa Fe Loop
- SR 89 in Chino Valley
- Outer Loop Road
- Side Road Connector

Two lanes new

- Santa Fe Loop
- Airport Loop Road
- Valley View Ext

2030 Base Network With MoveAZ

This scenario includes all the assumptions for the 2030 base network and assumes the additional improvements for State Routes as detailed in MoveAZ. The MoveAZ projects for the study area include the following as reflected in Figure 30.

Six lanes new/improved

- SR 69 from SR 169 to SR 89
- I-17 in the study area

Four lanes new/improved

- SR 89 from SR 69 to Road 3 North, exclusive of the Granite Dell area
- SR 89A East of Fain Road

FIGURE 29. 2030 BASE NETWORK WITH NUMBER OF LANES

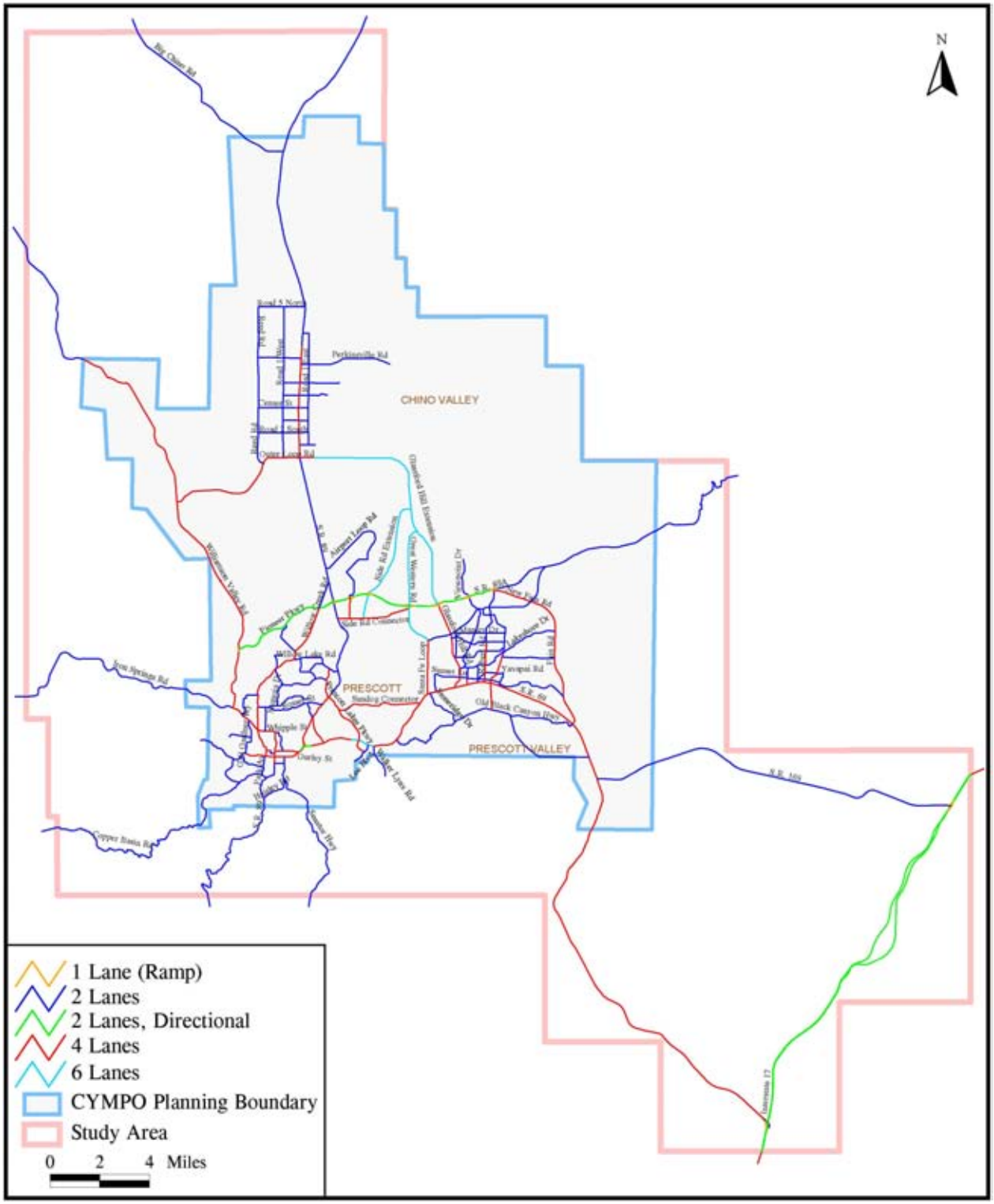
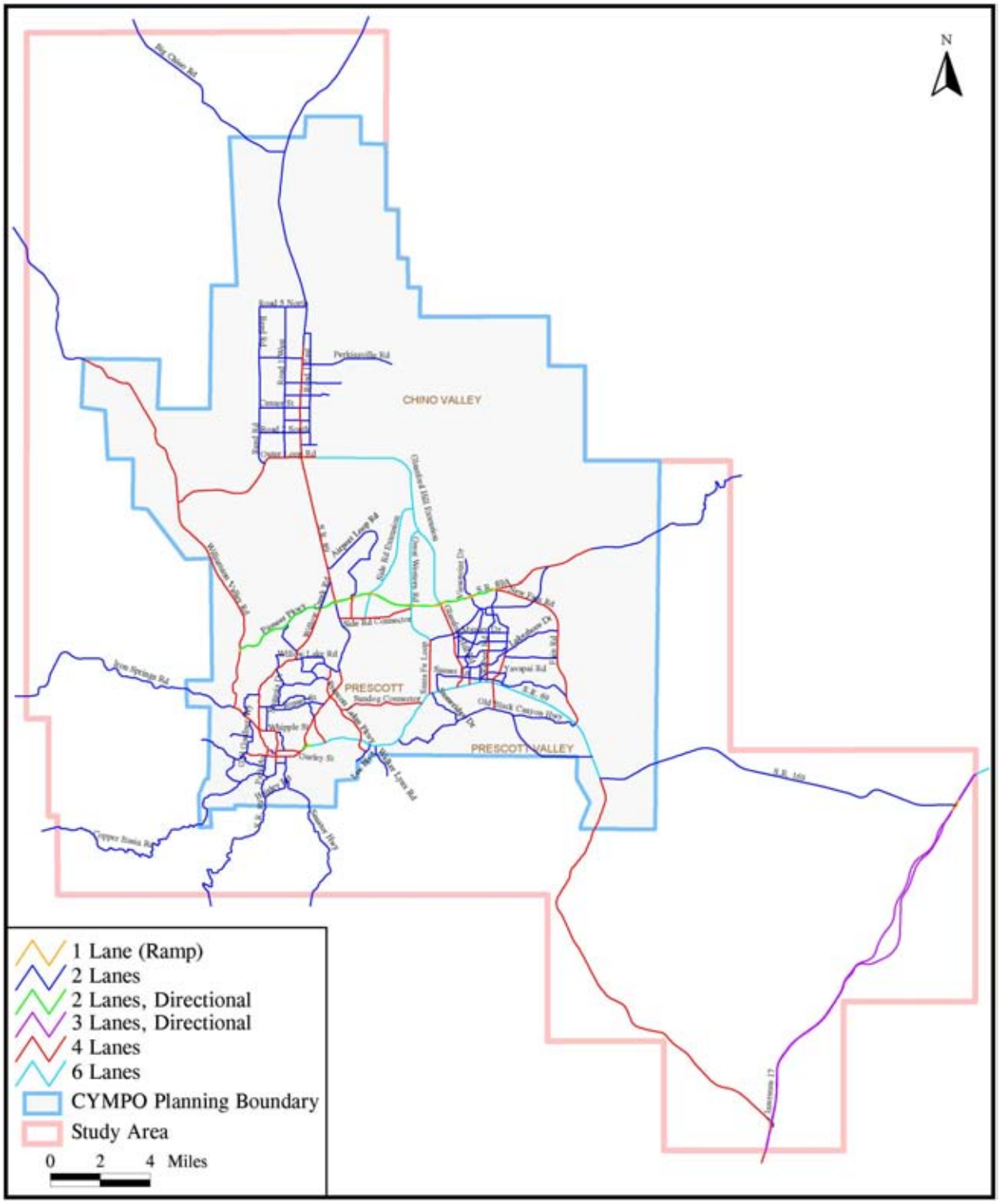


FIGURE 30. 2030 BASE NETWORK AND MOVEAZ WITH NUMBER OF LANES



Future Traffic Volumes

Future traffic volumes were estimated for 2030 based on the future socioeconomic data using the calibrated TransCAD traffic forecasting model. Figures 29, 31, and 32 illustrate the projected traffic volumes and level of service for the Base Network, while figures 30, 33, and 34 reflect the Base Network/MoveAZ scenario.

NETWORK DEFICIENCIES

Deficiencies were identified for the future network based on the estimated level of service (LOS) for 2030. Level of service for each street segment was estimated as a function of the volume-to-capacity ratio (v/c). The roadway capacities were developed for the base year model using the 2000 Highway Capacity Manual and Software planning level method. Arterial LOS is based on the 24-hour average through-vehicles traveling over the length of the arterial segment. The level of service is calculated in the mid-block of each roadway segment and is not constrained by any traffic signals. Levels of service range from A to F, where LOS A represents free flow and LOS F represents forced traffic flow (congestion). For planning purposes, LOS C is considered a desirable level of service. However, most fast growing communities have adopted LOS D as an acceptable future roadway level of service. Therefore, streets with LOS E or worse were identified as potential candidates for improvement. Table 17 shows the level of service thresholds.

TABLE 17. LEVEL OF SERVICE THRESHOLDS

LOS	Maximum V/C
A	0.28
B	0.47
C	0.75
D	0.89
E	.99
F	≥ 1.00

Source: Transportation Research Board, *Highway Capacity Manual*

2030 Base Network Forecasted Volumes and LOS

Future estimated traffic volumes and levels of service D or worse for the 2030 Base Network are illustrated in Figure 31 with an inset of the Prescott/Prescott Valley area in Figure 32. Most of the future roadway systems function at level of service F, even with the planned and programmed improvements from all participating jurisdictions for the next 25 years. A sample of 2030 daily traffic volumes on roadway segments are presented in Table 18.

FIGURE 31. 2030 BASE NETWORK FORECASTED VOLUMES AND LOS

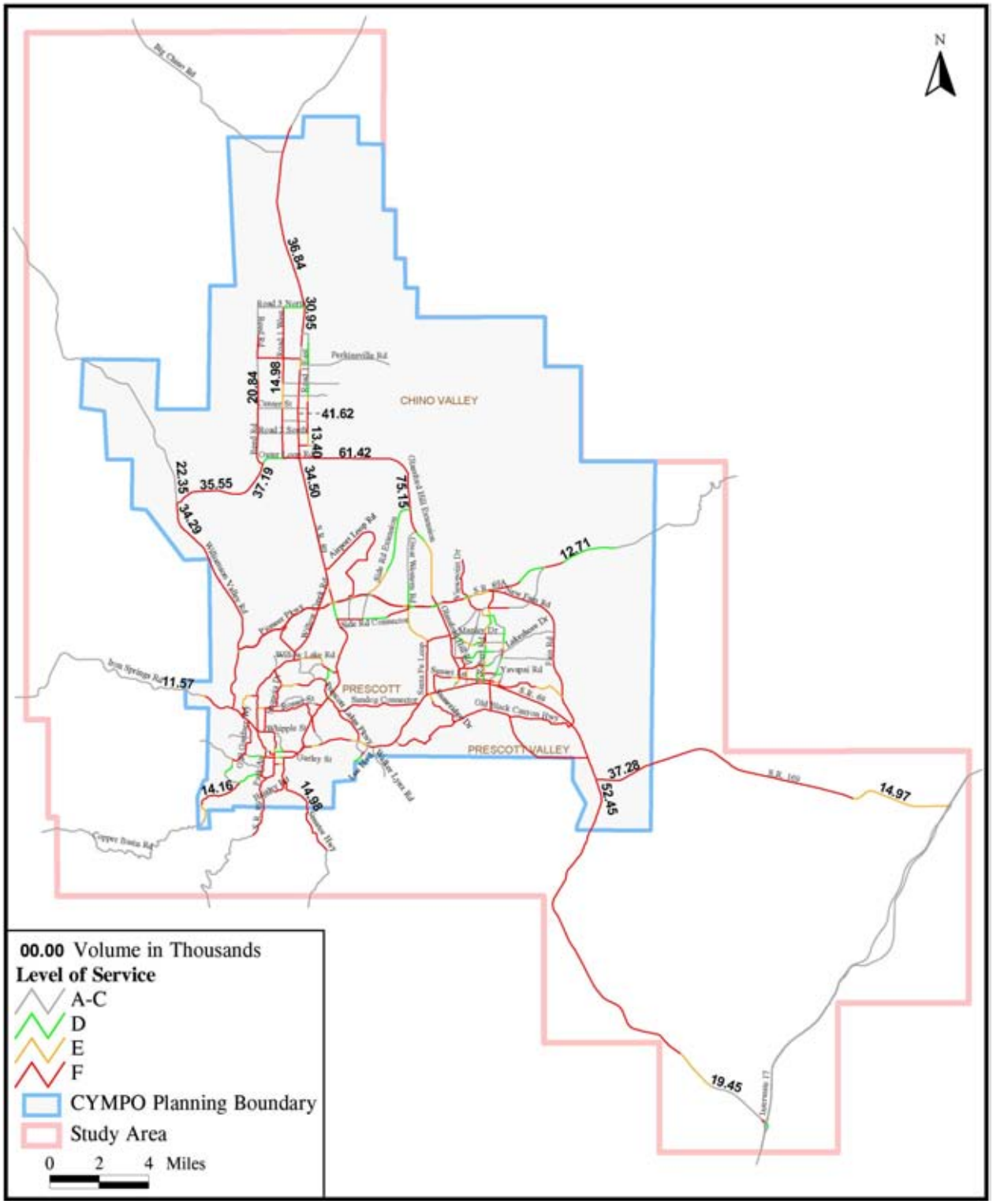


FIGURE 32. 2030 BASE NETWORK FORECASTED VOLUMES AND LOS (INSET)

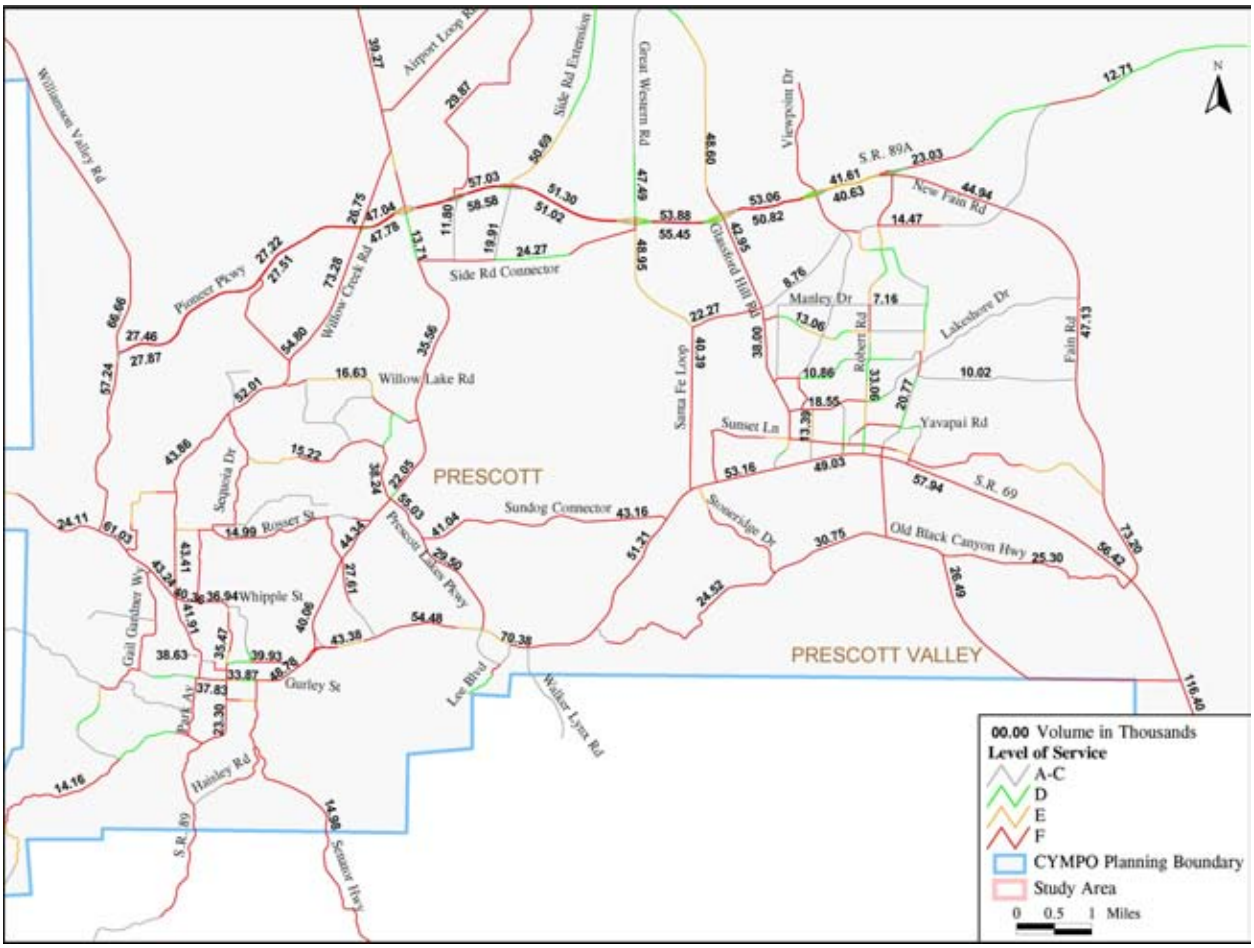


TABLE 18. 2030 FORECASTED VOLUMES BY ROADWAY SEGMENT - BASE

Roadway	Where	Daily Volume
SR 89	South of Outer Loop	34,500
SR 89	North of SR 69	40,600
SR 89A	East of Larry Caldwell	116,500
SR 89A	East of Glassford Hill Road	103,900
SR 69	South of SR 169	52,500
SR 69	West of Glassford Hill Road	53,100
SR 69	Near Lee Boulevard	70,400
Pioneer Parkway	East of Commerce Drive	54,700
Fain Road	South of Lakeshore Drive	47,100
Willow Creek Road	South of Willow Lake Road	52,000
Glassford Hill Road	South of SR 89A	49,000
Glassford Hill Road Ext.	East of Outer Loop Road	61,400
Williamson Valley Road	North of Pioneer Parkway	66,700
Prescott Lake Parkway	South of SR 89	55,000

Base Network with MoveAZ Forecasted Volumes and LOS

Future estimated traffic volumes and levels of service for the 2030 Base Network with MoveAZ are illustrated in Figure 33 with an inset of the Prescott/Prescott Valley area in Figure 34. As with the Base scenario, most of the future roadway systems function at level of service F, even with the planned and programmed improvements from all participating jurisdictions for the next 25 years, including the MoveAZ projects. Samples of 2030 daily traffic volumes on roadway segments are presented in Table 19. As can be expected, with the improvements to SR 69 and SR 89 to six lanes and four lanes respectively, the traffic volumes increased on these two facilities, while reducing volumes on the surrounding arterials.

TABLE 19. 2030 FORECASTED VOLUMES BY ROADWAY SEGMENT – MOVEAZ

Roadway	Where	Daily Volume
SR 89	South of Outer Loop	48,400
SR 89	North of SR 69	37,300
SR 89A	East of Larry Caldwell	105,300
SR 89A	East of Glassford Hill Road	98,800
SR 69	South of SR 169	52,500
SR 69	West of Glassford Hill Road	72,700
SR 69	Near Lee Boulevard	85,900
Pioneer Parkway	East of Commerce Drive	52,300
Fain Road	South of Lakeshore Drive	42,300
Willow Creek Road	South of Willow Lake Road	47,800
Glassford Hill Road	South of SR 89A	40,300
Glassford Hill Road Ext.	East of Outer Loop Road	53,800
Williamson Valley Road	North of Pioneer Parkway	60,800
Prescott Lake Parkway	South of SR 89	50,900

Another way to relate the impact of the 2030 projected traffic volumes on the arterial system is to calculate future travel speeds. A brief travel speed analysis for this alternative was performed on the state routes and the resulting speed ranges are displayed in Table 20.

TABLE 20. 2030 FORECASTED SPEED RANGES

Roadway	From	To	Speed Range
SR 69	Prescott	Prescott Valley	05 – 15 mph
SR 89	Outer Loop Road	Willow Lake Road	05 – 15 mph
SR 89A	SR 89	Glassford Hill Road	15 – 20 mph

FIGURE 33. 2030 BASE NETWORK WITH MOVEAZ FORECASTED VOLUMES AND LOS

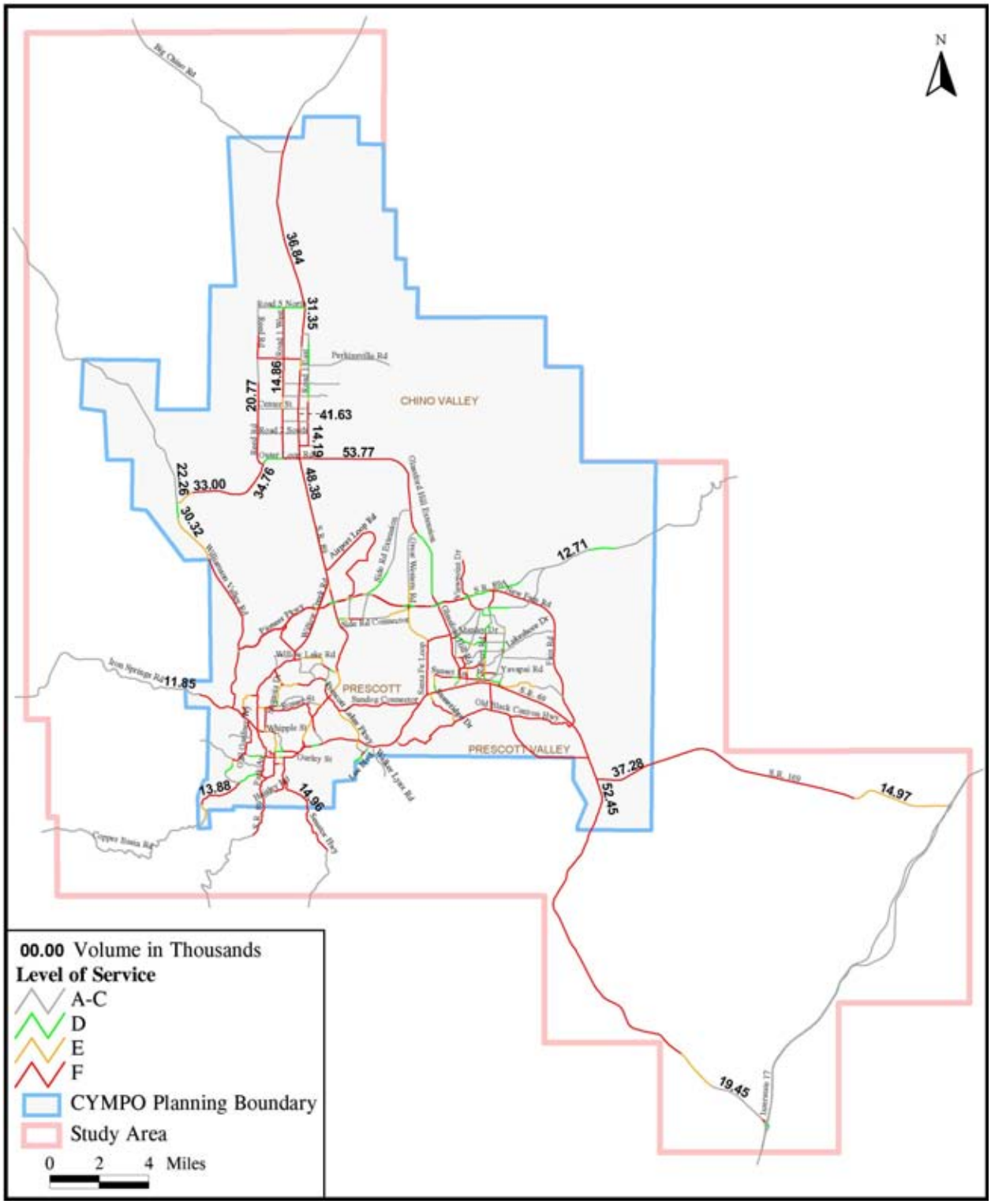
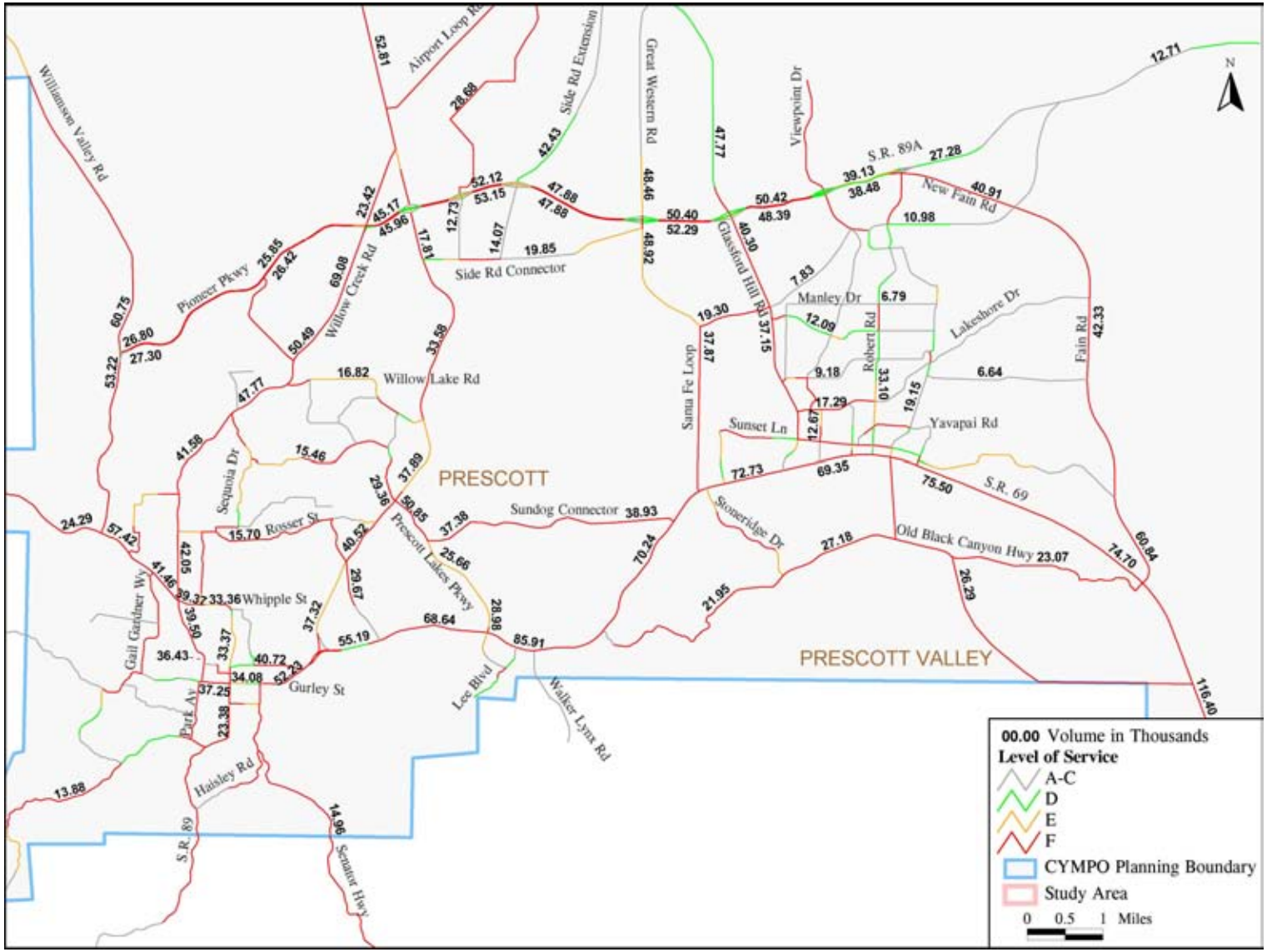


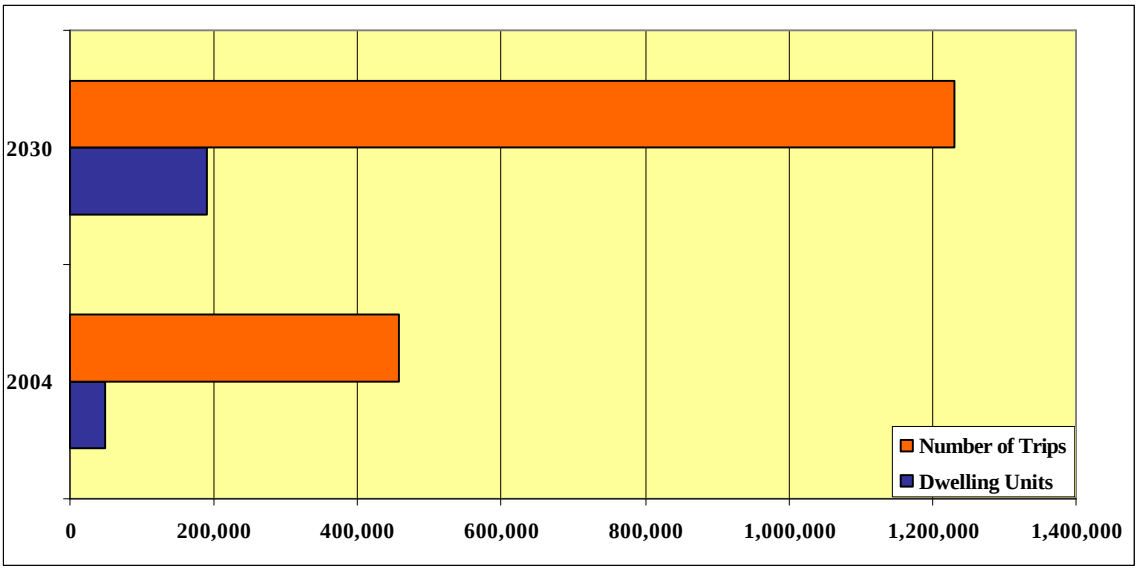
FIGURE 34. 2030 BASE NETWORK WITH MOVEAZ FORECASTED VOLUMES AND LOS (INSET)



Travel Demand Needs

Analyzing travel demand helps identify primary corridors of future travel while evaluating demand and supply of the transportation system. Figure 35 shows a comparison of 2004 and 2030 dwelling units versus the number of trips for the study area. Population growth, measured by the number of dwelling units, produces significant increases in trips and traffic. By 2030, the CYMPO study area is expected to produce just over 1.2 million vehicle trips per day based on expected growth projections.

FIGURE 35. DWELLING UNITS VS. NUMBER OF TRIPS



The next step is to understand the impact of increased travel demand on the roadway system and the capacity of the system to accommodate future traffic. To assess demand versus capacity, corridors were identified utilizing imaginary lines crossing existing and future roadways, Figure 36. These corridors identify travel movements (i.e. north-south or east-west). Additionally, these corridors establish the magnitude and location of the demand, the available supply, and assess unmet travel needs using forecasted traffic volumes and roadway capacities. For this analysis, the 2030 Base with MoveAZ improvement scenario was used.

Table 21 presents the results of the demand analysis for each of four corridors. The analysis for each of the corridors shows demand is greater than available future capacity, which is also shown graphically in Figure 37. Demand is 30 percent greater than capacity regionwide. This translates to a need for 17 additional arterial travel lanes in the East-West direction and 13 additional arterial travel lanes in the North-South direction.

FIGURE 36. TRAVEL DEMAND ANALYSIS CORRIDORS

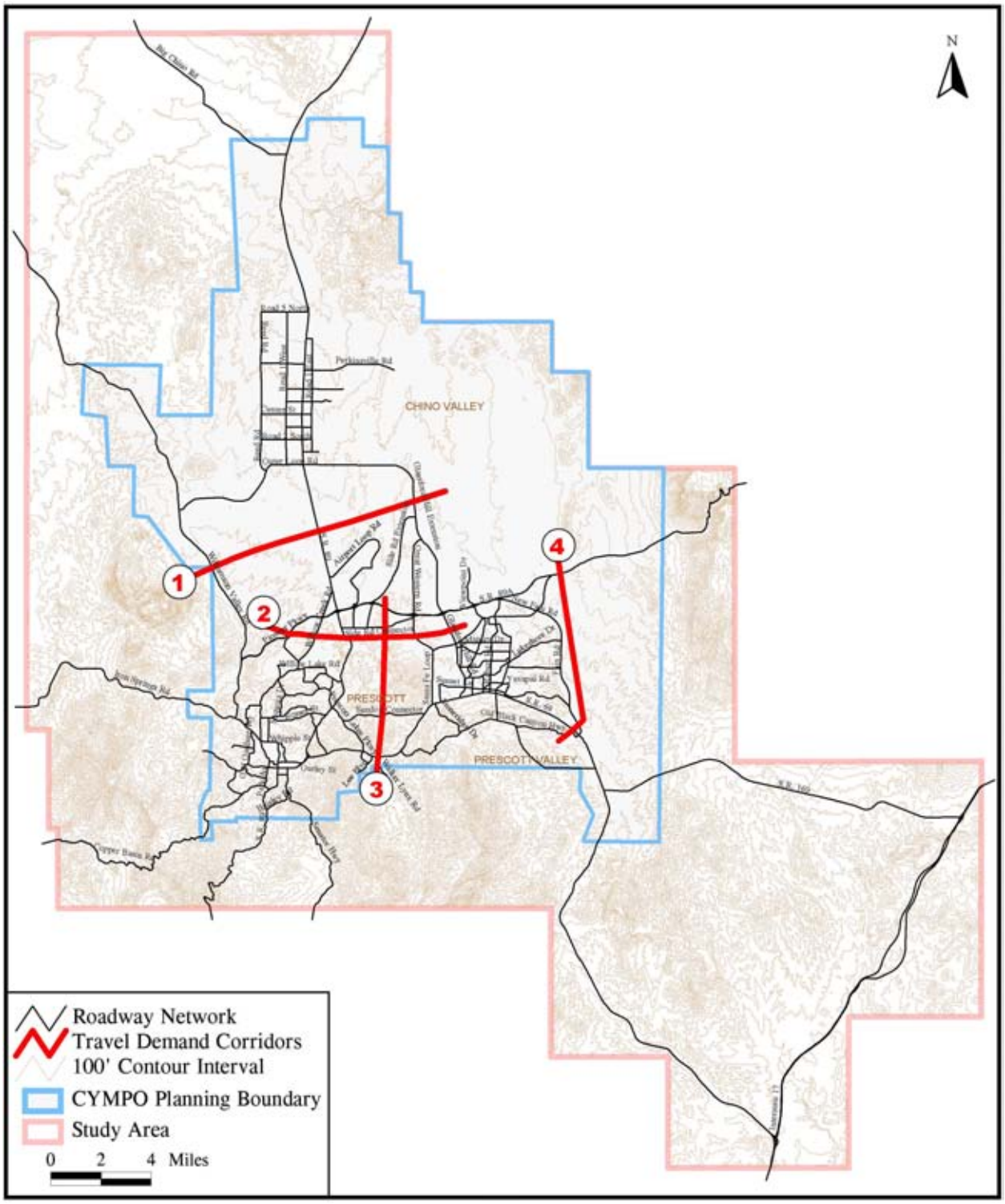
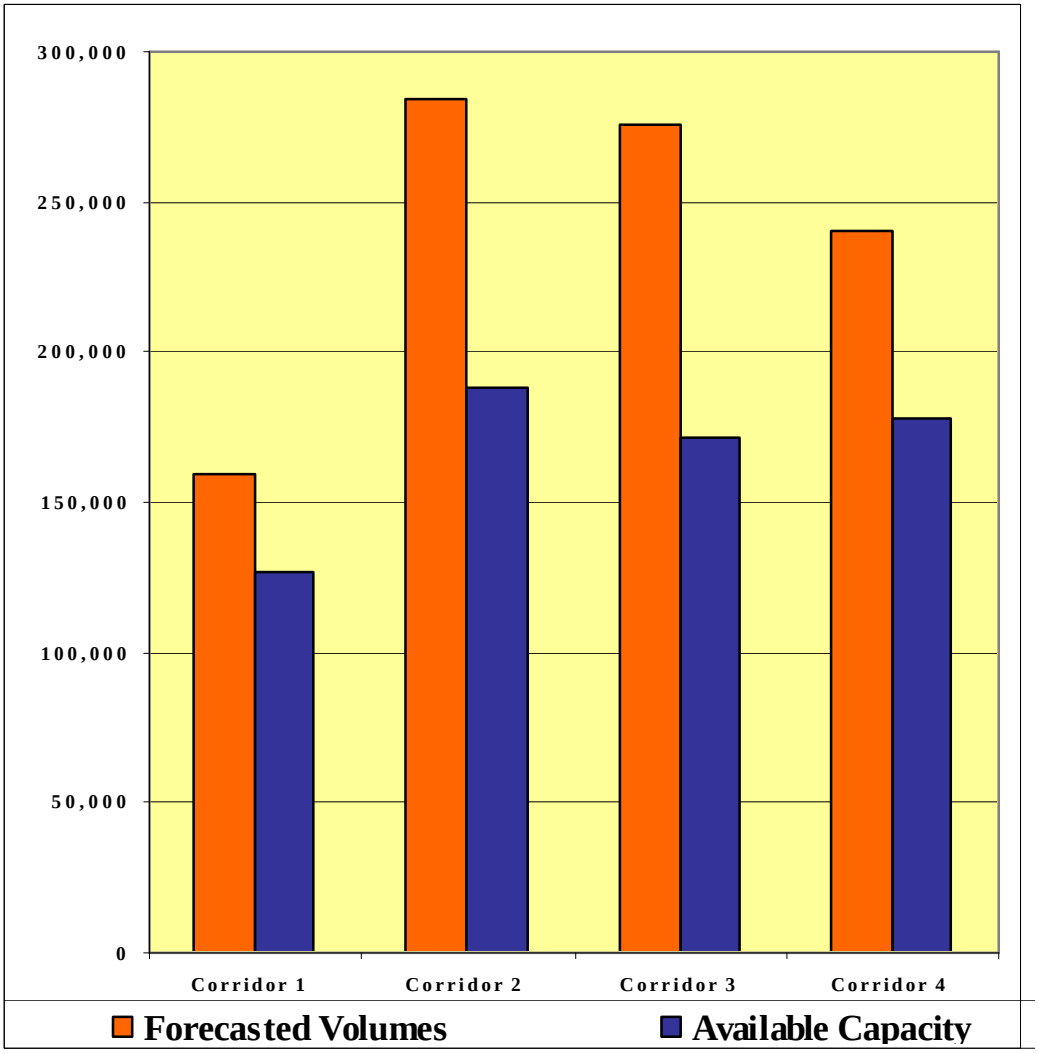


TABLE 21. TRAVEL DEMAND CORRIDOR ANALYSIS

	Corridor 1	Corridor 2	Corridor 3	Corridor 4	Overall
Forecasted Volumes	159,000	284,000	276,000	240,000	959,000
Available Capacity	127,000	188,000	171,000	178,000	664,000
Deficiency	-32,000	-96,000	-105,000	-62,000	-295,000
Percent Deficient	20.13%	33.80%	38.04%	25.83%	30.76%

FIGURE 37. DEMAND VS. SUPPLY



FUTURE MULTIMODAL CONDITIONS

This section examines future public transportation conditions based on the population and employment projections that have been developed for the 2030 horizon year. Future non-motorized conditions are also evaluated.

Future Public Transportation Conditions

Within any urban area, the origin and destination of most trips—and of the percentage of trips that will be made by use of public transportation—is related to where residents of the area live and where they work. Concentrations of population within an area suggest where commute trips are likely to originate during the morning peak travel period, and concentrations of employment function as "attractors" where such trips are likely to terminate. In the afternoon, the roles are reversed: Trips originate in areas where employment is concentrated and terminate in residential areas.

In order to analyze the forecasted concentrations of population (residential areas) and employment in Central Yavapai County, the population and employment levels were plotted by traffic analysis zone (TAZ) as shown in Figure 38. Note that each TAZ in Figure 38 reflects the sum of the population and employment within that TAZ. For example, for a TAZ with a population of 1,200 and employment of 800, a value of 2,000 was used. Note that Figure 38 does not include the entire study area, or the complete CYMPO region, but is, in effect, a "detail" of the portions of the region where population and employment are forecasted to be concentrated.

The value ranges for the "Persons per Square Mile" shown in Figure 38 were intentionally chosen to coincide with density thresholds for implementing various types of transit services as shown in Table 22. These threshold numbers have been used in a number of transit studies nationwide including the *High Capacity Transit Study* conducted in 2003 for the Maricopa Association of Governments. Note that the "bus-minimum service" category refers to standard fixed route bus services mostly operated in larger metropolitan areas. Deviated fixed route services and dial-a-ride services, such as the Cottonwood Area Transit Service operated in Cottonwood, sometimes operate in areas that do not meet the minimum density threshold of 4,500 persons per square mile, as do peak-hour commuter bus or van operations. Brief summaries of the different types of transit services and vehicles will be given in the following section.

While much of the area depicted in Figure 38 is forecasted to remain at low levels of population or employment density, the downtown areas of both Prescott and Prescott Valley are forecasted to exceed the density thresholds listed in Table 22. Also projected to exceed the thresholds are Prescott neighborhoods northwest and south of the town center, as well as an area southeast of downtown Prescott Valley and a narrow strip north of SR 89A. One area of Chino Valley bounded by SR 89, Road 2 North, Road 1 East, and Road 1 North is also projected to exceed the "Bus-Minimum Service" threshold.

FIGURE 38. 2030 COMBINED POPULATION AND EMPLOYMENT DENSITY IN CENTRAL CYMPO AREA

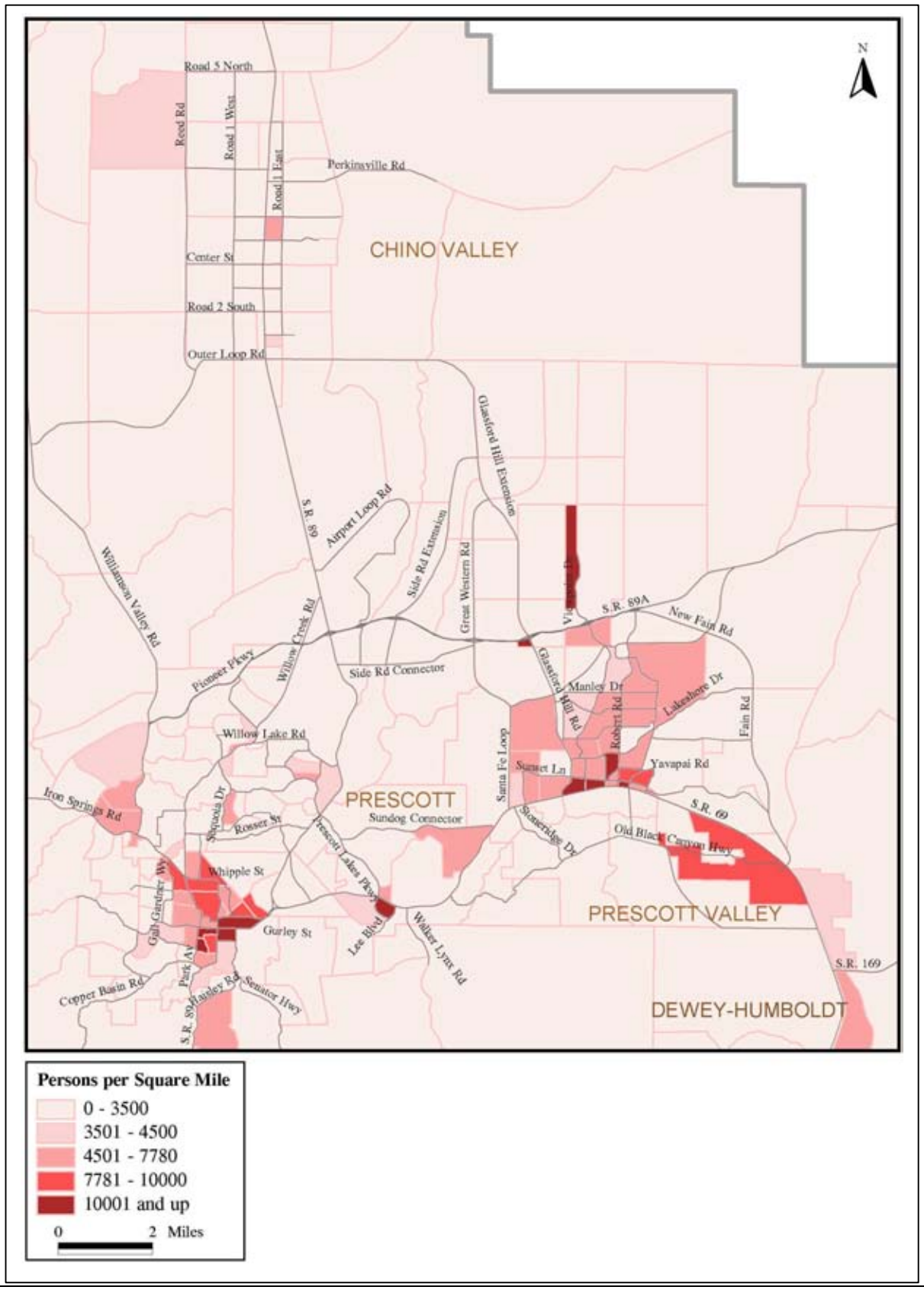


TABLE 22. MINIMUM CONSOLIDATED RESIDENTIAL AND EMPLOYMENT DENSITIES FOR VARIOUS TYPES OF TRANSIT SERVICES

Transit Service Type	Persons/Sq Mile*
Bus–minimum service	4,500
Bus–intermediate service	7,780
Light rail or Bus Rapid Transit	10,000

*Calculated from Maricopa Association of Governments *High Capacity Transit Study*, 2003
Bus minimum service = 1/2 mi between routes, 20 buses/day
Bus intermediate service = 1/2 mi between routes, 40 buses/day

A portion of Dewey-Humboldt south of SR 169 and east of SR 69 is projected to exceed the "Bus-Minimum Service" threshold. The "Bus-Intermediate Service" threshold is forecasted to be exceeded by most of downtown Prescott as well as portions east of downtown Prescott Valley. Small areas in downtown Prescott and Prescott Valley, together with an area between them on SR 69 west of Lee Boulevard, are projected to exceed the "Light Rail or Bus Rapid Transit" threshold.

Types of Transit Vehicles and Services

The types of transit service that may be in operation in Central Yavapai County by 2030 include dial-a-ride and paratransit services, deviated fixed route local circulators, and possibly bus rapid transit. Vehicles typically used for these services are shown in Figure 39.

Dial-a-Ride Service is a demand-response service. Vehicles do not operate on a fixed route or schedule, but pick-up patrons at their origins and deliver them directly to their destinations. Before the trip begins, and during the course of the trip, the driver receives information from a dispatcher concerning pick-up and drop-off requests.

The dispatcher and driver decide the most efficient order in which to make stops. Such a procedure often means that, after being picked up, a passenger must remain on board while "detours" to pick up or drop off other passengers are made. Hence, a dial-a-ride trip can take significantly longer to complete than if the passenger had been able to drive directly to his or her destination, and such service appeals primarily to transit-dependent persons.

Paratransit is complementary dial-a-ride service provided to seniors or disabled persons in a fixed-route service area as required by a provision of the Americans with Disabilities Act. ***Reserve-a-Ride*** is dial-a-ride service that requires that pick-up requests be made 24 hours in advance.

FIGURE 39. TYPES OF TRANSIT VEHICLES

Wheelchair-accessible vans are commonly used for both paratransit and dial-a-ride services, and may also be employed by vanpools that include mobility-limited participants.

—American Public Transit Association photo

—Lima & Associates photo

This "cutaway" vehicle, comprising a minibus body constructed on a recreational vehicle chassis, is used by Valley Metro for paratransit services. However, similar vehicles are typically used in both deviated fixed route and downtown or neighborhood circulator services.

Valley Metro's new "Rapid" buses feature amenities that make longer trips more comfortable such as forward-facing, reclining seats, individual reading lights, and overhead storage. Such vehicles could also be used for express, limited stop, or regional services.

—Lima & Associates photo

Deviated Fixed Route Service, sometimes referred to as "checkpoint" service, is considered an intermediate step between dial-a-ride, which targets transit dependent riders, and fixed route service, which is more efficient in larger cities having significant volumes of transit ridership.

A deviated fixed route stops at scheduled "time points"—or "checkpoints"—much as a fixed route service does. However, the route taken between points can vary from trip to trip. This

"connect-the-dots" approach offers the best of both worlds: passengers wishing to catch the bus at the last minute can wait at a time point; at the same time, the driver can receive a pick-up request from a dispatcher and "deviate" from the route accordingly. Hence, deviated fixed route trips can take longer than fixed route trips. At the same time, the service is more visible to the public than one that operates on strictly a demand-response basis.

Bus Rapid Transit (BRT) service operates at higher speeds and makes fewer stops than local buses, resulting in trip times that are more competitive with those of trips made in a private automobile. Bus rapid transit routes typically operate on freeways, in high-occupancy vehicle lanes, in lanes designated for bus use only, or on dedicated bus ways.

Some BRT operations are structured so that passengers purchase tickets prior to boarding, saving additional time.

Bus Rapid Transit routes are sometimes converted to light rail routes. The advantages and disadvantages of the two modes are compared in Table 23 below.

TABLE 23. COMPARISON OF LIGHT RAIL AND BUS RAPID TRANSIT

	Light Rail Transit	Bus Rapid Transit
Advantages	• Positive impact upon land use development within the corridor • Increased vehicle capacity	• Flexibility in operating and phasing • Ability to operate as short-term service
Disadvantages	• Limited ability for phased implementation • Higher capital investment cost than BRT	• Image of bus vehicles as slow • Reduced vehicle capacity

Source: Maricopa Association of Governments, *High Capacity Transit Study,* 2003

Transportation Demand Management Alternatives

Transportation Demand Management consists of a wide range of programs and services that enable people to get around without driving alone. Included are alternative transportation modes such as carpooling, vanpooling, transit, bicycling, and walking as well as programs that alleviate traffic and parking problems such as telecommuting, variable work hours, and parking management.

Transportation Demand Management can address the needs of those traveling long distances with rideshare options such as vanpools and carpools. These types of services are vital in moving people around large areas, whether for work or for traveling to regional centers that have special services, medical facilities, or retail stores.

Potential Sources of Transit Funding

Significant federal sources of funding grants are overseen and managed by the Federal Transit Administration (FTA); these funds are administered in Arizona by the Public Transportation Division of ADOT. FTA funding levels are part of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the successor to the Transportation Equity Act for the 21st Century (TEA-21). The federal transit laws are contained in Title 49 of the United States Code (USC), Chapter 53. The key transit grant provisions applicable to CYMPO are covered in the following sections of Chapter 53 of the USC:

- Section 5303: Metropolitan Transportation Planning
- Section 5307: Urbanized Area Formula Grants
- Section 5309: Capital Investment Grants and Loans
- Section 5310: Formula Grants and Loans for Special Needs of Elderly Individuals and Individuals with Disabilities
- Section 5313: State Planning and Research Programs

Other federal sources of funding include the Temporary Assistance for Needy Families Program, Title III Funds of the Older Americans Act, and Surface Transportation Program funds.

State Sources of Funding include the LTAF and LTAF II funds, which are also administered by ADOT's Public Transportation Division. Other sources of funding include farebox revenues, advertising and "in kind" revenues, local taxes or bonds, and the use of volunteers.

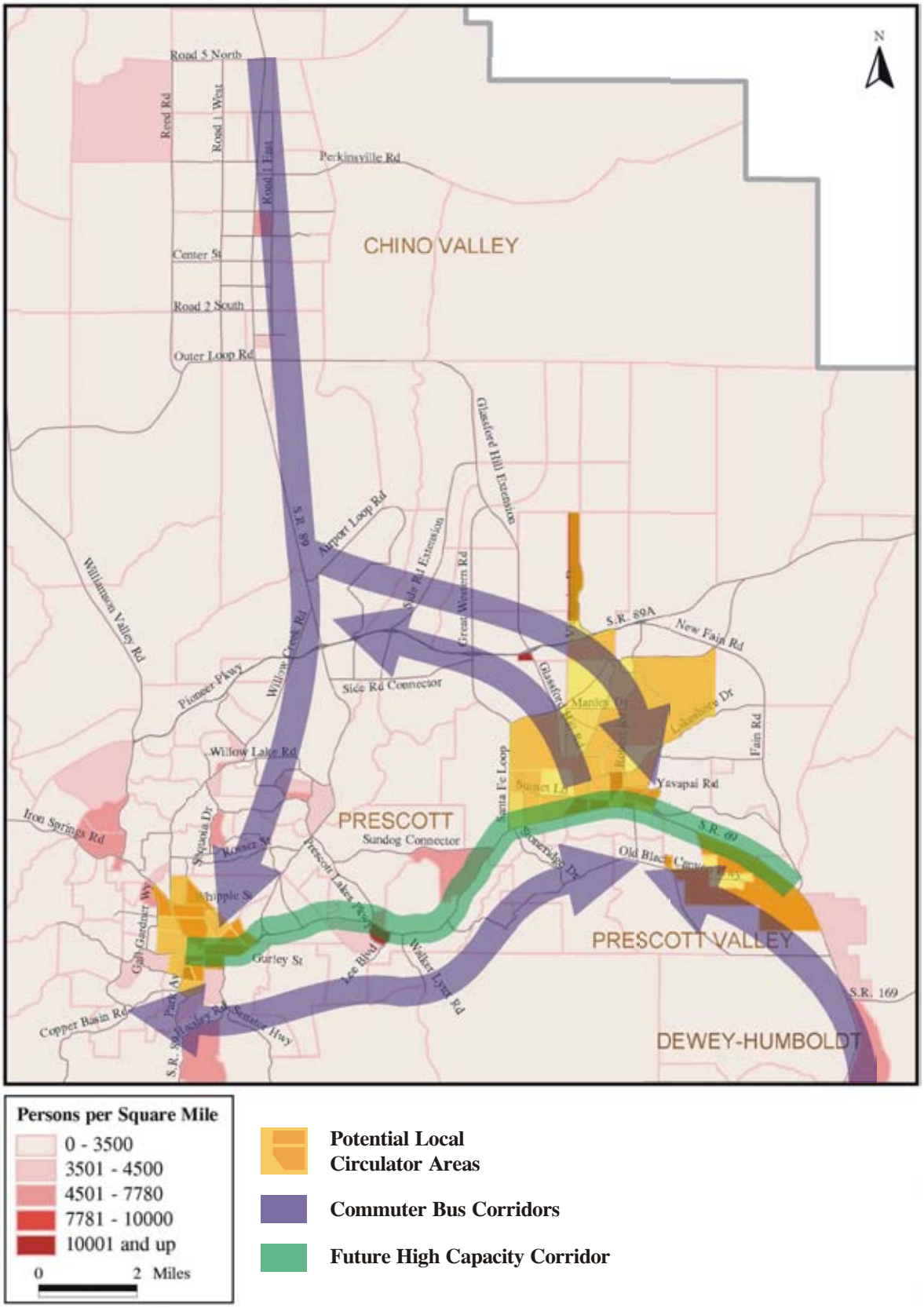
Potential Future Transit Service Needs

Figure 40 presents potential future transit services that may be needed in Central Yavapai County, based on the analysis of population and employment concentrations described above.

As the populations of Prescott and Prescott Valley increase, the most pressing unmet transit need is likely to be local circulator systems in both downtown areas, serving transit dependent persons including seniors, those too young to drive, those with disabilities that prevent them from driving, and those who cannot afford to own or operate a motor vehicle. In Prescott, the existing loop operated by the Prescott Transit Authority could be expanded as demand warrants, increasing the hours and frequency of service as well as the size of the service area. In Prescott Valley, a new local area circulator could be established. Such an operation could take the form of a fixed loop with supplemental paratransit service, like the Prescott Transit Authority Operation, or it could be implemented as a deviated fixed loop, avoiding the requirement for complementary paratransit.

A network of commuter bus routes—operated initially with vans—may be needed to link the three communities of Prescott, Prescott Valley, and Chino Valley at peak morning and afternoon travel services. Such services would enable transit-dependent persons who live in one community and work, attend school, shop, or seek medical or other assistance in another

FIGURE 40. POTENTIAL FUTURE CYMPO TRANSIT NEEDS



community to travel without relying on family members or neighbors for a ride. Commuter buses would also offer an alternative to increasingly stressful commuting by automobile at the peak travel times when the levels of service on the major arterials connecting the communities are likely to be at their worst.

By 2030, planning may be well under way for the future implementation of some sort of high capacity service along the SR 69 corridor between Prescott and Prescott Valley. This service could be either bus rapid transit, light rail, or a more exotic technology such as monorail that will have been perfected and appear feasible by then. In any event, the need to begin preserving future right-of-way for such a system may become self-evident soon, given the existing topographical and right-of-way constraints that exist in the corridor.

Implementing Future Transit Improvements

The private sector in Central Yavapai County has been particularly aggressive in taking an entrepreneurial approach to addressing perceived unmet local and regional transit needs in the area. A reasonable approach would be to build on and facilitate this tradition of entrepreneurship, rather than supplanting it with entirely different services.

That said, it is unreasonable to expect transit services, particularly local services, to be profitable enough to attract private sector investment and operation with no public support. The Prescott Transit Authority, for example, cross-subsidizes the operation of its local Prescott loop with revenues from its dial-a-ride and Phoenix airport trips. However, the firm may be unwilling to expand and improve the local loop service as needed—or even to continue operating it—without some assistance.

One of the key ways in which the public sector can initially assist private operations is by helping make their services more convenient and appealing. One or more transit transfer centers could be constructed where the various van and shuttle services could terminate and connect with one another. These could also be served by the local circulators and the commuter buses, facilitating the movement of persons throughout the region.

The specific planning and implementation steps to be taken should be addressed by a comprehensive transit feasibility and implementation study. Since this study is currently been conducted by the CYMPO, Its final recommendations will take precedence.

Future Non-Motorized Conditions

Yavapai County and the local jurisdictions in Central Yavapai County have adopted plans for enhancing and extending the area's already comprehensive system of paths and trails. These plans include:

- ADOT Statewide Bicycle and Pedestrian Plan

- Yavapai County General Plan
- Yavapai County Master Trails Plan
- 2003 Prescott Bicycle and Pedestrian Master Plan
- 1999 Willow Lake South Area Plan
- 1998 Prescott East Area Plan
- 1997 Willow Creek Road Corridor Study and Land Use Plan
- 2002 Prescott Valley General Plan 2020
- 2003 Town of Chino Valley General Plan

As Central Yavapai County becomes more urbanized, preservation of the County's paths and trails will be critical, as well as preserving the continuity of the system where it exists and filling in the missing links.

The construction of new roadways and by-passes in the area must consider the needs of pedestrian, equestrian, and bicycle traffic, and provisions for safe—ideally grade-separated—crossings of major arterial roadways should be planned. In some instances, such crossings could also serve as wildlife crossings.

Cross-sections of new roadways should also provide for non-motorized corridors that are both safe and pleasant for the user. Central Yavapai County's mild, four season climate and scenic vistas encourage non-motorized travel for work- and school-related as well as recreational purposes. As expansions to the transportation network are designed, the encouragement and facilitation of non-motorized travel should be taken into consideration.

The need for carrying bicycles on transit vehicles should be evaluated.

Figures 41 and 42 present the existing and proposed sidewalk and trail facilities for the City of Prescott. These figures demonstrate the significant amount of planning that has already taken place with respect to non-motorized transportation. Proposed trails, for example, include a loop trail around Willow Lake, as well as a trail along the north side of SR 89A from the airport area to the east.

New developments need to include parks that are accessible from the trail system as well as internal trail networks that connect with the regional trails.

FIGURE 41. PRESCOTT SIDEWALK AND TRAIL FACILITIES – NORTH REGION

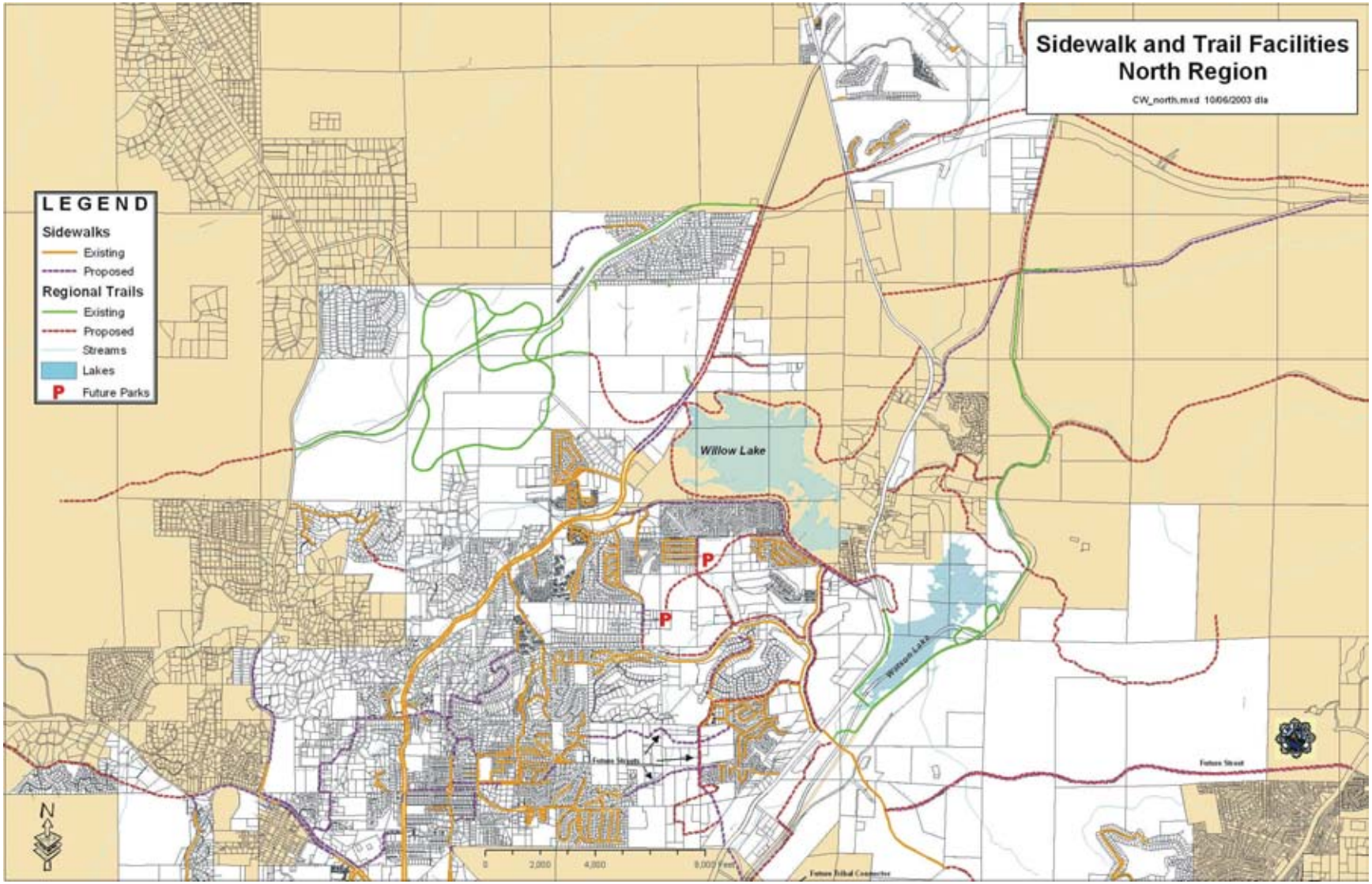
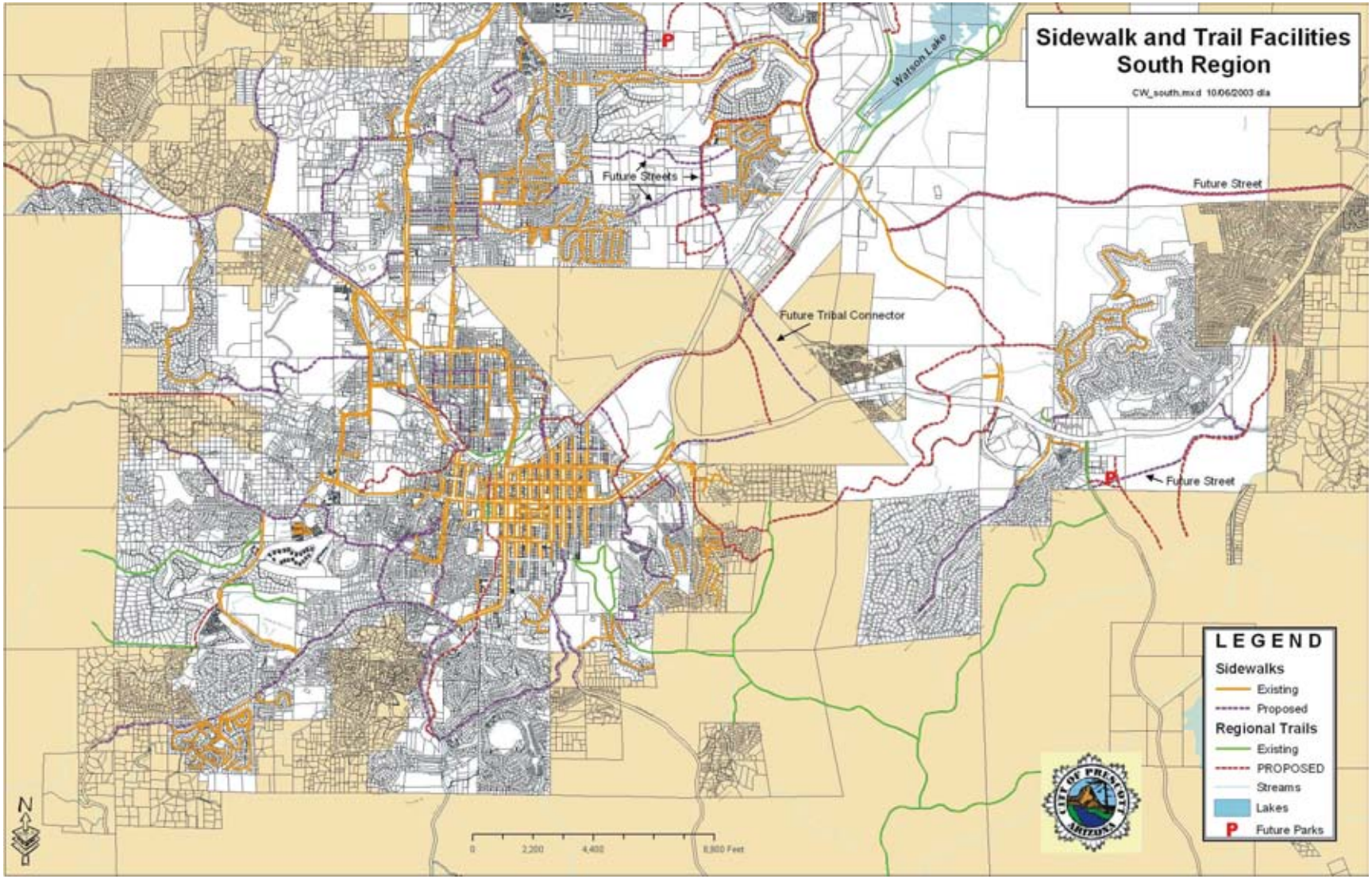


FIGURE 42. PRESCOTT SIDEWALK AND TRAIL FACILITIES – SOUTH REGION



4. TRANSPORTATION PLAN AND PROGRAM

This chapter presents the development of the recommended long-range transportation regional system and the corresponding transportation improvement program for the CYMPO area. The results of the analysis of the committed and planned facilities and other alternative scenarios are presented in detail. In addition, a summary of findings and recommended improvements is included. Funding sources and strategies are presented as a guide for funding the recommended facilities. Implementation and access management guidelines are also included in this section of the final report.

ANALYSIS OF ALTERNATIVES

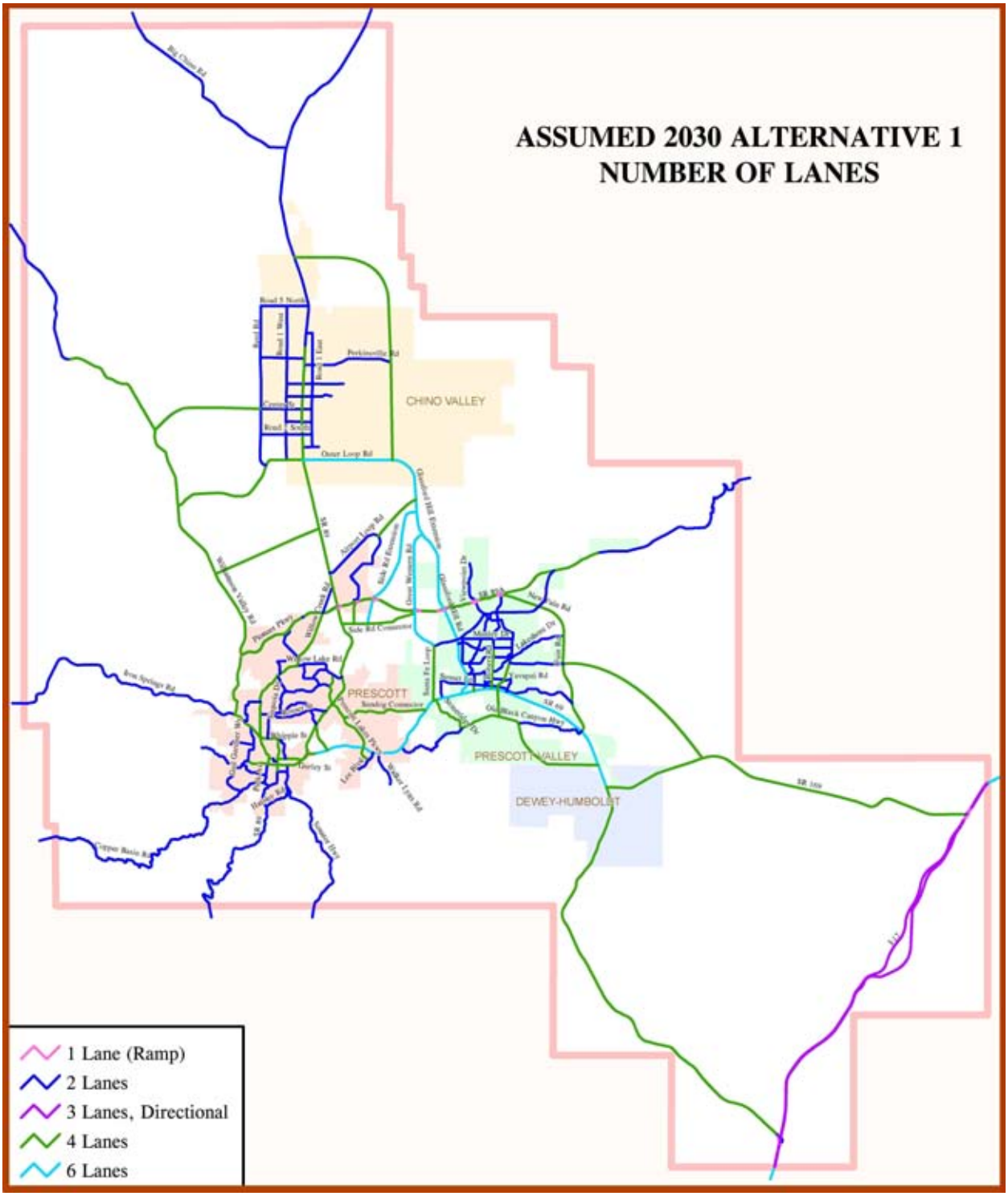
Based on the deficiencies identified in the previous chapter, additional improvements to existing facilities as well as to future planned improvement corridors were identified. Input was taken by jurisdictional comments and from public comments and suggestions voiced during the first open house. Two types of networks emerged: alternative networks and test networks. The major difference between the two sets is the consideration of topographical constraints and economic impacts with the former set and no considerations of this nature for the latter set. All alternatives include a reduction of trips to account for the presence of operational multimodal infrastructures in the CYMPO study area for the 2030 horizon year. CYMPO is currently conducting a transit feasibility study, which will provide directions in the development of the multimodal system. In the absence of current local transit data, conservative trip reduction estimates were used from similar jurisdictions to account for future multimodal facilities. However, as new data for the region becomes available, it will be incorporated in the future Transportation Study updates, which must be conducted every five years or sooner if needed.

Alternative Networks

2030 Alternative 1. used the 2030 base network with the following additional improvements (see Figure 43), as suggested by the party shown:

- Widen Glassford Hill Rd to six lanes from SR 69 to SR 89A (2018 Plan)
- Construct Glassford Hill extension from Outer Loop to Road 7 northeast of SR 89 (ADOT)
- Extend Perkinsville Rd to the Glassford Hill Extension (public and jurisdictional comment)
- Improve Country Club Bypass and Old Black Canyon Hwy to four lanes to Stoneridge as an alternate route to SR 69 (public comments and ADOT)
- Improve SR 169 to four lanes from I-17 to SR 69 (ADOT)

FIGURE 43. 2030 ALTERNATIVE NETWORK 1



- Construct SR 89 as a four lane bifurcated roadway through the Granite Dell area (ADOT)
- Construct new four lane road – From Williamson Valley (WV) Rd to Center Rd (public comment)
- Construct new four lane road – From Williamson Valley Rd to SR 89 and continuing to Glassford Hill Extension south of Outer Loop (public comments)
- Construct new four lane limited access facility from SR 169 to Superstition Rd in Prescott Valley (jurisdictional comment)
- Construct new four lane roadway connecting Airport Loop Rd to the Glassford Hills Extension (MPO comment)

2030 Alternative 2. used alternative 1 as a base with the following improvements, see Figure 44:

- New limited access facility from I-17 to SR 169 to SR 89A – four lanes (ADOT)
- Improve Tonto Rd from Williamson Valley Rd to Iron Springs Rd - two lanes (public comment)

Test Networks

The development of test networks was primarily to ascertain the effects of some suggested improvements and to address public concerns. Two scenarios were formulated: the SR 69 re-route test and the high capacity test. For these scenarios, no consideration was given to major natural constraints or economic impacts.

SR 69 Re-route Test. The base for this test was the Alternative 1 network with the following improvements, see Figure 45:

- Construction of 4 lanes limited access facility located south of existing SR 69 linking SR 69 at SR 169 to SR 89 in Prescott, with limited connections to SR 69 through its entirety

High Capacity Test. The base for this test was the Alternative 1 network. The main purpose for this alternative was to quantify the amount of capacity needed to address 2030 travel demand. The major routes in the regional system, SR 89A, SR 89, and SR 69, were given ample capacity to accommodate future traffic. Figure 46 depicts the lane configuration for this test.

FIGURE 44. 2030 ALTERNATIVE NETWORK 2

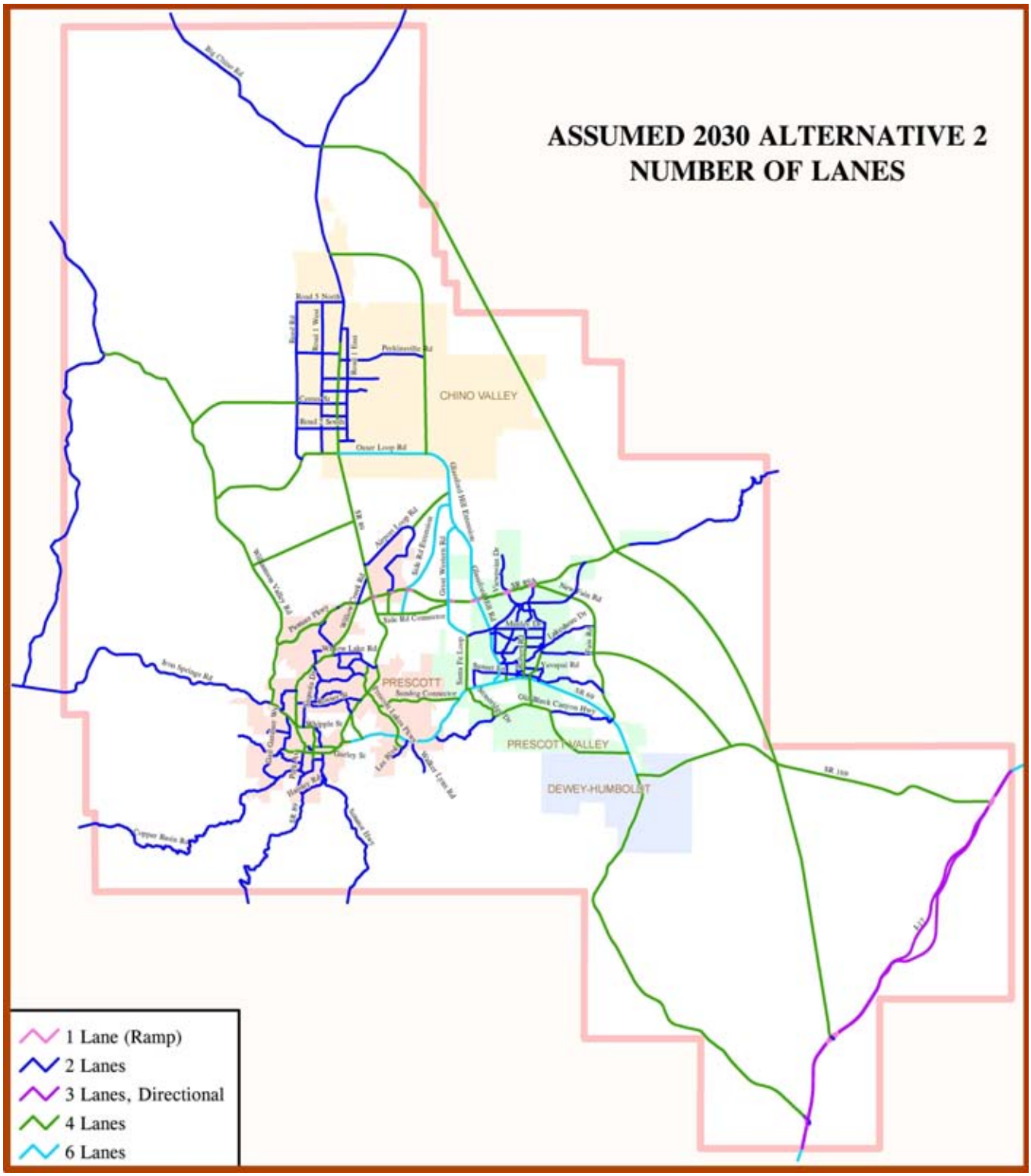


FIGURE 45. ASSUMED 2030 BY-PASS TEST – NUMBER OF LANES

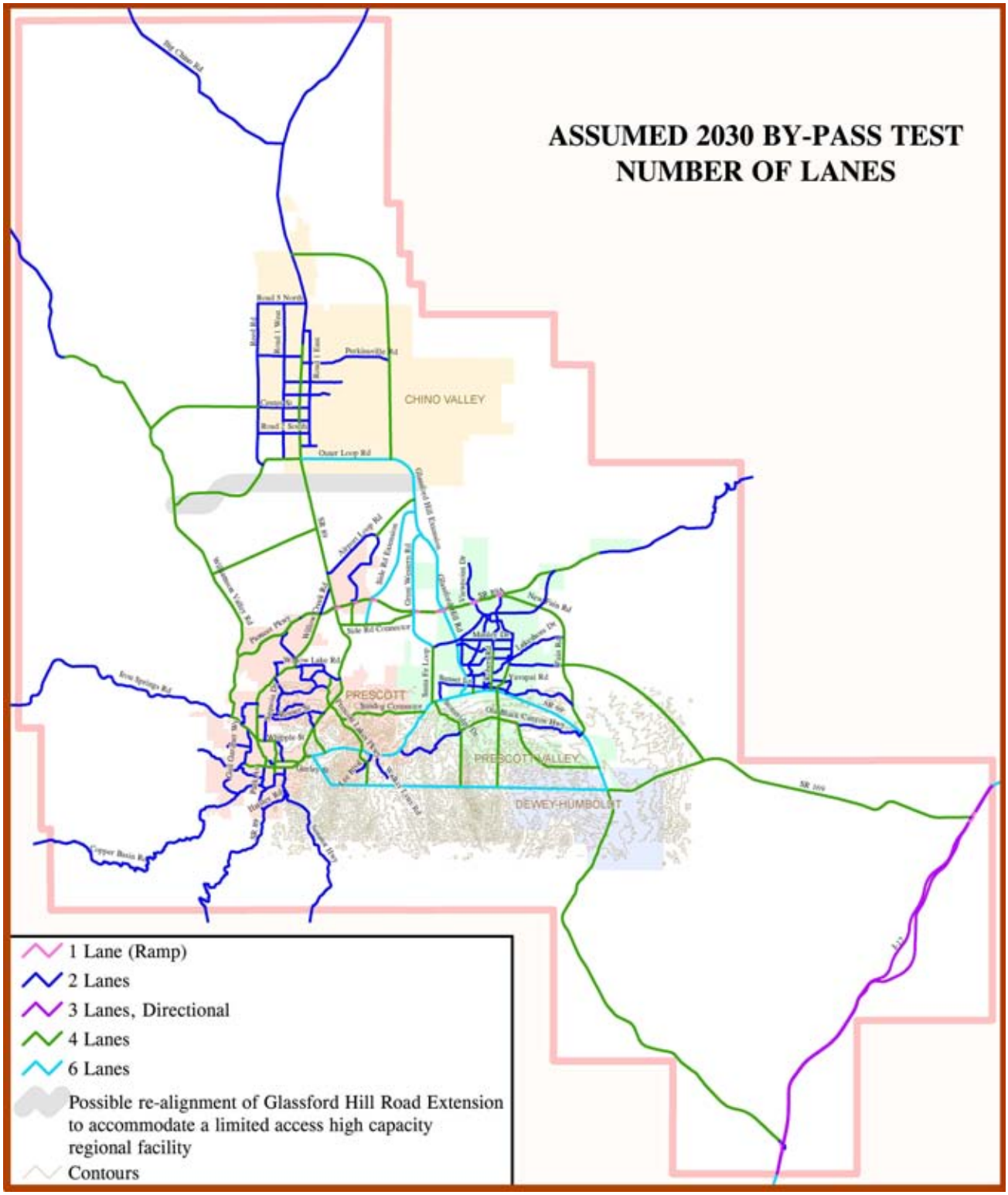
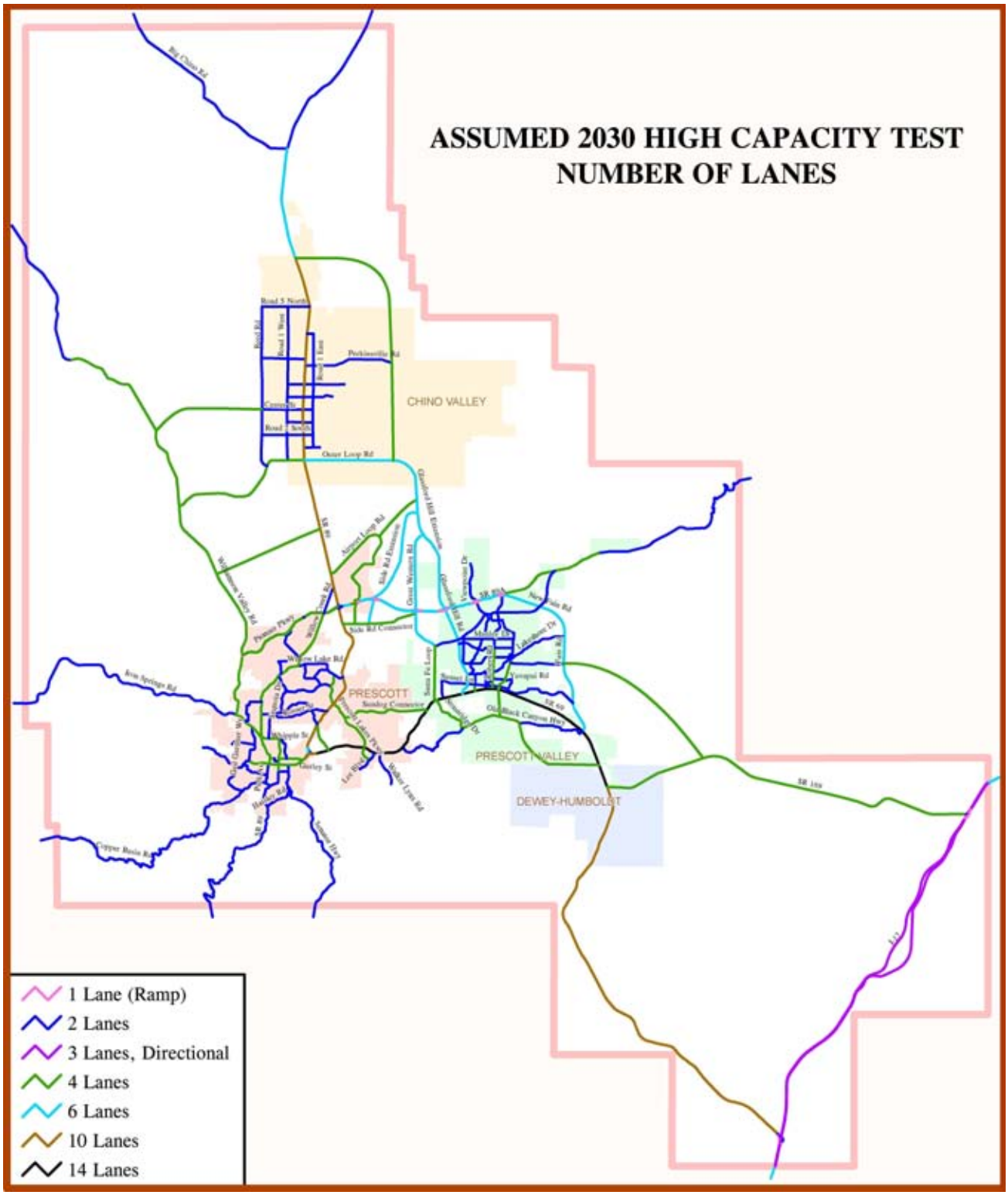


FIGURE 46. ASSUMED 2030 HIGH-CAPACITY TEST – NUMBER OF LANES



Evaluation of Improvements Scenarios

To evaluate the performance of each roadway scenario, a demand–supply analysis on the four corridors was conducted and compared to the 2030 Base results. Figures 47 and 48 display the outcome, which can be summarized as follows:

- Alternative 1 decreases the gap between demand and supply and although traffic volume on the major regional facilities has decreased, they are still congested.
- Alternative 2 aids in the overall relief of some major arterials, but not to the point of moderate congestion. However, these corridors must be preserved for future studies and additional analysis.
- SR 69 Re-route Test brings some relief to SR 69; however, further studies are needed to determine its full impact. Land use distribution and connections to SR 69 will produce varying results. Additional considerations are the topographical constrains in the area.
- High Capacity Test depicts the level of improvements necessary to meet most of the travel demand on the regional roadways, if the land use in the CYMPO area is developed as described in the currently adopted jurisdictional general land use plans. Economical and fiscal constraints are major obstacles.

FIGURE 47. CORRIDOR ANALYSIS OF NETWORK ALTERNATIVES 1 AND 2

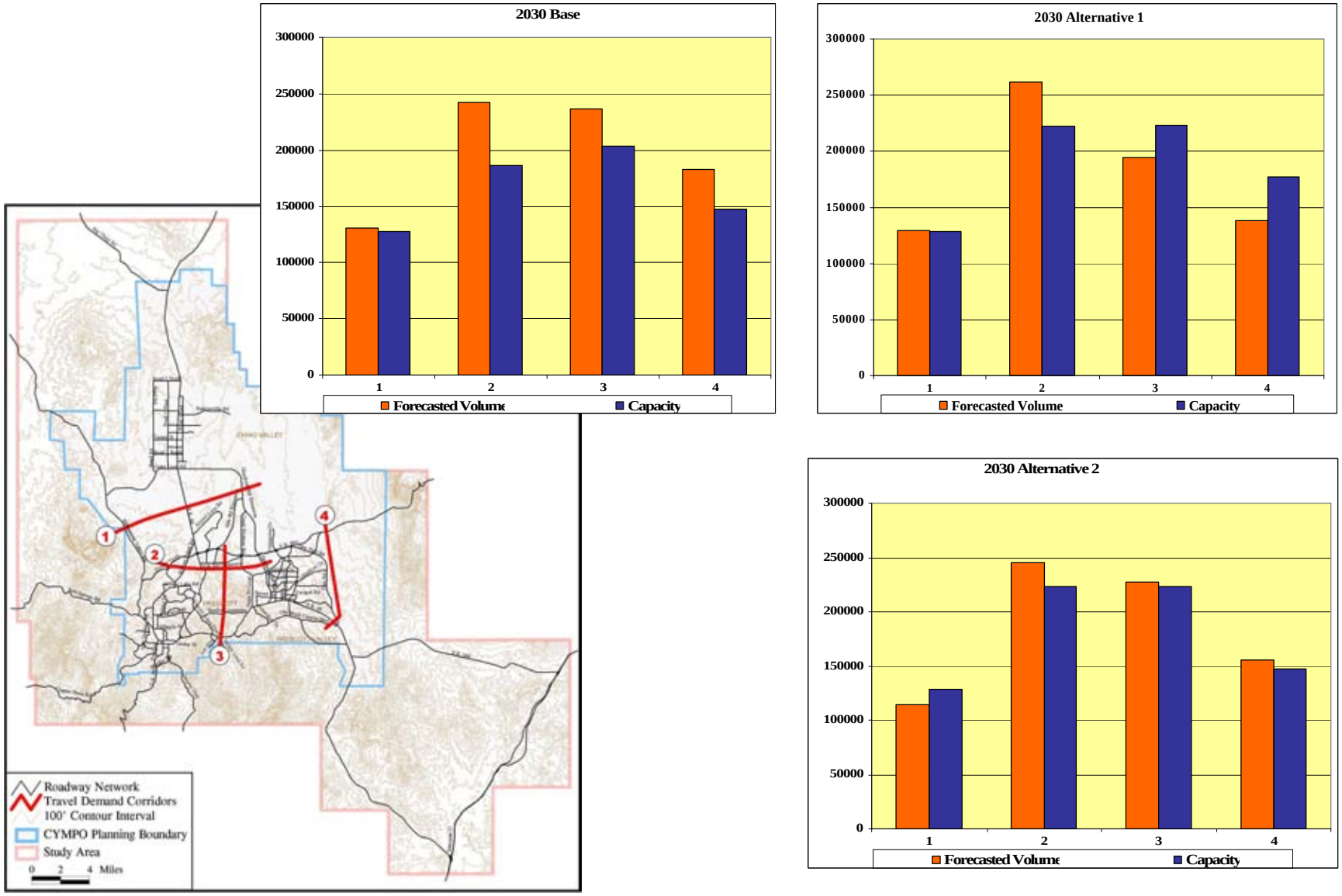
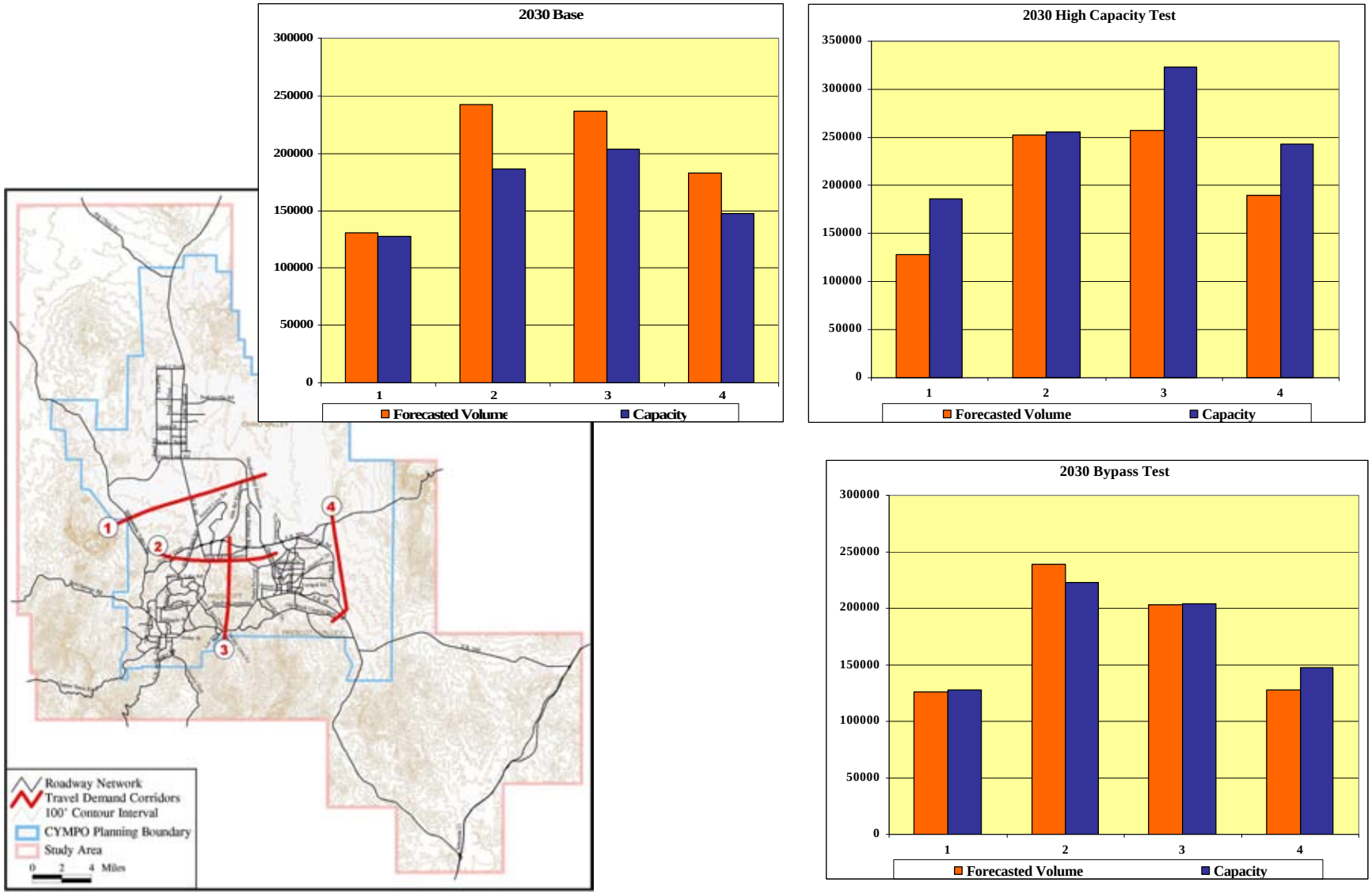


FIGURE 48. CORRIDOR ANALYSIS OF BY-PASS AND HIGH-CAPACITY TESTS



THE CYMPO 2030 PROPOSED REGIONAL SYSTEM PLAN

The network alternatives were presented to the public during the second set of open houses. Comments and suggestions were collected and tabulated for formulation of the regional system plan. Figure 49 depicts the 2030 regional system for currently adopted general land use plans of the CYMPO member agencies. Table 24 lists the improvements by category. Figures 50 and 51 display the level of service and forecasted traffic volumes for the horizon year 2030 with the regional system. The development timeframe of the multimodal infrastructure could impact the performance of the system at corridor levels.

Table 25 and Figure 52 provide a snap shot of the effects of the new system improvements on the regional transportation system. The first attest to the redistribution of traffic among the future roadway system, while the second displays the increase in average daily travel speed thus enhancing mobility.

Roadway Network

The 2030 regional system includes all the improvements presented in Alternative 1 with provisions to further study elements from Alternative 2 and the SR 69 Re-route Test. The Glassford Hill Road Extension from SR 89A to SR 89 to Williamson Valley Road provides the opportunity for a controlled access facility to offer some relief to SR 89 in the same area. The Plan also suggests an area study to determine the most appropriate way to widen SR 89 in the vicinity of the Granite Dells. Major interchanges on SR 89A will be constructed at SR 89, currently in progress, Side Road, Great Western Road, Viewpoint Drive and Robert Road/Fain Road. On Fain Road interchanges will be constructed at Santa Fe Loop, Superstition Drive, and Valley Road. Other possible interchanges could occur along Glassford Hill Road Extension and the Chino By-Pass, if the road is developed as a controlled access facility. The facilities detailed engineering study will determine the location and configuration of the interchanges.

This plan addresses concerns outside of the CYMPO planning boundary, but within the study area, which greatly affects the roadway system in the CYMPO planning area. Such concerns are the corridor preservation for the Eastern Corridor, strongly supported by all jurisdictions within the study area. Further studies are needed to evaluate the feasibility of the SR 69 Re-route as a viable strategy.

FIGURE 49. 2030 CYMPO PROPOSED REGIONAL SYSTEM

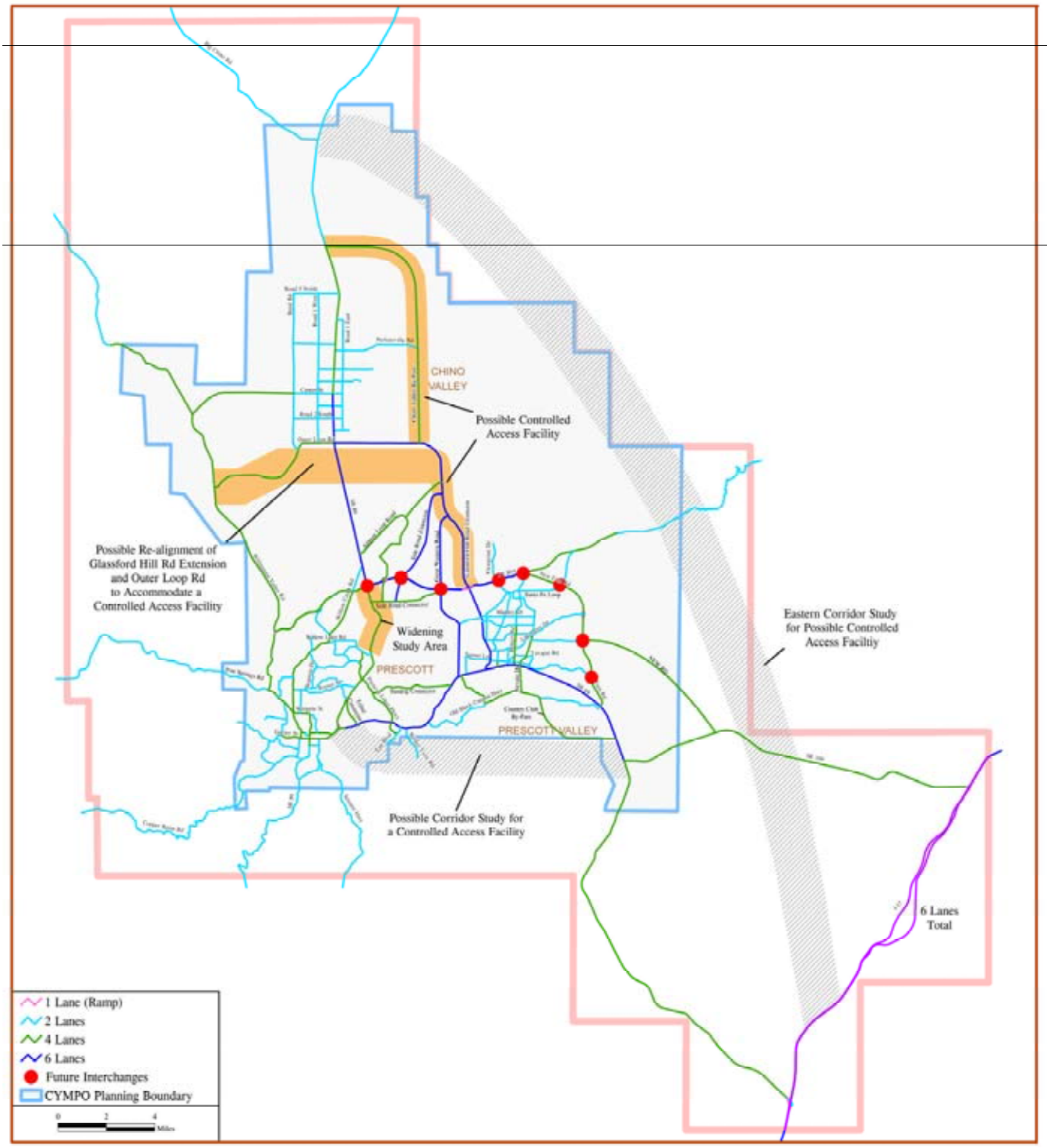


TABLE 24. PROPOSED 2030 ROADWAY IMPROVEMENTS

Limited/Controlled Access Roads Six Lanes (new or improved))

- Construct Glassford Hill Road Extension from SR 89A to Outer Loop Road or other alignment to be determined
- Widen Glassford Hill Road from SR 69 to SR 89A
- Construct Side Road
- Construct Great Western Boulevard
- Widen SR 89A from SR 89 to Robert Road
- Widen SR 69 from SR 169 to SR 89
- Widen SR 89 from Center Street to SR 89A

Proposed Four-Lane Roadway Facilities (new or improved)

- Construct Chino Valley By-Pass from Glassford Hill Extension to Road 7 North east of SR 89
- Construct Sundog Connector
- Construct Tribal Connector
- Widen Fain Road from SR 69 to SR 89A (Controlled Access Facility)
- Widen Williamson Valley Road from Iron Springs to Hootenanny Holler
- Widen SR 89 from Road 3 North to Road 7 North
- Widen SR 89 from SR 89A to SR 69 ; detailed analysis will be required to determine feasibility/accessibility within the Granite Dell area
- Widen Outer Loop Road
- Construct Side Road Connector
- Build Country Club By-Pass
- Widen Old Black Canyon Highway from Country Club By-Pass to Stoneridge
- Construct a new road from Williamson Valley Road to Center Street (final location to be determined)
- Construct new roadway connecting Airport Loop Road to the Glassford Hill Road Extension
- Construct new limited access facility from SR 169 to Lakeshore Drive in Prescott Valley
- Widen SR 169 from I-17 to SR 69
- Construct Navajo Drive from SR 69 to Old Black Canyon Highway
- Construct/Widen Airport Loop Road

Proposed Two lanes Roadway Facilities (new or improved)

- Construct Santa Fe Loop
- Construct Viewpoint Drive
- Connect Perkinsville Road to the Chino Valley Bypass

Proposed Transit Service Scenario

- Local Circulators in the City of Prescott, Town of Prescott Valley and the Town of Dewey-Humboldt
- Commuter bus service between the major jurisdictions in the Tri-City area
- High Capacity Corridor opportunities along SR 69

Proposed Traffic Interchanges

- SR89 & SR89A
- SR 89A & Side Road
- SR 89A & Great Western Blvd
- SR 89A & Viewpoint Drive
- SR 89A & Robert Road
- Fain Road & Santa Fe Loop
- Fain Road & Superstition Drive
- Fain Road & Valley Road

FIGURE 50. 2030 PROPOSED REGIONAL SYSTEM NETWORK LOS AND DAILY TRAFFIC VOLUMES

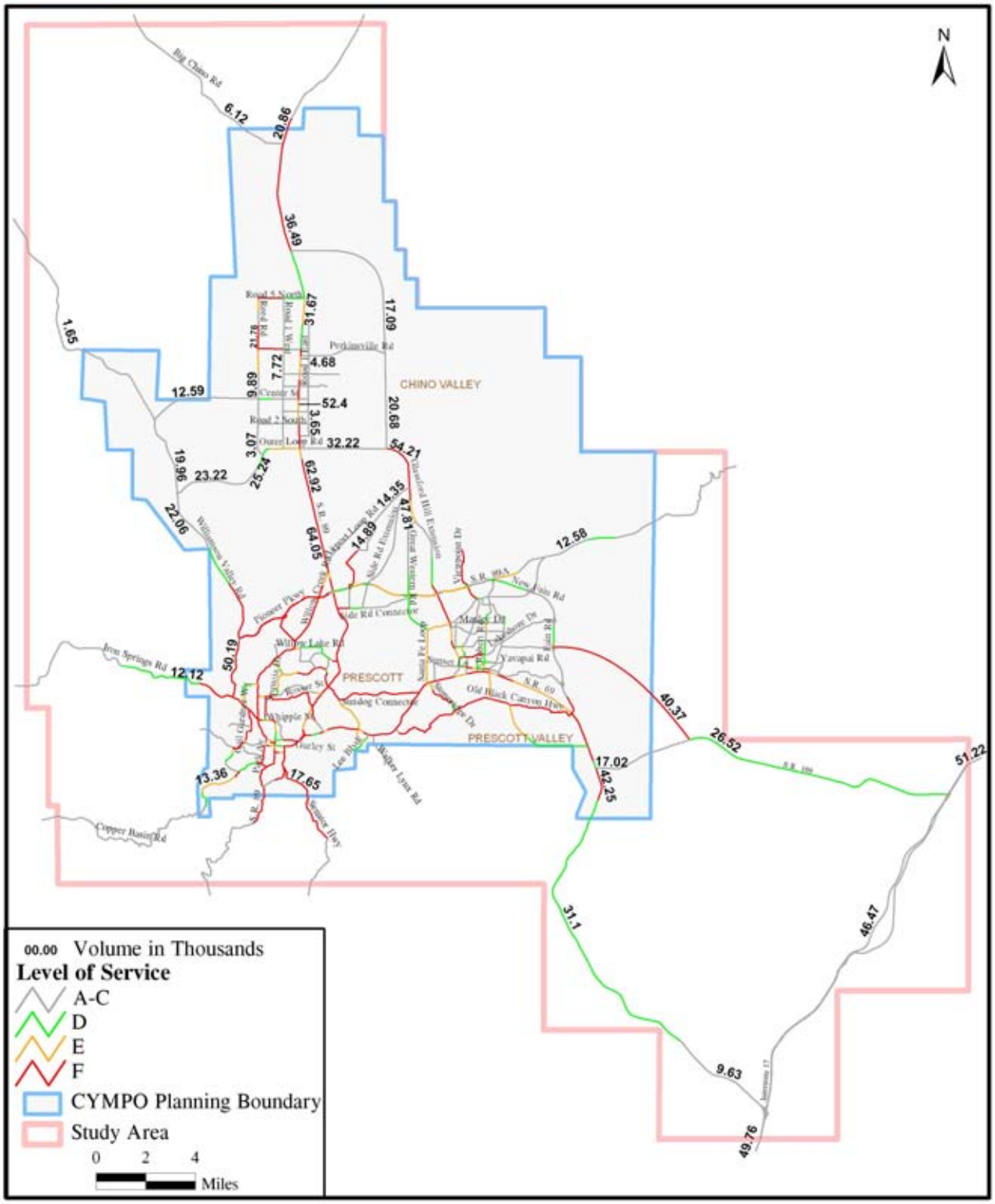


FIGURE 51. 2030 PROPOSED REGIONAL SYSTEM NETWORK LOS AND DAILY TRAFFIC VOLUMES (INSET)

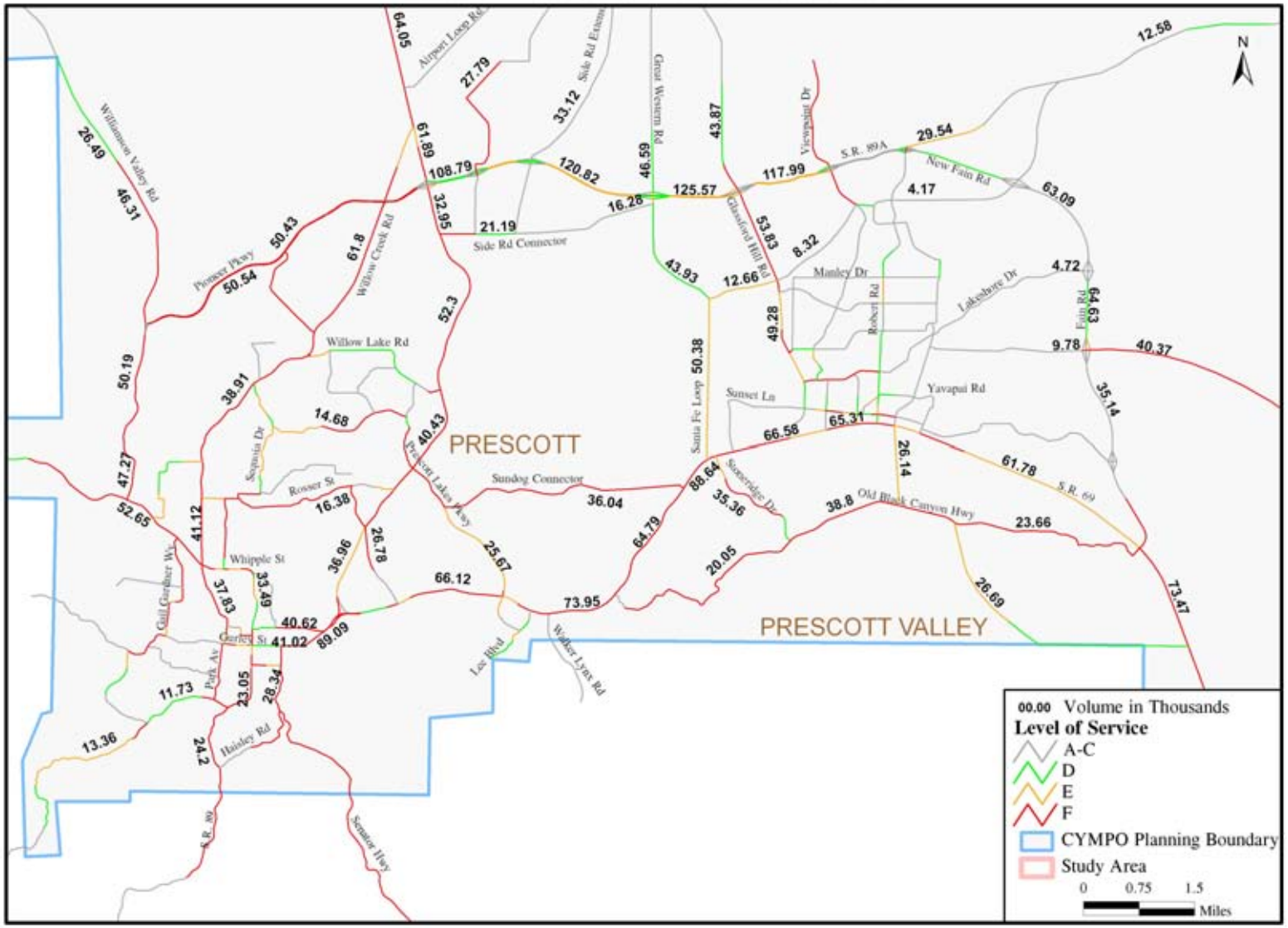
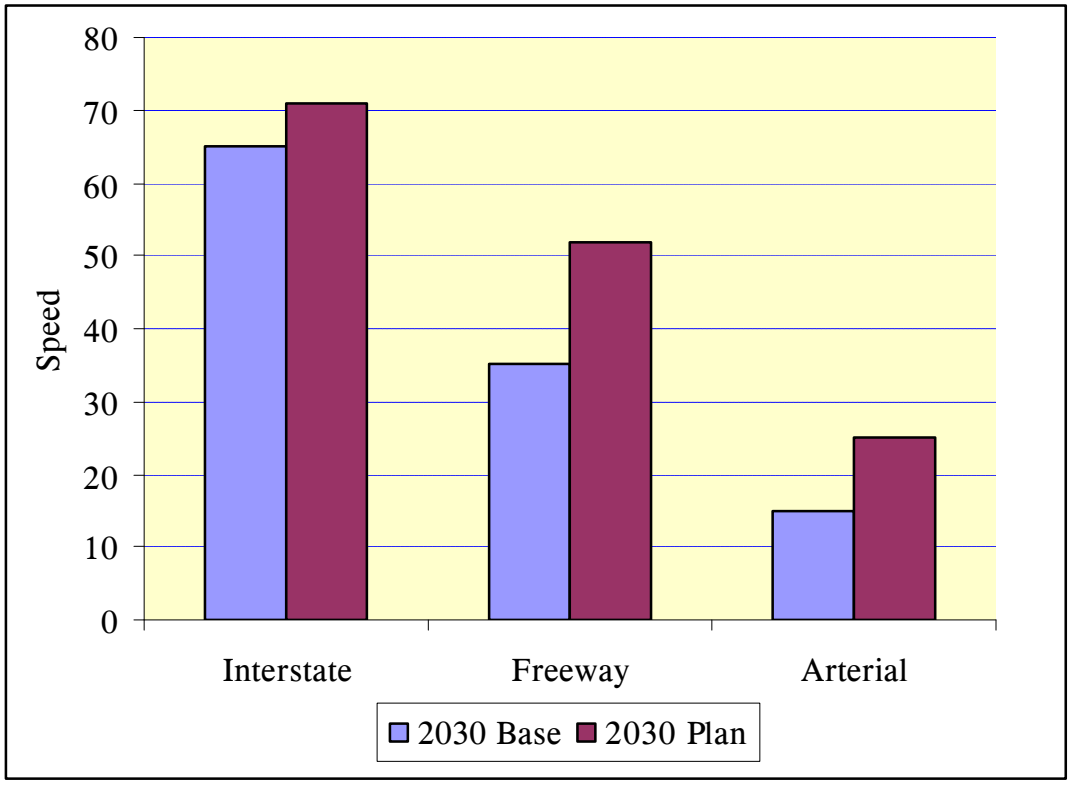


TABLE 25. COMPARISON OF DAILY TRAFFIC VOLUMES

Roadway	Where	2030 Base	2030 System
SR 89	South of Outer Loop	48,200	62,900
SR 89	North of SR 69	37,200	37,000
SR 89A	East of Larry Caldwell	104,400	119,600
SR 89A	East of Glassford Hill Road	98,000	118,000
SR 69	South of SR 169	111,100	73,500
SR 69	West of Glassford Hill Road	75,300	66,600
SR 69	Near Lee Boulevard	85,100	79,100
Pioneer Parkway	East of Commerce Drive	52,000	50,400
Fain Road	South of Lakeshore Drive	41,900	64,600
Willow Creek Road	South of Willow Lake Road	47,200	46,200
Glassford Hill Road	South of SR 89 A	40,500	54,200
Glassford Hill Road Ext.	East of Outer Loop Road	53,200	32,200
Williamson Valley Road	North of Pioneer Parkway	62,200	46,800
Prescott Lake Parkway	South of SR 89	50,300	41,800

FIGURE 52. COMPARISON OF AVERAGE TRAVEL SPEEDS (MPH)



Transit Services

Alternative modes of transportation are increasingly important in the CYMPO area to help alleviate traffic congestion as the region grows. By the 2030 horizon year, portions of Central Yavapai County are estimated to exceed density thresholds used for implementing some types of public transportation.

The cursory analysis performed as a part of this Small Area Transportation Study strongly supports the future need for transit services that assist in addressing both local and regional travel needs. Future CYMPO transit service may include dial-a-ride and paratransit services, deviated fixed route local circulators, and bus rapid transit, together with ride-sharing programs. It is also important to include transit centers where the various transit and shuttle services could connect with one another for increased mobility.

It is important that the CYMPO Transit Study currently being conducted provide a comprehensive vision for the multimodal component of the CYMPO Transportation Plan. Identification of future local transit service areas and regional corridors is needed, together with the steps necessary to implement the system when demographics and travel volumes warrant.

Non-motorized Modes

As Central Yavapai County becomes more urbanized, preservation of the Region's paths and trails will be critical—preserving the continuity of the system where it exists and filling in the missing links.

New roadway construction in the Region must consider the needs of pedestrian, equestrian, and bicycle traffic, and provisions for safe—ideally grade-separated—crossings of major arterial roadways should be planned for. In some instances, such crossings could also serve as wildlife crossings.

Cross-sections of new roadways should also provide for non-motorized corridors that are both safe and pleasant for the user. Central Yavapai County's mild, four season climate and scenic vistas encourage non-motorized travel for work- and school-related as well as recreational purposes. As expansions to the transportation network are designed, the encouragement and facilitation of non-motorized travel should be taken into consideration.

The need for carrying bicycles on transit vehicles should be evaluated.

TRANSPORTATION IMPROVEMENT PROGRAM

The improvement program for implementing the recommended transportation plan is designed to offer guidelines on the phasing of design, reconstruction, and new construction of roadways, and general recommendations for transit and non motorized modes. The planning unit costs, in 2006 dollars, are presented in Table 26 and could be used to estimate costs of improvements. An improvement program for implementing the recommended plan is presented in Table 27. These unit cost estimates are preliminary and are for planning and programming purposes only.

The cost of performing environmental and archeological surveys and cost for the purchase of right-of-way is not included in the unit cost estimates unless otherwise specified.

TABLE 26. PLANNING UNIT COSTS

Item	Cost (2006 Dollars)
Design and construct two additional freeway lanes	$4,000,000/mi
Design and construct interchange	$10,000,000 ea
Design and widen a county or municipal roadway from two to four lane (level terrain)	$3,000,000/mi
Design and widen a county or municipal roadway from two to four lane (rolling terrain)	$5,000,000/mi
Design, grade, and pave a City roadway with curb, gutter, and sidewalk	$1,500,000 – 3,000,000/mi
Bridge widening from two to four lanes	$3,000,000 ea

For all new proposed roadways, the following steps should be taken to identify specific alignments:

- Prepare a design concept report to establish line and grade of the facility, identify the right-of-way, and estimate costs.
- Work with property owners, State Land, and the U.S. Forest Service to acquire right-of-way where necessary.
- Reserve right-of way for the ultimate facility.

A very preliminary cost estimate in 2006 dollars for implementing the 2030 Regional System Plan is approximately 1.2 billion dollars. This estimate is exclusive of right-of-way costs. The estimate assumes the roadway alignments depicted in Figure 49. Funds are currently available for implementing some of the short term (2006-2011) projects.

TABLE 27. IMPROVEMENT PROGRAM

Facility	FY 2006-2011	FY 2012-2020	FY 2021-2030
State Route 69 (ADOT)	Design to six lanes from SR 169 to SR 89. ADOT Request for project scoping	Construct from SR 169 to SR 89 as a six lane facility	
SR 69/SR 89 Interchange (ADOT)	Construct TI		
State Route 89 A (ADOT)	Construct TI at Viewpoint Drive Construct TI at Side Road Design and construct TI at Robert Road	Design and construct TI at Fain Rd Design to six lanes from SR 89 to Fain Rd	
SR 89A/SR 89 Interchange (ADOT)	Construct TI		
State Route 89A (ADOT)		Design and right-of-way acquisition for four lanes from Fain Rd to milepost 329.	Construct four lanes from Fain Rd to milepost 329
State Route 89 (ADOT)	Design and acquire right-of-way for 6 lanes. Widen to four-lanes from SR 89A to milepost 324.3 (Phase II)	Perform capacity enhancement alternative study for SR 89 in the Granite Dells area	Design and widen to four lanes from milepost 314 to SR 89A
State Route 89 (ADOT)	Reconstruct as four-lane roadway from milepost 324.3 to Center Street (Phase I)		Widen to six lanes from SR 89A to Center Street. Design to a four lane facility from Road 3 north to Road 7 north
State Route 169 (ADOT)		Design to a four-lane facility	Construct the facility
I-17 (ADOT)		Design to a six-lane facility from Cordes Junction to SR 169	Construct to a six-lane facility from Cordes Junction to SR 169
Fain Road (Yavapai County)	Design and construct to a four lane controlled access facility with interchanges as needed		
Glassford Hill Road Extension (Yavapai County)	Study to determine the feasibility of a controlled access facility from SR 89A to SR 89 to Williamson Valley road Design and right-of-way acquisition for the entire corridor	Construct facility from SR 89A to SR 89	Construct facility from SR 89 to Williamson Valley Road
Glassford Hill Road (Prescott Valley)		Design to a six-lane facility and construct from SR 69 to SR 89A	
Great Western Blvd (Prescott)		Design and right-of-way acquisition from SR 69 to Glassford Hill Extension Construct from SR 69 to SR 89A	Construct the facility from SR 89A to Glassford Hill Extension
Williamson Valley Rd (Yavapai County)	Widen to four lanes from Pioneer Pkwy to Iron Springs Road. Widen to four lanes from Pioneer Pkwy to Outer Loop Road	Design, right-of-way acquisition, and widen to four lanes from Outer Loop to Hootenanny Holler	
Tribal Connector (Yavapai Apache Nation)	Design and construct a four-lane facility		

Note: The listed agency in the "Facility" column is the possible lead agency, not the responsible implementation agency.

TABLE 27. IMPROVEMENT PROGRAM (Continued)

Facility	2006-2011	2012-2020	2021-2030
Side Road Extension (Prescott)	Design and construct Phase I from SR 89A northerly (terminus to be determined)	Design and construct Phase II to Great Western Blvd	Construct facility
Side Road (Prescott)	Design and construct 6 lanes from SR 89A to Side Road Connector		
Side Road Connector (Prescott)	Design and construct 4 lanes Phase I (terminus to be determined)	Design and construct 4 lanes Phase II (limits to be determined)	
Sundog Connector (Prescott)	Right-of-way acquisition from SR 69 to Prescott Lakes Pkwy	Design and construct	
New Facility from SR 169 to Lakeshore Drive (Prescott Valley)	Perform feasibility study the determine roadway alignment	Design, right-of-way acquisition, and construct the facility	
Chino Valley Bypass (Chino Valley)		Design and right-of-way acquisition from Glassford Hill Extension to Road 7 North	Construct facility and connect to Perkinsville Road
New Facility from Williamson Valley Rd to Center Street (or location to be determined) (Yavapai County)		Design and right-of-way acquisition	Construct facility
County Club Bypass (Prescott Valley)		Design to a four-lane facility and right-of way acquisition	Construct facility
Navajo Drive (Prescott Valley)		Design concept and location study from SR 69 to Old Black Canyon Highway	Acquire right-of-way and construct two-lane roadway
Airport Loop Road (Prescott)	Design and right-of-way acquisition for a four-lane facility	Construct facility	
Santa Fe Loop (Prescott Valley)		Design and right-of-way acquisition	Construct facility
Viewpoint Drive (Prescott Valley)		Design and construct the remaining portion of Viewpoint Drive	
Old Black Canyon Highway (Prescott Valley)		Design and right-of-way acquisition for a four-lane facility from County Club Bypass to Stoneridge	Construct facility
Outer Loop Road (Yavapai County)		Design, right-of-way acquisition, and widen to four lanes, if the Glassford Hill Road Extension to Williamson Valley Road is not feasible	
Corridor Studies		Perform study to evaluate the feasibility of the Eastern Corridor and the SR 69 Bypass Corridor	
Transit	Consider recommendations from the CYMPO Transit Feasibility Study		
Trail & Bicycle Paths	Make provisions for safe crossing of major arterial	Cross-sections of new major roadways should also provide for non-motorized corridors	

Note: The listed agency in the "Facility" column is the possible lead agency, not the responsible implementation agency.

REVENUE SOURCES AND FUNDING STRATEGIES

CYMPO and member agencies have a number of Federal, State, and local funding sources to finance improvements to the roadway system. Funding options include both traditional and innovative sources. Traditional sources are the Arizona Highways User Revenue Fund (HURF), the Local Transportation Assistance Fund (LTAF), Federal-Aid Funds (Surface Transportation, Bridge, Safety, Rail, and Transportation Enhancement Funds), and local general funds such as general obligation bonds and revenue bonds. Alternative sources of funding include special assessment districts, developer dedications and exactions such as impact fees. Table 28 depicts CYMPO funding totals for FY 2007-2011.

TABLE 28. CYMPO FEDERAL AND STATE FUNDED PROJECTS FUNDING TOTALS FY 2007-2011

Agency	III.	FY 2007-2011
Federal		$ 27,000,000.00
State		$ 20,700,000.00
CYMPO		$ 2,906,000.00
Local Jurisdictions		$ 1,434,00000
Total		$ 52,036,000.00

Additional locally funded projects in the CYMPO area totals $103,694,013.00 for fiscal years 2007-2011.

FEDERAL-AID TRANSPORTATION FUNDS

The Federal-aid Highway Program (FAHP) is financed from the proceeds of motor fuel and other highway related excise taxes deposited in the Federal Highway Trust Fund (HTF). The Federal-aid Highway Program is a federally assisted, state administered program, which distributes Federal funds to the states for the construction and improvement of urban and rural highway systems. On Federal-aid highway projects, a state (or local entity qualified for certification acceptance through the state) develops the plans, administers the contracts, and supervises the construction. The highways remain under the administrative control of the state or local government responsible for their operation and maintenance.

Using revenues in the Highway Account of the Highway Trust Fund, the Federal Highway Administration (FHWA) reimburses states for expenditures related to approved highway projects. The FHWA distributes these revenues to states based on apportionment and allocation criteria. Authorization is the process by which Congress authorizes the expenditure of Federal revenues on Federal programs. In recent years, the authorization has been for a six-year period. The most recent Highway Transportation Act, Safe, Accountable, Flexible,

Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), was signed into law by the President on August 10, 2005, and extends the FAHP through September 30, 2009. For each Federal fiscal year, the FHWA apportions the authorized funding among the states according to formulas that are established in authorizing statutes. Apportionment factors includes: lane-miles, vehicle miles traveled, taxes paid into the HTF, diesel fuel usage, etc. The distribution of Federal funds that do not have a statutory formula is called an "allocation" rather than an "apportionment".

Table 29 and Table 30 summarize the federal transportation highway and transit funds by eligible uses by program type respectively.

TABLE 29. FEDERAL TRANSPORTATION FUNDING IN ARIZONA

ADOT Funding Program	Program	Eligible Uses	Federal Share of Funded Projects
AC	Advance Construction	Allows states to independently raise upfront capital required for a project and preserve eligibility for future federal funding for the project. Projects must be designated as advance construction projects to be eligible.	Dependent on funding source.
BR	Bridge Replacement and Rehabilitation	Replacement and rehabilitation of any public bridge. Up to 50 percent of Bridge Program apportionments may be transferred to NHS, I/M, STP, and/or CMAQ. Funds set aside for bridges not on federal-aid highways (off-system bridges) may not be transferred unless a determination is made that the state has inadequate needs to justify expenditure of the full amount of the funds set aside.	80%
CBI	Coordinated Border Infrastructure	Discretionary grant program for planning, project development, construction and operation of projects that serve border regions near Mexico and Canada and high priority corridors throughout the United States. Border States and MPOs are, under the CBI program, eligible for discretionary grants for: Transportation and safety infrastructure improvements, operation and regulatory improvements, and coordination and safety inspection improvements in a border region.	80% subject to the sliding scale adjustment

TABLE 29. FEDERAL TRANSPORTATION FUNDING IN ARIZONA (Continued)

ADOT Funding Program	Program	Eligible Uses	Federal Share of Funded Projects
CM	Congestion Mitigation and Air Quality (CMAQ)	A wide range of projects in air quality nonattainment and maintenance areas for ozone, carbon monoxide, and small particulate matter, which reduce transportation-related emissions. States may transfer up to 50 percent of the amount by which the CMAQ apportionment for the fiscal year exceeds the amount that would have been apportioned for that fiscal year had the CMAQ program been funded at $1.35 billion annually to STP, NHS, I/M and/or Bridge Replacement/Rehabilitation. Transferred funds may only be used in nonattainment and maintenance areas.	80%
ER	Emergency Repair	Aid for Federal, State, and local highways with unusually heavy repair expenses due to serious damage from natural disasters or catastrophic from an external cause.	100% if accomplished in first 180 days after disaster occurs; or at pro rata share that would normally apply to the Federal-aid facility damaged.
EB	Equity Bonus	The Equity Bonus Program has three features: one tied to Highway Trust Fund contributions and two independent. First, the Equity Bonus Program ensures that each State's return on its share of contributions to the Highway Trust Fund ranges from at least 90.5 percent in 2005 to 92 percent in 2009. Second, each State is guaranteed a specified rate of growth over its average annual TEA-21 funding level. Third, States meeting certain conditions set in SAFETEA-LU (for example, a median household income of less than $35,000) are guaranteed a share of apportionments and High-Priority Projects not less than the State's average share under TEA-21.	The Federal share is generally 80 percent, subject to the sliding scale adjustment.

TABLE 29. FEDERAL TRANSPORTATION FUNDING IN ARIZONA (Continued)

ADOT Funding Program	Program	Eligible Uses	Federal Share of Funded Projects
FLH	Federal Land Highway	Funding for a coordinated program of public roads and transit facilities serving Federal and Indian lands. A new program category for refuge roads (RR) was added to FHLP. [1115(e)] This program provides funds that may be used by the U.S. Fish and Wildlife Service and the FHWA for the maintenance and improvement of Federally owned public roads that provide access to or within a unit of the National Wildlife Refuge System.	Uses State/local share for Federal-Aid Highway funded projects (IM, NHS, STP, CMAQ).
HES	Safety	10% of STP funds are set-a-side for safety construction activities (hazard elimination and rail-highway crossings) for state and local projects.	Uses State/local share for Federal-Aid Highway funded projects (IM, NHS, STP, CMAQ).
IM	Interstate Maintenance	Resurfacing, restoring, and rehabilitating routes on the interstate highway system, but no new capacity except HOV or auxiliary lanes in nonattainment areas. States may transfer up to 50 percent of I/M apportionments to NHS, STP, CMAQ, and/or Bridge Replacement/Rehabilitation	90% (80% for added capacity in attainment areas).
ITS	Intelligent Transportation Systems Research	The program provides for the research, development, and operational testing necessary to develop and deploy advanced technology to improve the safety and performance of the Nation's surface transportation systems. The program encourages public/private partnerships and private sector investment.	100%
NHS	National Highway System	Interstate routes, major urban and rural arterials, connectors to major intermodal facilities, national defense network. Fifty percent of NHS funds can be freely flexed to STP, IM, CMAQ or Bridge; 100% with USDOT approval and public comment.	80%
NRT	National Recreation Trails	Recreational Trails Program provides funds to States to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. Each State administers its own program, usually through a State resource or park agency.	

TABLE 29. FEDERAL TRANSPORTATION FUNDING IN ARIZONA (Continued)

ADOT Funding Program	Program	Eligible Uses	Federal Share of Funded Projects
SB	Scenic Byways S	National Scenic Byways created in 1991 to preserve and share unique places, and at the same time, help promote tourism and benefit economic development. Grant component is for projects on state and nationally designated byways.	80%
SRTSP	Safe Routes to School Program	Program can be used for the planning, design, and construction of projects that will substantially improve the ability of students to walk and bicycle to school. These include sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, secure bike parking, and traffic diversion improvements in the vicinity of schools (within approximately 2 miles).	State must set aside not less than 10 percent and not more than 30 percent of the funds for non-infrastructure-related activities to encourage walking and bicycling to school.
STP	Surface Transportation Program	Broad range of surface transportation capital needs, including many roads, transit, sea, and airport access, vanpool, bike, and pedestrian facilities. Suballocations of STP include Transportation Enhancements, Safety funds, and suballocations to metropolitan areas over 200,000 in population.	80% unless modified due to calculations of federal land (in Arizona typically 94.3%).
TEA	Transportation Enhancements	Funded through a 10% set aside from Surface Transportation Program funds for project that enhance surface transportation activities by going above and beyond what transportation departments typically do. Eligible for pedestrian and bicycle facilities, safety and educational activities for pedestrians and bicyclists, acquisition of scenic easements or historic sites, scenic highway programs including Tourist and Welcome Center facilities, landscaping and other scenic beautification, historic preservation of transportation facilities, rehabilitation of historic transportation facilities, preservation of abandoned railway corridors (including conversion to trails), control and removal of outdoor advertising, archeological planning and research, environmental mitigation to address water pollution from highway runoff or to reduce vehicle-caused wildlife mortality, and establishment of transportation museums.	Same as for STP

TABLE 30. FEDERAL TRANSIT ADMINISTRATION URBAN-RELATED PROGRAMS

Program	Eligible Uses	Federal Share of Funded Projects / Services
Section 5303 Urbanized Areas 50,000-200,000	Planning assistance for intermodal transportation and technical studies.	80%
Section 5307 Urbanized Areas 50,000-200,000	Capital and operating expenditures.	80% (90% for incremental costs of vehicle-related equipment to comply with CAAA and ADA).
Section 5307 Urbanized Areas Over 200,000	Capital and preventive maintenance; 1% must go to transit enhancements.	80% (90% for incremental costs of vehicle-related equipment to comply with CAAA and ADA).
Section 5308 Clean Fuels (Set-aside before allocation to areas)	Purchase/lease of clean fuel buses and facilities; improvements to existing facilities to accommodate clean fuel vehicles.	80%
Section 5038 Over-the-Road Bus Accessibility (Rural Transportation Accessibility Incentive Program)	Eligible Capital Projects include adding lifts and other accessory components. Eligible training costs include developing training materials or providing training.	90%
Section 5309 Capital Investment Grants and Loans	New starts or extensions to existing fixed guideway systems (40%); comply with CAAA and ADA; fixed guideway modernization (40%); bus and related facilities (20%).	80% (90% for incremental costs of vehicle-related equipment).
Section 5310 Special Needs of the Elderly / Individuals with Disabilities	Capital assistance to organizations providing specialized services for the elderly and disabled.	80% (90% for incremental costs of vehicle-related equipment to comply with CAAA and ADA).
Section 5310 Job Access and Reverse Commute Grants (JARC)	Capital and operating costs of job; access transportation services. Promotion of special services/programs.	50%
Section 5311 Other than Urbanized Areas (under 50,000)	Capital and operating expenditures in non-urbanized areas.	80% (90% for incremental costs of vehicle-related equipment to comply with CAAA and ADA).

Arizona has been allocated a total of $1.879 billion between 2006 and 2008. The estimated funding levels for Arizona are summarized in Table 31 for Fiscal Years 2005-2006, 2006-2007, and 2007-2008. The distribution of these apportionments to Metropolitan Planning Organizations (MPOs) is also shown.

TABLE 31. ESTIMATED FEDERAL AID HIGHWAY APPORTIONMENTS AND ALLOCATION FOR ARIZONA (In Millions of Dollars)

Description	Estimated Apportionments		
	FY 05-06	**FY 06-07**	**FY 07-08**
Apportionments			
Surface Transportation	178.7	167.1	171.9
National Highway System	142.3	147.4	152.0
Interstate Maintenance	$130.2	$134.9	$139.1
Bridge Replacement and Rehabilitation	19.4	20.1	20.7
Congestion Air Quality	43.7	45.3	46.7
Recreational Trails	1.3	1.6	1.7
Highway Planning and Research	10.5	10.5	10.5
Metropolitan Planning	5.7	5.7	5.8
Border Infrastructure Program	7.1	8.1	9.3
Safe Routes to School	1.6	2.1	2.6
Equity Bonus	54.4	87.2	93.9
Subtotal	**$594.9**	**$630.0**	**$654.2**
Apportionment Distribution by Entity			
MAG	111.3	117.8	122.3
PAG	20.8	22.1	22.9
ADOT	428.9	454.2	471.7
Optional Use by MAG, PAG, Other Locals	21.4	22.7	23.6
Other Locals	12.5	13.2	13.7
Subtotal	**$594.9**	**$630.0**	**$654.2**
Grand Total FY 06 - 08			**$1,879.1**

Source: Arizona Department of Transportation, *State Transportation Improvement Plan,* 2006 – 2008
Feb 2006, Portion of State Transportation Funds are flexed to FTA for Transit projects Statewide.

STATE AND OTHER TRANSPORTATION FUNDS

Arizona Highway User Revenue Fund

Monies from the Highway User Revenue Fund (HURF) are intended for the improvement of the State's highways and bridges. Once collected, the HURF revenues are distributed to ADOT, and in turn distributed as an entitlement share to cities, towns, and counties in proportion to population and to the Economic Strength Project Fund. HURF distributions may be used as debt service for revenue bond projects. The principal sources (see Table 32) of revenue include:

- Gasoline Taxes. Arizona's motor vehicle fuel tax of 18 cents per gallon is the largest source of revenue for HURF.
- Use Fuel Taxes. Use fuel taxes are taxes on diesel fuel and range between 18 cents per gallon for passenger cars to 26 cents per gallon for commercial trucks and buses. These taxes provide the third largest source of revenue.
- Motor Carrier Fees. These fees, based on the weight of the vehicle, are the smallest source of funding for HURF.
- Vehicle License Taxes (VLT). Vehicle license taxes are linked to the value of the vehicle being taxed and are the second largest source of funds for HURF. These VLT funds are the only one of the four major HURF revenue sources that are tied to inflation and increase as vehicle prices increase. In recent years, the VLT tax rate has been reduced to be more in line with that of neighboring states.
- Other fees include: motor vehicle registration fees, border crossing fees, and other miscellaneous fees.

TABLE 32. FY 2006 ADOT REVENUE SOURCES - STATE
(In Millions of Dollars)

Description	FY-06 Actual
Gasoline Tax	$489.1
Use Fuel Tax	213.5
Motor Carrier Fee	40.5
Vehicle License Tax	373.9
Registration	158.7
Other	55.9
Total	**$1,331.6**

Source: Arizona Department of Transportation, Financial Management Services, August, 2006

The HURF is the primary source for state highway funding and HURF funds are limited to highway use by the Arizona Constitution.

Local Transportation Assistance Fund (LTAF)

The LTAF is funded by the Arizona Lottery for use by cities and towns requesting the funds. The LTAF funds are allocated in proportion to the relative population of all Arizona cities and towns. Each requesting municipality is guaranteed a minimum of ten thousand dollars. Currently, $23 million may be deposited in the LTAF from the State lottery fund each fiscal year. Cities and towns with a population of more than 300,000 persons must use LTAF funds for public transportation. In addition, up to 10 percent of funds may be used for the arts, or for disabled and handicapped assistance.

In 2000, the Arizona Legislature enacted the LTAF II program, with revenues derived from the Arizona's share of the multi-state Powerball lottery. These funds are apportioned in a manner similar to LTAF funds, except that any jurisdictions receiving more than $2,500 in LTAF II funds are required to use all of the funds received for transit-related purposes including provision of local matching funds for FTA programs, operating funds, and transit planning. However, Powerball revenues have fluctuated widely and LTAF II has not proved to be a stable source of funding for operations.

Public Transit

The Federal Government funds transit capital and operating assistance programs for systems in designated urban areas. CYMPO serves as conduits for this funding to local operators. However, larger cities including Phoenix and Tempe receive their funding directly. Two federal public transit programs administered by ADOT primarily fund Arizona's small urban and rural transit services. One is the Section 5311 program for general public service in rural areas. The other transit program is the Section 5310 program which funds vehicles for organizations providing specialized transportation services for the elderly or disabled.

Additional sources of revenue available for transit services include the following:

- Welfare to Work Act
- Older American Act Title III funds, Department of Economic Security
- Division of Developmental Disability funds
- Transportation funding through Medicaid administered through the Arizona Health Care Cost Containment System
- Head Start, Behavioral Health Funding
- Transit fares

Economic Strength Projects Fund

Local governments are eligible sponsors and co-sponsors of transportation projects financed by the Arizona Economic Strength Projects fund. This fund is sponsored by the Arizona Department of Commerce and funded by HURF. A local match must provide at least 10

percent of the project cost. The fund finances selected road projects that support economic development objectives.

Governor's Office of Highway Safety

Federal funds are allocated to finance state and local government highway safety projects. These program funds, in the form of reimbursable contracts, are administered by the Governor's Office of Highway Safety. Funds are provided under the National Highway Safety Act and funded through grants from the FHWA and the National Highway Traffic Safety Administration (NHSTA). The safety priority areas are listed below:

NHSTA Priority Program areas:

- Police traffic services
- Impaired driving
- Traffic records
- Pedestrian/bicycle safety
- Emergency medical services
- Occupant protection
- Motorcycle safety

FHWA Priority Program areas:

- Corridor safety improvement programs
- Safety studies of specific safety problems
- Outreach programs
- Rural and local technical assistance programs
- Pedestrian and bicycle safety
- Safety management systems

Pedestrian/Bicyclist Funding

Revenue sources for bicycle facilities primarily for transportation are available from the following sources:

- Federal funds are available to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the NHS.
- Federal Lands Highway Funds are available to construct bicycle facilities and pedestrian walkways in connection with roads, highways, and parkways. These funds are at the discretion of the department administering the funds.

Other funds for bicycle and pedestrian facilities are:

- National Recreational Trails Fund, which provides funds for recreational programs for bicyclists and pedestrians.
- Scenic Byways Program can fund bicycle facilities along highways.
- Federal Transit Funds can be used to provide bicycle and pedestrian access to transit facilities including shelters and bicycle parking facilities.

Another potential funding source for trails is the Heritage Fund. The Arizona State Parks Board Heritage Fund legislation stipulated the use of Arizona Lottery Fund revenues for trails. Eligible projects are trail land acquisition, design, engineering, development and renovation activities, and trail support facilities.

Community Development Block Grants

Community Development Block Grant (CDBG) are funds provided by the Federal Office of Housing and Urban Development. The CDBG funds can be used in the construction of capital improvement projects such as sewer, streets, water and wastewater treatment plants, housing, and parks that benefit low to medium income groups. Projects that alleviate slums or address an urgent need such as circumstances caused by a natural disaster can also use CDBG funds. For a transportation improvement to be eligible for CDBG funding, the project must be located in a census tract or block group with at least 51 percent of the population in the low and moderate-income group.

Regional and Local Funds

State law provides for the exaction of transportation excise taxes, which are subject to voter approval. General revenue from local sales and property taxes is a potential source of transportation funding. CYMPO member agencies use these taxes to provide additional revenue for transportation projects. Other local funds could be collected through sales tax increases and the potential use of the Regional Road Area Fund.

A funding source, in Yavapai County, is a one-half percent sales tax. The County adopted this tax in FY 1996. The tax does not have any sunset provisions and will be in effect until removed by the Board of Supervisors. Currently, sixty percent of the tax is used for roadway projects. Prescott has a similar tax in the amount of one percent dedicated to transportation infrastructure, while Prescott Valley assesses a one-third of a cent sales tax dedicated to transportation improvements.

Private Contributions

Developers may be required to help pay for the cost of transportation improvements necessitated by their developments. This requires a Traffic Impact Analysis to demonstrate that substantial additional traffic will be generated by the development. Several institutional mechanisms are available, including cost sharing agreements, impact fees, and special assessments. In cases where right-of-way needed for a roadway is privately owned, right-of-way dedications can be made a condition of new development prior to the issuance of the necessary permits.

Developers are sometimes willing to share the cost of new transportation facilities to serve their properties. In Arizona, ADOT has reached several agreements with private interests to share the cost of new freeway interchanges.

Improvement districts represent another form of private financing, wherein a group of property owners formally agree to contribute to infrastructure improvements that will directly benefit them. Formation of an improvement district requires both legislative and voter approval.

Special Assessment Districts

Special Assessment Districts are designated areas in which property owners are assessed a fee to offset the cost of improvements that benefit the district. Special Assessment Districts are authorized in all 50 states and have been used throughout the country for a variety of infrastructure needs. Although special assessment districts have been generally used within existing developed areas to replace or enhance public services, recent trends include the use of such districts for financing infrastructure costs for large single developments. Special assessment districts are allowed by Arizona State law for both cities and counties. However, Arizona counties currently are not authorized to initiate a district, although cities and towns are. This difference results in a significant variation in the methods used to establish the districts and tends to limit the use of special districts by counties.

The cost of improvements within a Special Assessment District is assessed to property owners on the basis of value. Costs are recovered annually or semiannually when property taxes are paid to the county treasurer. It is conceivable that special assessment districts can fail if the development does not build out quickly enough to pay back the district's indebtedness. Accordingly, caution must be used whenever improvement districts are allowed for speculative development.

Impact Fees, Right-of-Way, Facilities In-Lieu

Traffic impact fees, development impact fees, dedication of right-of-way, and/or construction of facilities in-lieu are additional local funding sources. Development impact fees are revenues collected from land developers to provide funding for additional capacity in public infrastructure needed to serve the development. Local government has the legal authority to impose such fees, but must do so within a strict legal framework. The fundamental legal test of an impact fee's application is whether the fee is based on the proportionate impact of the development and is used to mitigate that impact. Impact fees, when legally challenged, must pass the *rational nexus* test and meet constitutional standards for property rights and due process. Since roadway improvement often requires additional right-of-way, private developers should be asked to incorporate potential right-of-way into their plans. In addition, right-of-way exactions from developers should be sought through the coordination with location planning and zoning authorities.

Toll Roads

The privatization of new or existing roadways typically results in the creation of a toll system for the use of the facility. Toll roads have recently been permitted by state law and presidential executive order. Although toll roads may be feasible on limited access routes, as a practical matter they can be implemented on access controlled facilities only. Toll collection, therefore, may be considered an alternative funding source for controlled-access facilities, but is not currently a viable mechanism for funding typical county roads.

Dedication of Rights-of-Way

Landowners and developers can be required to dedicate right-of-way for public streets fronting their property. An owner with property on only one side of the road would be required to dedicate half of the total width required. Although no money actually changes hands in the dedication, the value of the land does represent a substantial monetary contribution to the roadway program.

Construction by Developers

In addition to right-of-way dedication, the appropriate jurisdiction may require developers to construct all or portions of roads that serve their property. The municipalities and the county should review their existing policies regarding developer participation to determine if a fair share of the costs is being recovered from developers.

5. IMPLEMENTATION GUIDELINES

This chapter presents guidelines for improving the efficiency of the roadway system. These include the following: roadway improvement guidelines, corridor preservation tools, and access control guidelines.

ROADWAY IMPROVEMENT GUIDELINES

Roadway Widening

The need for roadway widening to increase capacity is triggered by an existing or projected (short-term) level of service of D or worse. The analysis of segment level of service is based on the number of lanes, the functional classification of the roadway, the maximum desired level of service capacity, roadway geometrics, and the existing or forecasted average daily traffic (ADT) volume.

The actual functional capacity of roadway facilities varies by the characteristics of each facility under review. Typically, the performance and LOS of a roadway segment are based on the ability of arterial intersections to accommodate peak hour volumes. Special designs of intersections to achieve acceptable levels of service and lower levels of approach delay could result in higher capacities than the estimated ones.

CORRIDOR PRESERVATION

Introduction

A persistent challenge for transportation agencies is protecting the integrity of their plans for the construction or extension of new roadways and the expansion or widening of existing roadways. If development is allowed to encroach upon proposed roadway rights-of-way, the result will be either costly and inefficient realignment, or the costly and time consuming process of purchase or condemnation of developed land for the needed right-of-way.

The implementation of these measures involves all levels of government (state, county and local) acting in concert. Another point worth mentioning is that all roadway expansions are not equal. The measures discussed in this section are applicable for all types of roadway expansions, but the reader should understand that protecting the corridor for an at-grade two-lane collector street is different from protecting the corridor of a multilane limited or controlled access facility. While the tools will be the same, the degree of difficulty or expense will increase. Also, land use planning for such a facility needs to focus more on nodal development, with less intense development in the intervals between access points.

Corridor Preservation Tools

In order to preserve corridors for new highways and the expansion of existing roadways, the first order of business is to identify the location and the timing of the development of these facilities. In that respect, Transportation Plans or Community General Plans, which are required to include a circulation element, are the primary tools for delineating corridors for extending and expanding roadway facilities. Once the corridors are identified, they can then be protected.

Arizona State statutes require that municipal planning agencies "shall prepare" and that legislative bodies "shall adopt" a "comprehensive, long-range general plan for the development of the municipality." ARS 9-461.05.C2 mandates that, for municipalities, the plan shall include "a circulation element consisting of the general location and extent of existing and proposed freeways, arterial and collector streets.... all correlated with the land-use element of the plan." The circulation element may also include recommendations concerning "building setback requirements" and a transportation element "showing a comprehensive transportation system, including locations of rights-of-way."

After the roadway corridors have been identified, a second line of defense is to ensure that the general or transportation plans are adhered to and that development does not occur in "protected" areas. A good mechanism to ensure the preservation of these corridors is to establish comprehensive development review procedures that take into account future roadway extension and expansion. One common technique is to employ a checklist of review criteria that must be consulted during development review. The checklist will establish whether the area being reviewed is within a corridor preservation zone. Another technique is to forward all requests for development to a community's transportation or public works department. This ensures that the professionals most knowledgeable about roadway plans will be involved in the review process and will flag development proposals that will adversely impact their transportation plans.

Another tool for corridor preservation is a community's subdivision ordinance. The subdivision ordinance can require that preliminary and final subdivision plats be reviewed by the transportation and public works department of the community. The ordinance can also stipulate that the plats must be submitted to the county or state transportation department for their review.

An additional tool that can be used to preserve corridors is the zoning ordinance, through the use of required front, side, and rear yards and their respective setback requirements. Once roadway alignments have been identified and incorporated into a community's plans, required setbacks can be computed from the location of the proposed right-of-way. This will ensure not only that the right-of-way will be preserved, but also that structures will be set back from the right-of-way at such a distance to ensure safe ingress and egress after the roadway is developed. Aside from establishing standards, a community's zoning ordinance can also be used to protect corridors through the zoning map. The zoning map determines what land uses are appropriate to specific parcels of land. Large lot zoning (one acre in size or larger) will ensure that development pressures are more limited and less intense than zoning designations

for multi-family development. Consequently, large lot zoning might be more appropriate along corridor alignments that need to be protected. Aside from ensuring that there will be less development pressure along specific alignments, large lot zoning will also enable property owners to have ample land to meet minimum setback requirements, even when calculating for the impacts of future right-of-way expansions onto their properties.

Another mechanism employed in conjunction with the zoning map is the creation of special zoning districts. For example, a planning agency could delineate Future Development (FD) zoning district. These districts could consist of land primarily on the periphery of the community that do not have the necessary services (roads, water, sanitary sewers) for development. As a result, development on these parcels is limited to a handful of minimally intrusive land uses, such as parking lots, parks, etc. In effect, through the land use designation of the zoning ordinance, land can be placed in a "holding pattern," thereby ensuring the preservation of specific corridors.

Another technique to preserve roadway corridors is to use "urban service areas" or "growth boundaries" to delineate the outermost limits of urban development. Under the concept of an urban growth boundary, development plans will not be reviewed, much less approved, if they fall outside a designated growth boundary. If a community employs this approach, it can protect future roadway corridors by ensuring that key alignments are located outside the growth boundary, thereby reducing or eliminating pressures for development along the corridor.

Another tool that can be used to protect roadway corridors is the creation and adoption of an access management program. This strategy is particularly useful in preserving the integrity of roadways that are currently developed. By reducing ingress and egress frictions, meaningful access management programs increase roadway capacity, thereby negating the need, at least in the short-term, to expand existing roadways. Access management, coupled with prudent land use planning which ensures that roadway capacity will not be overburdened by future development, may in some cases eliminate the need for future expansions. Access control and management is addressed comprehensively in a subsequent section of this Report.

The pressures of growth and concern about urban sprawl have encouraged some communities to adopt "concurrency" ordinances. Concurrency ordinances are intended to ensure that growth cannot occur in an area unless adequate public facilities are either in place, planned, or built concurrently with proposed development. These programs have been adopted to prevent an unacceptable decline in the provision of urban services to existing residents and to meet the demands of new residents. From a transportation planning perspective, concurrency requirements ensure that development will not occur without the requisite roadway improvements which, presumably, will occur only in conformity with adopted plans and ordinances.

From a financing perspective, it is important to note that, in its pure form, concurrency does not require that new development be paid for by developers, but only that the required improvements be made prior to or concurrently with the development. The question of financing the improvements is related to impact fees and other funding mechanisms.

An advantage of concurrency ordinances is that they reduce or eliminate leapfrog development and the high cost of infrastructure expansion. They incorporate the CIP into the planning process and direct development to areas where the delivery of services (including roadways) is the most cost-effective.

While the zoning ordinance, subdivision ordinance, development review, urban growth boundaries, access management, concurrency requirements, and use of the capital improvement program all provide some degree of corridor protection, the most fool-proof method for preserving roadway corridors is, once these corridors have been identified, to protect their integrity through the advance purchase of right-of-way. However, while this tool will provide the greatest degree of protection, it is also the most costly way to protect roadway corridors.

Implementation

Determining the importance of a particular roadway is a complex undertaking and a number of variables should be involved in the determination. For instance, measures of congestion such as volume-to-capacity ratios are important indicators of the importance of a roadway expansion. Average daily traffic volume (existing and forecast) should also be considered. Roads carrying greater volumes should generally be assigned a higher priority level than those carrying less volume. Accident rates are yet another variable to consider in determining the importance of a roadway expansion.

Table 33 provides a sample matrix of a general overview of the priority for allocating resources for corridor preservation planning. In general, major roadways located in fast growing areas should have the highest level of priority. Less important segments located in slowly growing areas should receive fewer resources.

TABLE 33. SAMPLE PRIORITY MATRIX FOR CORRIDOR PRESERVATION ROADWAY IMPORTANCE

Importance	High Growth	Moderate Growth	Slow/No Growth
High	Highest Priority		
Medium			
Low			Lowest Priority

Table 34 provides another sample matrix for allocating resources based upon the rate of growth, whether an area is already developed or vacant, and whether right-of-way is needed for the roadway improvement in question. This matrix would also be filled out by the local governments and ADOT to aid in identifying the highest priority corridors.

TABLE 34. SAMPLE PRIORITY MATRIX FOR CORRIDOR PRESERVATION RIGHT-OF-WAY NEEDS

Existing Development	Rate of Growth					
	Fast Growth		Moderate Growth		Slow/No Growth	
	ROW Needed	No ROW Needed	ROW Needed	No ROW Needed	ROW Needed	No ROW Needed
Vacant	Highest Priority					
Partially Developed						
Fully Developed						Lowest Priority

Table 35 provides an overview of the different types of implementation techniques, their degree of difficulty to implement (in terms of time). Additionally, this table can be used to identify which agencies can use them.

TABLE 35. IMPLEMENTATION TECHNIQUES

Tools	Long Lead Time	Moderate Lead Time	Immediate
General Plan			
Zoning Ordinance			
Subdivision Ordinance			
Acquisition			
Access Management			
Urban Growth Boundary			
Concurrency Ordinance			
Capital Improvement Program			

ACCESS CONTROL

Access on the new regional roads must be preserved through designation of the roadways as limited or controlled-access highways. Major arterial roads should be limited access, and freeways must be controlled-access highways with full grade-separated interchanges. In addition, the Access Management Plans for specific facilities must be followed to preserve access along the route. Specific community plans along major roads should define how right-of-way along the route should be preserved.

Access control must be preserved along SR 89, SR 89A, SR 69, and SR 169 before future development degrades access, where possible.

Table 36 presents a preliminary attempt at prioritizing both the need for corridor preservation and access control for some of the various roadways proposed in the plan.

TABLE 36. RECOMMENDED PRIORITIES FOR CORRIDOR PRESERVATION AND ACCESS CONTROL

Importance of Roadway	Corridor Preservation	Access Control
High		
SR 69, SR 89, SR 89A, Fain Rd, Glassford Hill Extension to Williamson Valley Rd, Chino Bypass, New Road from SR 169 to Fain Road	High priority	Varies from managed access to full access control. Prepare an Access Management Plan, where applicable
Medium		
Great Western Blvd, Side Road, Sundog Connector, Tribal Connector, Santa Fe Loop	Moderate priority	Limited access. Prepare an Access Management Plan, where applicable.
New road Connecting Williamson Valley Rd to Center Street	Moderate priority	Moderate level of access control
Low		
Navajo Drive, Viewpoint Drive	Low priority	Low level of access control

ACCESS MANAGEMENT GUIDELINES

Introduction

Access management is the regulation of vehicular access to public roadways from adjoining property. Access is provided through legal, administrative, and technical strategies available to a political jurisdiction under its police powers in order to maintain the health, safety, and welfare of the jurisdiction's residents. All jurisdictions responsible for transportation systems and land use planning should have formal access management guidelines. The prime function of the arterial system is to move traffic safely and efficiently. However, access to abutting land also needs to be provided. To maintain the integrity of the arterial system, land access needs to be controlled and managed. The guidelines provide a reference for carrying out the planning, design, and approval of access to arterials and assist local officials and developers in understanding how access can be provided while still maintaining mobility.

The adoption of access management measures for arterial routes should occur as early as possible in the development of a community. In many cases, existing arterial access points may not comply with the guidelines. However, this should not be used as a rationale to perpetuate the problem. If all new access requests are made to comply, high levels of mobility and safety can be maintained along undeveloped or developing arterial routes. The requirement of remedial actions to address access deficiencies prior to the approval of building permits for property improvements can also correct many existing non-complying accesses over time. In this manner, communities can avoid the expensive and disruptive construction of bypass routes or the acquisition and displacement of adjacent land uses to allow arterial widening.

Access Management and Land Use

The concept of roadway functional classification is closely related to land access. At one extreme, arterial roadways are primarily intended for mobility and not for land access. At the other extreme are local roads that provide access to developed land with little emphasis on mobility. Intermediate roadways, classified as collectors, provide a balance of both mobility and land accessibility.

A relationship exists between transportation facilities and nearby land development. Construction of a transportation corridor stimulates land development which, in turn, results in additional congestion. This congestion, in turn, results in improvements to the arterial system, providing even more accessibility, and stimulating more land development. This cycle continues until there is a saturation of land use, or travel demand cannot be met through transportation facility improvements. Access management can, in conjunction with a region's land development plans, help ensure an improved return on public investments in highways, while providing the necessary infrastructure to support economic development of private land within the region.

The Need for Access Management

A proliferation of closely-spaced driveways along a major commercial corridor usually exemplifies a lack of access management. In a growing community, traffic increases over time, usually at a rate greater than population growth. This places a burden on a roadway system designed to carry a specific amount of traffic at a specific level of service. As traffic increases, businesses may experience an increase in volume due to increased visibility. Conversely, these businesses may also suffer detrimental effects because potential customers perceive that additional traffic is making access more difficult. These potential customers may question the safety of driveways that are too close together or poorly designed, pose conflicts with adjacent streets, or cause traffic congestion that results in travel delays.

Without an access management program, traffic safety and operational problems are likely to worsen. Traffic accidents and delay from poor access control result in a very high cost to

society in terms of money and time. Proliferation of accesses degrades the capacity of the roadway, creating the need for roadway construction projects to offset the increase in travel times. The high costs associated with construction and buying new rights-of-way for widening often make this an undesirable solution.

Traffic Service Versus Access to Property

Although it is desirable to manage all access points along a roadway according to a set of established policies or guidelines, the rights of property owners must be considered. The local jurisdiction has the responsibility to allow "reasonable access" to a site. However, the definition of "reasonable access" may be interpreted differently by a property owner than by the reviewing agency. Essentially, the reviewing agency and the owner have two different objectives. The agency is seeking an access design that provides the least amount of impact and greatest vehicular mobility on the surrounding major street network. On the other hand, the owner normally wants a plan that can handle as much traffic as possible without providing inconvenience to customers and employees. An example of this conflict is a raised median island that prevents left-out/left-in maneuvers at a shopping center. The agency may view this as an effective method of managing access and reducing accidents. The owner may consider this a deterrent to customers. However, studies of variation in sales at businesses with and without median openings have shown very little difference except for traffic-serving businesses such as drive-through restaurants, gas stations, etc. In most cases, once an access has been installed, it is very difficult to restrict or close it without compensating the owner.

Typically, on high speed major roadways, mobility is the primary concern. An example of a roadway where mobility is the primary function is I-17, where the only access points are at the interchanges. Conversely, access is normally the priority on low speed minor roadways. On a residential street, for example, access is the primary function and traffic mobility is much less important.

Therefore, a balanced, comprehensive program that provides reasonable access while maintaining safety and efficiency in traffic movement is essential. On arterial roadways, frontage roads can preserve vehicular mobility while allowing access to adjacent properties.

BENEFITS OF ACCESS MANAGEMENT

Benefits of access management have been documented in the technical literature including, the Transportation Research Board *Access Management Manual* and the *Access Management Awareness Program: Phase II Report,* December 1997, Iowa State University. Benefits of access management documented by these two reports include the following:

- Access management leads to a reduction in annual accidents and depending on the access management techniques implemented this reduction could be significant.

- Access management improves the level of traffic service to motorists at peak hour and increases operating speeds.
- Access management projects according to the 1997 study generally do not have an adverse effect on the majority of businesses.

Ninety to 100 percent of motorists surveyed in the 1997 Iowa study reported a favorable opinion of improvements made to roadways that involve access management.

ACCESS MANAGEMENT STRATEGIES AND TECHNIQUES

Access can be controlled through the use of planning and regulatory tools and through the implementation of technical methods.

Planning and Regulatory Tools

The following are planning and regulatory tools that are available to the City to control access to properties.

1. Land Division. Controlling lot dimensions has an impact on driveway spacing, on-site circulation, and driveway lengths. Lot dimensions can be controlled through minimum lot size, minimum lot frontage, set back requirements, etc.

2. Subdivision Regulation. The following procedures and regulations are access management techniques.

   a.) Site Review Process. The site plan review process can require documentation of all access points. Traffic signals, medians and on-site circulation controls can be required to ensure that standards are followed.

   b.) Regulating Lot Splits and Further Subdivisions. Various types of lot configurations encourage inadequate spacing between access points. The regulation of lot splits by jurisdictions could help to ensure increased spacing between access points.

   c.) Subdivision Regulation. Regulations could orient lots and access points to local streets away from the high traffic volume arterials.

3. Access Controls. Access to properties can be regulated through the following controls:

   a.) Location and Design. Control the number of access points in relation to road deceleration and acceleration lanes to avoid conflict points. Provide adequate design of driveway throat length to avoid a conflict with flow of off-site traffic. Provide adequate driveway spacing requirements, corner clearance, and joint and cross access configurations.

   b.) Retrofitting Non-Conforming Access. Require conformance to access control guidelines with new permit requests for new driveways, land use intensity changes, and site improvements.

4. Zoning Regulations. Zoning techniques can be used to regulate access such as:

   a.) Overlay Zoning. Standards can be tailored by priority or intensity access, safety, and congestion problems with corridor overlays for access control problem areas.

   b.) Flexible Zoning. Flexible zoning can allow for alternative site design, buffering, and screening between incompatible uses.

Access Management Projects

Projects to control access include: driveway consolidation, provision of adequate corner clearance, implementation of two-way continuous left-turn lanes, construction of frontage roads, and construction of a raised median. These techniques are desirable below:

1. Driveway Consolidation. Driveways are consolidated to limit the number of driveways per mile along a road and provide adequate spacing between driveways in order to reduce the number of conflicts.

2. Corner Clearance. This type of project involves providing adequate corner clearance by keeping or moving driveway entrances away from intersections. Improving corner clearance reduces conflicts that cause read-end accidents. In some cases driveways are moved from the main streets to side streets to clear corners.

3. Continuous Two-way Left Turn Lanes. An additional dedicated left-turn lane is provided in the center of the street to separate left-turning traffic from through traffic. Generally, these left-turn lanes are used where moderate levels of turns occur.

4. Alternative Access Ways (Frontage and Backage Roads). Access is provided to sites adjoining the main road by either frontage or backage roads. These roads separate turning movements from the through traffic on the main road.

5. Raised Medians at Intersections. Raised medians at intersections provide a center barrier near intersections to prevent some turning movements into driveways near the intersection. This reduces conflicts near the intersection.

6. Full Raised Medians. Full raised medians are barriers the full length of the main roadway that prevent both left turns and cross traffic. Full raised medians eliminate conflict points along the stretch of the median where traffic volumes are high.

ROADWAY CLASSIFICATION AND PLANNED ACCESS

Roadways provide both mobility from point-to-point and access to adjacent land uses. There is an inherent conflict since land access requires low speeds and results in inconsistent flows. Increased mobility is characterized by higher speeds and uniform traffic flows.

Roadway function establishes the type of transportation service to be provided, which is influenced by the degree of access management. Increased management of access allows uniform traffic flow and higher speeds. Table 37 shows the relationship between classifications, functions, and access management.

TABLE 37. FUNCTIONAL CLASSIFICATION AND RECOMMENDED ACCESS MANAGEMENT

Classification	Primary Function	Degree of Access Management
Major Arterial Streets	Mobility	High
Minor Arterial Streets and Collector Streets	Mobility/Accessibility Transition	Moderate
Local Streets	Accessibility	Minimal

Source: BRW, Inc.

The purpose and primary characteristics of each class of roadway in the study area are briefly summarized as follows:

- The arterial system (e.g., SR 89A, SR 89, SR 69) is a system of roads and highways that can be identified as unusually significant to the region in terms of the nature and composition of the travel that they serve. The primary function of the arterial system in both urban and rural areas is to serve the major centers of activity, the highest traffic volume corridors, and the longest trips. Arterial roadways should carry most of the total urban and intercity travel on a minimum of mileage. Service to abutting land is less important than the accommodation of major traffic movements.

- Collector roadways serve somewhat different functions in urban and rural areas. Both urban and rural collectors; however, represent an intermediate position between arterial roadways and local streets in the balance between mobility and land access. Throughout the Central Yavapai area, rural collectors carry a large volume of through traffic while also providing local access. Although access management generally receives less emphasis on collectors than on arterial roadways, it is important to preserve the effectiveness of collector roadways in providing regional mobility.

- Local roadways comprise the remainder of the roadway system. They provide direct access to abutting land and access to the higher roadway systems. Service to through traffic movements is usually deliberately discouraged.

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