September 2003

Southeast Maricopa/ Northern Pinal County Area Transportation Study

FINAL REPORT

GILA-PINAL COUNTIES REGION V

MARICOPA ASSOCIATION of GOVERNMENTS

Southeast Maricopa / Northern Pinal County Area Transportation Study

Final Report

Prepared for

Maricopa Association of Governments

Central Arizona Association of Governments

Arizona Department of Transportation

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100 YEARS

September 2003

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1.0 INTRODUCTION

The Southeast Maricopa/Northern Pinal County Area Transportation Study (SEMNPTS) was a project jointly sponsored by the Maricopa Association of Governments (MAG), the Central Arizona Association of Governments (CAAG), and the Arizona Department of Transportation (ADOT).

The purposes of this study were to document the transportation relationships between Maricopa and Pinal Counties, examine the long-range transportation needs of the study area, and identify realistic projects to address the area needs. Ultimately, the projects identified in the study will be evaluated in a regional context in the MAG Regional Transportation Plan (RTP) process. Pinal County projects will be used by CAAG and Pinal County in their long-range planning process. Recommendations affecting current or potential future state facilities will be considered by ADOT.

The Southeast Maricopa/Northern Pinal County Area Transportation Study was separated into three major phases.

1. Review existing conditions and trends; document future travel demand and issues.
2. Identify and evaluate transportation improvement options.
3. Develop a list of future transportation needs for the study area.

In order to accomplish these three phases, the project included a number of work tasks, which describe specific elements of work. Several of these tasks were documented in separate working papers during the study. This Final Report and a separate Summary Report documents the study process, analysis, and results.

a. Background

Transportation needs in Southeast Maricopa County and in Northern Pinal County have been studied in recent years. Various mode-specific and route-specific analyses have been done to assess the best way to address the rapid growth in the area. Each study reaches into the future to deal with the higher levels of development expected in each individual community. However, the SEMNPTS is the first formal attempt to evaluate transportation linkages between Maricopa and Pinal Counties. As both areas continue to grow, the amount of undeveloped land between them diminishes and the interaction between them increases. This trend is expected to continue.

The growth scenarios and transportation modeling for the study extends out to the Year 2030. However, one of the major purposes of the study was to develop a long-term blueprint to coordinate development of transportation facilities in the study area. This being the case, the blueprint is targeted not just to identify needs for a specific horizon year but also to provide the long-term concepts necessary for effective cooperative planning in the two-county area. As such, the timing of the development of certain components of the blueprint may extend beyond 2030, depending on how the pattern and magnitude of future growth evolves.

b. Study Area

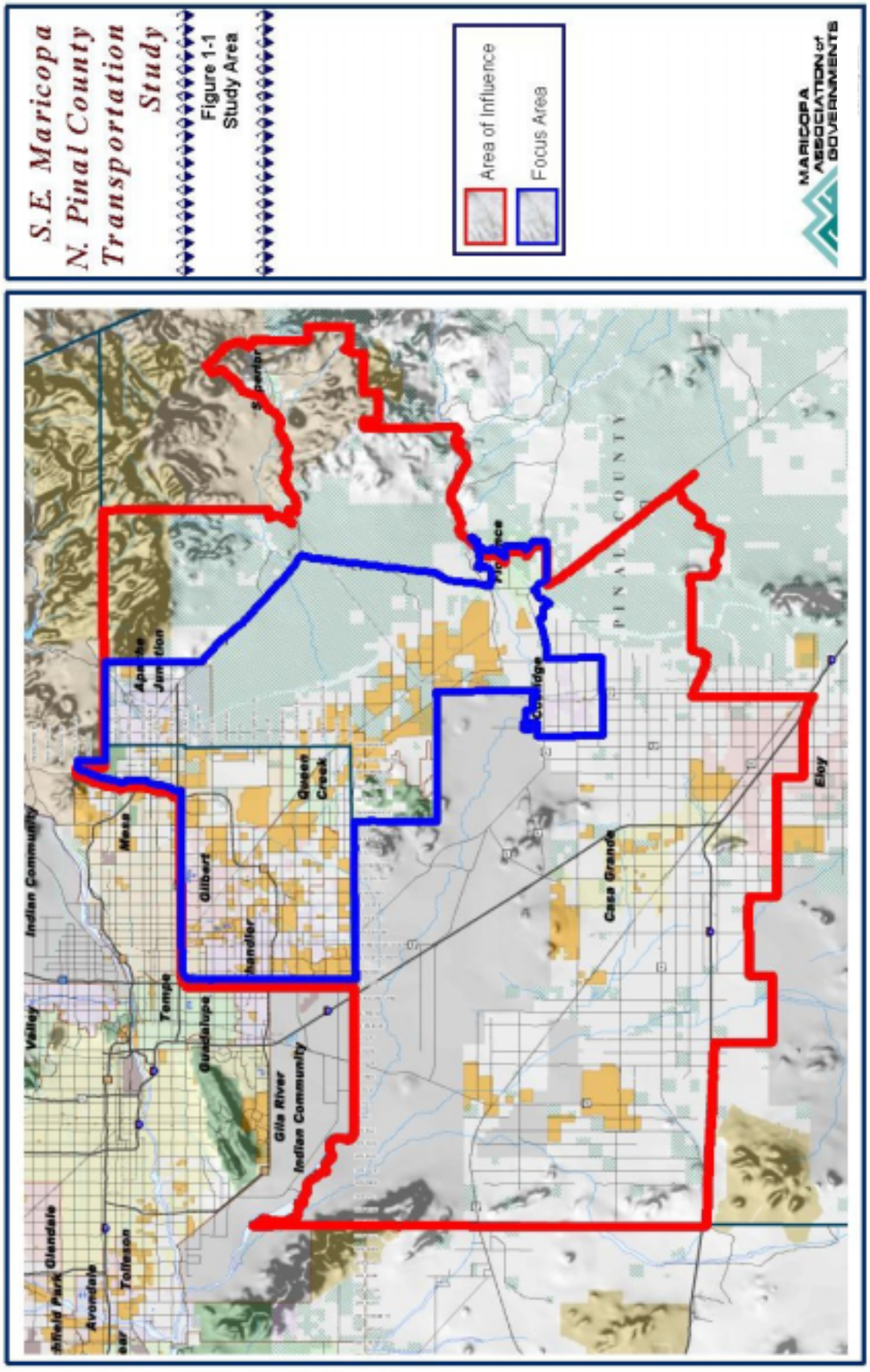
The study includes southeastern Maricopa County and northern Pinal County. The study area is broadly defined as US 60/SR 79 on the east, Loop 101 and the Gila River Indian Community on the west, US 60 on the north and Coolidge and Florence on the south. This is considered the "focus area" for the study. In addition, a larger area was defined for travel demand modeling purposes. The definition of a "model area" allows for incorporating the travel demand impacts of surrounding areas. In the study process, transportation improvements were identified just for the focus area.

The study area, outlining the focus and model areas, is shown in Figure 1-1. Generally, the analysis of growth and potential new corridors are considered for the model area in order to maintain continuity and provide a comprehensive evaluation. However, statistical summaries and comparisons presented later in the report are for the focus area only.

The jurisdictions included within the study area are: Apache Junction, Chandler, Coolidge, Florence, Gilbert, Mesa, Queen Creek, Maricopa County, and Pinal County. In addition, the effects of transportation issues in surrounding communities such as Casa Grande, Guadalupe, the Gila River Indian Community, Phoenix, Superior, and Tempe were considered.

There are a number of cultural and recreational sites within the study area:

- Boyce Thompson Arboretum State Park
- Blackwater Trading Post Museum
- Casa Grande Ruins National Monument
- McFarland State Historic Park
- San Tan Mountain Regional Park
- Tonto National Forest
- Superstition Mountains


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 1-1
Study Area
Area of Influence
Focus Area
MARICOPA
ASSOCIATION of
GOVERNMENTS
PINAL COUNTY
Florence
Coolidge
Eloy
Casa Grande
Queen Creek
Mesa
Gilbert
Chandler
Tempe
Guadalupe
Gila River
Indian Community
Indian Community
Glendale
Tolleson
Avondale

c. Study Process

The study process was led by the Maricopa Association of Governments (MAG), the Central Arizona Association of Governments (CAAG), and the Arizona Department of Transportation (ADOT) and guided by representatives of the agencies involved in the study.

There was coordination with other on-going studies listed below.

- Freeway Bottleneck Study
- Northwest Area Transportation Study
- Southwest Area Transportation Study
- Regional Transit System Study
- High Capacity Corridor Study

Two of these studies – the RPTA Regional Transit Systems Study and The MAG High Capacity Transit Plan – were incorporated into the SEMNPTS and form the basis of the transit recommendations.

The Regional Transit Systems Study tasks include:

- Assess the effectiveness of existing transit service;
- Develop recommendations to improve existing service and a performance-based structure for achieving goals and objectives; and
- Develop a financially constrained 20-year plan for future improvements.

The High Capacity Transit Plan tasks include:

- Determine the feasibility of commuter rail along existing rail corridors;
- Identify other high capacity alternatives for existing rail corridors where commuter rail is not feasible;
- Identify new high capacity transit corridors in areas without existing rail corridors;
- Create a regional high capacity transit system plan; and
- Develop an action/implementation plan to identify roles and responsibilities.

Early in the study process, a Consultation Program and Coordination Plan was prepared. This document outlined the activities planned and the participants expected in the study process. Table 1-1 presents a matrix of the consultation activities and study goals. Table 1-2 is a matrix showing the activities planned and the intended audience. As can be seen from these tables, the study process included interviews with elected officials from the various agencies involved in the study in order to obtain

input regarding their view of issues and challenges, as well as their vision for Southeast Maricopa County and Northern Pinal County.

TABLE 1-1
ACTIVITIES/GOALS MATRIX

	Consultation Plan Goals					
Consultation Activities	**Goal 1:** Inform, Educate, Engage	**Goal 2:** Provide Opportunities	**Goal 3:** Maintain Accessibility and Address Issues	**Goal 4:** Reach Broad Range	**Goal 5:** Consider and Incorporate Comments	**Goal 6:** Maintain Consistency with other Public Involvement Processes
Newsletters	●			●		
Study Status Reports			●		●	
Open House Meetings	●	●	●	●		
Bus Tour	●	●	●	●		
Stakeholder Interviews	●	●	●			●
Agency / Stake-holder Meetings	●	●	●			●
Displays	●	●	●	●		
Website	●	●	●			

TABLE 1-2
ACTIVITIES/AUDIENCE MATRIX

	Target Audiences		
Activities	Elected Officials	Agency / Stakeholder Forum	Community Stakeholders / General Public
Newsletters			●
Status Reports	●	●	
Presentations	●	●	●
Open House Meetings			●
Bus Tour	●	●	
Displays			●
Website		●	●
Meeting/Event Surveys	●	●	
Information Packets, Study Tours	●	●	
Agency Stakeholder Interviews	●	●	

A bus tour of the study area was conducted at the start of the study. The tour provided agency staff the opportunity to show and describe areas of concern. Agency forums were also conducted during the study. These meetings provided opportunity for staff and others to review progress and comment on the interim products.

There were four public open houses conducted during the study. The first two were conducted in Florence and Gilbert to receive comments on the issues, deficiencies, and transportation concepts being considered. The second two, also held in Florence and Gilbert, presented the results of the preliminary analysis of transportation concepts.

During the course of the project, Working Papers were prepared to document the results of certain work tasks. These working papers were in draft form, subject to review and comment. These working papers, comments from the reviewing agencies, and public input form the basis of the final report.

The assessment of long-term transportation improvements was accomplished using the MAG travel-forecasting model, which was expanded to incorporate portions of Pinal County. There were three transportation packages examined in this study; 1) an arterial street improvement package that included additions to the arterial street system, widening existing arterial streets, and the completion of Loop 202, 2) a freeway and highway improvement package that included widening existing freeways and state highways, and 3) new corridors. Each of these transportation packages is discussed in separate chapters in this report.

d. Summary of Previous Studies

There are a number of previous related studies that have been completed. These were reviewed to identify the relevance of recommendations and/or policies developed in those studies to the SEMNPTS. For purposes of understanding, the various products have been grouped into four categories: general, highways, transit, and bicycle/pedestrian.

Table 1-1 provides a listing of the documents reviewed, and indicates which transportation mode(s) are emphasized in that document.

TABLE 1-3
DOCUMENTS REVIEWED

	Modal Emphasis			
Document	**General**	**Highways**	**Transit**	**Bike/Ped**
Apache Junction General Plan	●	●	●	●
Bottleneck Study		●		
Casa Grande Transportation Study		●		
Central Arizona Transit Development Plan			●	
Chandler General Plan	●	●		●
Florence General Plan	●	●	●	●
Gilbert General Plan	●	●		
ITS Strategic Plan Update		●		
MAG Desert Spaces Plan	●			
MAG FY 2002-2006 Transportation Improvement Program		●	●	●
MAG Intermodal Management Plan		●	●	●
MAG Long Range Transportation Plan 2001 Update		●	●	●
MAG Park And Ride Study			●	
MAG Pedestrian Area Policies & Design Guidelines				●
MAG Pedestrian Plan 2000 Final report				●
MAG Phoenix External Travel Survey		●		
MAG Regional Congestion Study		●		
MAG Roads of Regional Significance		●		
Maricopa County Bicycle Transportation System Plan				●
Maricopa County Comprehensive Land Use Plan	●			
Maricopa County Rural Transit Development Plan			●	
Maricopa County Transportation System Plan		●	●	●
Mesa 2025 General Plan	●	●	●	●
Pinal County Transportation Plan		●	●	
Town of Queen Creek General Plan 2002	●	●		
Williams Area Transportation Plan		●	●	

The following is an analysis, by mode, of the overall relevance of the previous studies to the SEMNPTS.

General

A number of the studies cover a multimodal and/or non-transportation subject matter. Among the studies in this category are the cities' General Plans, the Desert Spaces Study, MAG's Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP), and the Comprehensive Land Use Plan developed by the Maricopa County.

The cities' General Plans address growth areas and planned land use and relate those elements to the transportation element. Typically, the transportation element includes a functional classification map, which defines the planned function of each street in the system. This is often linked to the number of lanes planned. Transportation elements can also include strategies and plans for other modes like public transportation and bicycle. Growth and the rapid pace of development are significant issues affecting several communities in the SEMNPTS area.

The MAG TIP and LRTP represent the MAG regions' current five-year transportation program and long-range plan while the Pinal County Transportation Plan presents the long-range plan for Pinal County. These studies are multi-modal.

Highways

Existing documents relating to highway issues include the cities' General Plans, area transportation plans, and regional studies like the Roads of Regional Significance, ITS Plan, the Regional Congestion Study, and the External Travel Survey.

Many of these studies include agency plans for the street system to accommodate planned growth. These plans provided the base street system for alternatives evaluation. The Regional Congestion Study was a detailed look at existing congestion at major intersections throughout the MAG region. The external travel survey provides MAG external travel pattern data that is used in the continual updating of the travel-forecasting model. The Roads of Regional Significance plan identifies major arterial streets that cross between jurisdictional boundaries and form the backbone of the regions arterial street system.

Transit

There is some transit service in the Southeast Maricopa/Northern Pinal County area. Cities recognize the need for alternative transportation as they grow, but funding has

not yet followed that realization. Most transit operations are supported by federal funding. In addition, the City of Mesa uses a portion of what is known as the quality of life tax to support transit.

Many agencies have completed transit plans or have incorporated transit as an element in their transportation plans. Maricopa County and CAAG both have prepared transit development plans for their regions. The City of Chandler has a transit plan and the City of Mesa has a transit plan element in their transportation plan. Gilbert is in the process of developing a transit plan, taking a "utilization" approach to defining future transit needs by identifying significant trip generators and attractors and linking them to provide needed transportation services.

With few exceptions, most of the communities within the study area are at the stage where developing and maintaining adequate roadways is still the highest priority. As the communities grow, developing alternative transportation modes will become a higher priority. In fact, many of the communities' General Plans identify current or projected transit needs and multimodal opportunities.

Bicycle/ Pedestrian

In most communities, providing bicycle/pedestrian facilities as a transportation mode has lagged behind development of the street system. However, most communities are now including on-street bicycle facilities as well as separate paths as part of their transportation planning. Many communities are examining the use of canal banks as shared use paths for bicyclists and pedestrians.

The Maricopa County Bicycle System Plan focuses on 112 miles of urban arterials that provide facilities for bicycling. It sets forth standards and considerations for the expansion of the bicycle system as well as costs and the funding options available to build the needed improvements. The County is developing a trail system plan that links the regional parks.

MAG's 2000 Pedestrian Plan, updating the 1993 Plan, outlines programs and actions to promote better pedestrian accommodation throughout the region's transportation network. The plan includes flexible design tools, specifically roadside design performance guidelines.

2.0 SOCIO ECONOMIC DATA

MAG maintains a socioeconomic database of existing and future data that is used in conjunction with the travel forecasting and air quality models for the MAG planning area. Periodically, MAG updates these databases when new information is available. MAG is currently in the process of updating the data based on the 2000 census information and current general plans. Sections 2.a and 2.b are an excerpt from a MAG document titled *Draft 2 Socioeconomic Projections Documentation* revised December 2002 and provide background information on the process used by MAG to develop socioeconomic projections. The Draft 2 dataset was the primary source of socioeconomic data for the SEMNPTS analysis.

For Pinal County, the recently completed Pinal County Transportation Study was used as a resource for the socio-economic data. The Pinal County Transportation Study was based on alternative socio-economic scenarios developed in conjunction with the travel-demand forecasting model. The portion of the Pinal County Transportation Study data covering the Southeast Maricopa/Northern Pinal County Area Transportation Study area was utilized to develop scenarios for this analysis. The remainder of the chapter presents existing, 2020, and 2030 population and employment and Title VI/Environmental Justice documentation.

a. Base Data

The development of population and socioeconomic projections requires the collection of a substantial amount of base data. These base data include, but are not limited to the following:

- Population and Housing: Census 2000 SF1 data
- Group Quarters (Institutional and Non-Institutional): Census 2000 SF1 data
- Employment: Employment July 1, 2000 Base
- Residential Completions: April 1, 2000 to June 30, 2000, submitted and reviewed by MAG member agencies
- Street Network: MAGNet is an electronic street network for Maricopa County and Apache Junction that is updated regularly based on the Residential Completions, reviewed by MAG POPTAC
- Existing Land Use: Year 2000 land use current as of July 2000, reviewed by MAG Population Technical Advisory Committee (POPTAC)
- Future Plans: Future Plans current as of Dec. 2001 or later, reviewed by MAG POPTAC
- Development Data: Year 2000 data current as of July 2000, reviewed by MAG POPTAC
- TAZ system: TAZ2002

- Post High School Institutions: MAG GIS & Database Enhancement Project, July 2000
- Mobile home and RV Parks: MAG GIS & Database Enhancement Project, July 2000
- Airport 2000 and projected enplanements: Regional Aviation System Plan Update.
- Projected enplanements for Sky Harbor and Williams Gateway airports.
- Retirement Areas: MAG GIS & Database Enhancement Project, July 2000
- Hotels/Motels/Resorts: MAG GIS & Database Enhancement Project, July 2000

The method of deriving the base data is discussed in the following sections.

Census Data

The most recent Decennial or Special Census provides a good source of information for developing projections. Because the census is an actual population count as opposed to an estimate, it provides a more reliable base from which to prepare projections. The following variables were extracted from the Decennial Census and used as a part of the projections base: resident population in households, resident population in group quarters, total housing units, occupied housing units, vacant housing units, housing units held for occasional use, institutional and non-institutional group quarters and households by income range.

Because the latest Decennial Census was conducted on April 1, 2000, it was necessary to adjust the database to July 1, 2000 to provide a mid-year benchmark for the projections series. This adjustment was carried out by adding the housing units constructed between April 1, 2000 and June 30, 2001 minus any demolitions. By applying Census occupancy rates and persons per occupied household to the July 1, 2000 housing stock, a July 1, 2000 population was derived.

Census information was collected by County, place, census tract, block group and block. However, because MAG prepares projections by different geographical areas, (Municipal Planning Area (MPA), Regional Analysis Zone (RAZ) and Traffic Analysis Zone (TAZ) it was necessary to reallocate the census data to this MAG geography. This reallocation was accomplished by establishing a conversion table relating the Census Blocks to the Traffic Analysis Zones. Where Census Blocks crossed TAZ boundaries population was allocated to each based upon the 2000 land use coverage. TAZs were then summed to RAZ and MPA levels of geography.

2000 Employment Database

Total 2000 employment at the County level was derived from a population control total developed by the Arizona Department of Economic Security. Total employment includes self-employed as well as wage and salary workers.

Using the 2000 Maricopa County employment control total, 2000 subregional employment estimates were prepared. An employer database for Maricopa County containing approximately 37,000 employers was purchased from Dunn & Bradstreet. This database was merged with other sources of employment data, verified through a telephone survey of the largest employers, subjected to quality control measures and reviewed by MAG member agencies.

The employment from the employer database was then benchmarked to the Arizona Department of Economic Security Standard Industrial Classification (SIC) county totals. A land use was assigned to each employer record based on industry, industry to land use relationships and Traffic Analysis Zone (TAZ) land use.

Each employer was geocoded and employment then summed by land use classification to Traffic Analysis Zones. These estimates were then adjusted to the county employment control total for employment not captured in the major employer database based on the underlying land use. This resulted in subregional employment estimates which in turn were summed to Regional Analysis Zone (RAZ) and Municipal Planning Area (MPA).

Residential Building Completions

Since April 1990, MAG has collected residential building completions by unit type from MAG member agencies. The four unit types are single family, condo/townhouse, apartment and mobile home.

After initial collection efforts, the number of residential completions are summed by unit type and forwarded to MAG member agency for review and verification. Adjustments to the total residential completions by unit type require the submittal of documentation. Each completion is also geocoded, enabling MAG to aggregate new development by MAG geography.

Existing Land Use

The existing land use database identifies the current land use pattern in the urban area. MAG maintains a 49-land use category classification that was established by MAG in concert with its member agencies.

The existing land use database was digitized by MAG staff and MAG consultants based on input from MAG member agencies and then circulated to the agencies for review and verification. Changes were made based on comments provided.

The existing land use coverage is important to the projections process because it establishes areas that have already been developed or are not suitable for further development. The developed areas become ineligible for the allocation of population and employment growth, except where the area is planned for redevelopment. Non-developable areas include open space or environmentally sensitive lands, or areas where the relief makes construction infeasible.

Future Land Use

The Future Land Use Database is based upon the plans of MAG member agencies and identifies both the type of development that is anticipated to occur in the future and the density of that development. For example, rural residential land use allows for up to one unit per acre. In those areas designated rural residential, a maximum is established so that the projections model does not exceed the one unit per acre density authorized.

The Future Plan Land Use database also uses the standard MAG 49 land use categories that allows for a direct comparison between existing and planned land use. The difference between the existing and planned land use databases helps determine where development may take place.

Large Scale Developments

A Large Scale Development Database was developed through a consultant study. Information was collected on major residential and non-residential developments including number of units or square footage by land use parcel. An estimated date for the initiation of the development was also determined. The Large Scale Development Database was used to calibrate the MAG projections model to ensure that it captured anticipated development.

MAG Sub regional Geography

Maricopa County is subdivided into 27 Municipal Planning Areas (MPAs), 147 Regional Analysis Zones (RAZs) and 1866 Traffic Analysis Zones (TAZs). Municipal Planning Areas include the corporate limits of a municipality plus any adjacent areas that are anticipated to become a part of those corporate limits in the future. Regional Analysis Zones are subunits of MPAs, and are the basic unit used by the spatial allocation model to prepare subregional projections. RAZs are further divided into Traffic Analysis Zones. The TAZ is the smallest unit for which MAG prepares projections. Their boundaries are defined using major streets and landmarks. In addition, MAG also includes parts of Pinal County in its modeling area, as transportation needs are partially dictated by the people living and working in Pinal County. Within the two Pinal County MPAs, there are an additional 16 RAZs and 81 TAZs.

Other Data Collection Efforts

Other data needed by the modeling process include post high school institutions and enrollment, mobile home and recreational vehicle parks and number of residential and non-residential units, current and projected enplanements for Sky Harbor and Williams Gateway airports, current and projected retirement areas, and hotels, motels and resorts and number of beds and employees. The data on recreational vehicle parks, hotels, motels and resorts are used to develop estimates and projections of non-resident population. The majority of this information was collected by consultants for the MAG GIS and Database Enhancement Project during 2000 and 2001. The MAG Population Technical Advisory Committee (POPTAC) then reviewed this information and provided further comments.

b. Methodology

The following is a list of assumptions and methods approved by the MAG Population Technical Advisory Committee (POPTAC) over the past two years.

MAG Geography

- Transportation Analysis Zones (TAZs) are required for transportation planning and are set by the MAG Street Committee with input from the MAG POPTAC.
- TAZs are modified as expected growth in a 30-year horizon expands geographically or densities in existing TAZs warrant TAZ splits.

- Each municipality has its own Municipal Planning Area (MPA), which delineates the area of planning concern for each jurisdiction. TAZs and Regional Analysis Zones (RAZs) fall completely within only one MPA, as TAZs add up to RAZs, and RAZs add up to MPAs.
- The metropolitan area is growing beyond the current modeling area. This includes not only areas further south and west in Maricopa County, but also areas beyond the physical boundaries of Maricopa County. Queen Creek, Peoria and the Gila River Indian Community already extend into other counties. Apache Junction has been included in the modeling area for many years. It is now necessary to extend the modeling area further south and west in Maricopa County and further into Pinal County.
- The new TAZ zone system, TAZ2002, therefore now has:
- 1947 TAZ zones, 1862 of which are in Maricopa County.
- 1941 TAZ zones are in the Transportation Modeling Area.
- 163 RAZs, 145 of which are in Maricopa County.
- 29 MPAs, 27 of which are in Maricopa County.

Base July 1, 2000 Population and Housing Variables

- The MAG socioeconomic models require a base population, housing and households from which to begin its modeling process.
- A census in 2000 for April 1, 2000 population and housing determines the base at that time.
- Additional housing units, households, population in-group quarters and population in households are derived from the Residential Completions submitted by each member agency. Residential Completions for April 1, 2000 to June 30, 2000 are extracted from the file to create the base July 1, 2000 numbers.
- These counts are then cumulated to TAZ2002.

POPTAC Recommendation:

- Use the method as described above for cumulating Base July 1, 2000 population and housing data to TAZ2002.

Base July 1, 2000 Employment by Sector

- The MAG transportation models require employment projections by five land use types, namely. Retail, Office, Public, Industrial, and Other, for July 1,2000.
- For effective transportation modeling, the employment by sector must be identified by land use sector and not by SIC categories. Thus, if an office is in a retail center, and the underlying land use is "Retail," then the office employees are in a Retail sector. Care must thus be taken to ensure proper interpretation of the results.

- The MAG socioeconomic models, therefore, require a base employment by the same five land use types, namely. Retail, Office, Public, Industrial, and Other, from which to begin its modeling process.
- A database of employment of five or more employees at any one site was collected by MAG/MAG consultants and reviewed by each MAG member agency. This database included, among other items, the name, address, SIC code, and number of employees at the site. The information was collected from various private and public sources and enhanced by phone interviews. Changes were made to the database as identified by the member agencies.
- A coverage of existing land use as of July 1, 2000 was collected by MAG/MAG consultants and reviewed by each MAG member agency. This coverage was based on land use categories approved by POPTAC prior to beginning the creation of the coverage. Changes were made to the coverage as identified by the member agencies.
- The employment locations were address matched, compared to a database of employment-based buildings, and assigned to the underlying land use sector as identified in the existing land use database.
- Where employment appeared in incompatible land use sectors, such as residential, the land use code as derived from the SIC code was used. This was to account for possible issues with small parcels of employment-based land use not identified on the existing land use database.
- Where employment appeared in a multiple use land use sector, such as Business Park, the underlying base employment was derived from the SIC code.
- After all of the known employment was allocated, the residual employment was assumed to be the 1-4 employees per site that were not collected by MAG/MAG consultants. This employment was allocated to the employment-based land use sectors identified on the existing land use coverage with limited or no employment. The database of employment-based buildings was also used. This employment used Floor Area Ratios and Employment Density factors in order to allocate the remaining employment at the appropriate densities.
- The majority of construction employment is not located at the corporate offices of the company, but at construction sites across the region. Therefore, construction employment in the Industrial Sector using the above methodology was not assigned to the employment location. Construction employment was assigned spatially to where new construction was identified in the prior two years, using both the Residential Completions database and the Development database. This employment is considered to be in the Other Sector.

<u>POPTAC Recommendation:</u>

- Use the method as described above for cumulating base employment to TAZ2002.

Population and Employment Control Totals

- MAG develops its resident population projections to be consistent with population control totals for Maricopa County developed by the Arizona Department of Economic Security.
- MAG develops its employment projections based on the population by age and sex control totals for Maricopa County developed by the Arizona Department of Economic Security.
- Delays to the development of DES population control totals means that no official control totals for population totals and for population by age and sex are available for the draft set of projections we are developing. MAG needs a draft set of projections for 2005, 2010, 2020, 2025, 2030 and 2040 for interim transportation analysis.
- In the absence of a DES population control, MAG needs to use an interim population projection and an interim employment projection as control totals for Maricopa County
- The Arizona Department of Commerce is currently spearheading a Statewide Economic Study (SES) to develop a long-range economic strategy for the State. As part of this study, a limited set of projections for Maricopa County based on the 2000 census results has been produced by the Center for Business Research at Arizona State University. Similarly, a set of population and employment projections for the Phoenix-Mesa Metropolitan Area was produced by the Economic and Business Research, Eller College of Business and Public Administration at the University of Arizona.
- The population numbers that were prepared by the Center for Business Research at Arizona State University indicate a fairly constant absolute growth in population for the Maricopa County area.

<u>POPTAC Recommendation:</u>

- Produce draft information for 2005, 2010, 2020, 2025, 2030 and 2040 only.
- Use the population control totals for 2005, 2010 and 2020 developed by the Center for Business Research at Arizona State University for the draft socioeconomic projections being prepared by MAG.
- Use growth consistent with the 2005, 2010 and 2020 absolute change in population in Maricopa County for 2025, 2030, 2040.
- Use population/employment ratios for Maricopa County consistent with the change in population/employment ratios produced by the Economic and Business Research, Eller College of Business and Public Administration at the University of Arizona.

Basic/Non-Basic Employment

- The current MAG model assigns employment to areas based on land use designations.
- Many large tracts of residential land use will have some non-basic retail, public and other employment associated with them and should have some retail, public and other employment assigned to them as population growth occurs.

POPTAC Recommendation:

- In the current MAG model, hold back 10% of retail employment, 5% of public employment and 10% of other employment for non-basic employment and assign it to the Traffic Analysis Zones where large tracts of residential development exist and where population growth has occurred.

Vacancy and Occupancy Rates

- Occupancy rates will be derived from the 2000 Census by dividing the total number of occupied housing units by the total number of housing units.
- Total housing units and total occupied housing units by block will be allocated to Traffic Analysis Zones, which in turn will be summed to Regional Analysis Zones and Municipal Planning Areas.
- The MAG models have been modified to be able to project both single family and multi-family households, using different occupancy rates.
- The 2000 Census occupancy rates by unit type became available **in** September 2002.
- Occupancy rates for TAZ zones must be derived from Census information by block.
- When there is not enough information at the TAZ zone level for projecting occupancy rates, the next level of geography (RAZ) is used.
- When there is not enough information at the RAZ zone level for projecting occupancy rates, the next level of geography (MPA) is used.
- There appear to be no adequate surveys of occupancy rates over time.

POPTAC Recommendation:

- Use 2000 occupancy rates for single family and multi-family units that bear the same relationship as the rates derived from the 1995 Special Census. This therefore assumes the same unit mix as identified in 1995. Use 2000 occupancy rates for single family and multi-family units from the 2000 Census when they become available.
- Maintain the derived occupancy rates over time with necessary modifications, as identified above, due to lack of data.

Persons per Household

- Persons per household will be derived from the 2000 Census by dividing the population in households by the number of occupied housing units.
- Total housing units, total occupied housing units and population in households will be identified by Census block.
- These variables will then be allocated to Traffic Analysis Zones, which in turn will be summed to Regional Analysis Zones and Municipal Planning Areas.

- The MAG models have been modified to be able to project population in both single family and multi-family households, using different persons per household.
- The 2000 Census information by unit type became available in September 2002.
- Persons per household for TAZ zones must be derived from Census information by block.
- When there is not enough information at the TAZ zone level for projecting persons per household, the next level of geography (RAZ) is used.
- When there is not enough information at the RAZ zone level for projecting persons per household, the next level of geography (MPA) is used.
- There are national and state surveys that review persons per household over time.

POPTAC Recommendation:

- Use year 2000 persons per household rates for single family and multi-family units that bear the same relationship as the rates derived from the 1995 Special Census. This therefore assumes the same unit-mix as identified in 1995. Use year 2000 persons per household rates for single family and multi-family units from the 2000 Census when they become available.
- Adjust the derived persons per household rates over time with necessary modifications in the rates due to lack of data.

Multiple Use Definitions by Geographic Location by Time

- The MAG projections are consistent with member agency General Plans and Planned Area Developments.
- Many of these plans, however, have areas defined as multiple use areas that can generate various types and densities of housing or employment.
- In order to use these designations in socioeconomic modeling, the multiple use categories must ultimately be converted to one or more of the standard land use categories.
- The MAG socioeconomic models have been enhanced to accommodate such multiple use categories. The models are flexible enough to allow for each individual area to have different proportions of standard land use categories.
- Default categories would assist member agencies to use categories that are consistent with past local multiple use development but can be modified, area-by-area, by the member agencies.

POPTAC Recommendation:

- Accept default land use proportions by area category, which may be modified by individual member agencies.
- Accept default land use proportions by MPA, which may be modified by individual member agencies.

- Maintain all land use proportions over time, unless modified by individual member agencies.

c. Year 2000 Data

Base year 2000 socioeconomic data was provided by MAG. The data was provided by traffic analysis zone, and included resident population, group quarters' population, resident households, group quarter households, dwelling units and employment by type. The population and housing figures by TAZ were based on Census 2000 data. In addition to the TAZ tabulation, MAG also aggregates population and employment data by regional analysis zone (RAZ) and metropolitan planning area (MPA). A RAZ is a summation of several TAZ's aggregated together to simplify reporting data. An MPA designates the planning area for each jurisdiction and includes incorporated and unincorporated areas.

Population

Table 2-1 presents a summary of the year 2000 population data for the Southeast Maricopa/Northern Pinal County study area. As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area population within Maricopa County is 385,252 and within Pinal County is 148,902 for a total study area population of 534,154. The total population for all of Maricopa County and Northern Pinal County in the year 2000 is 3,135,944.

TABLE 2-1
YEAR 2000 POPULATION-STUDY AREA

MPA	POPULATION[1]
Chandler	146,156
Gilbert	119,157
Maricopa County	8,480
Mesa	102,512
Queen Creek	8,947
Apache Junction	40,461
Coolidge	8,470
Florence	15,652
Pinal County-Focus Area[2]	7,562
Pinal County-Model Area[3]	76,757

TABLE 2-1
YEAR 2000 POPULATION-STUDY AREA (CONTINUED)

MPA	POPULATION[1]
Subtotal Maricopa County	385,252
Subtotal Pinal County	148,902
TOTAL STUDY AREA	**534,154**
TOTAL REGION	**3,135,944**

[1] Population figures do not include seasonal and transient population. MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

Year 2000 population distribution patterns in the Southeast Maricopa/Northern Pinal County area are presented in Figure 2-1. The highest population densities (500 persons per square mile) are found primarily in the northern and western portions of the study area, which reflects a pattern of growth radiating out from the core area of the region. This includes areas of Chandler, Gilbert, and Mesa. Much of the total acreage in the study area still has relatively low densities (0-10 persons per square mile). Some of these low-density areas will remain so, but large areas of land are available for development especially in southeastern Maricopa County and northeastern Pinal County.

Employment

Table 2-2 presents a summary of the year 2000 employment data for the Southeast Maricopa/Northern Pinal County study area. As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area employment within Maricopa County is 129,427 and within Pinal County is 58,776 for a total study area employment of 188,203. The total employment for all of Maricopa County and Northern Pinal County in the year 2000 is 1,640,297.

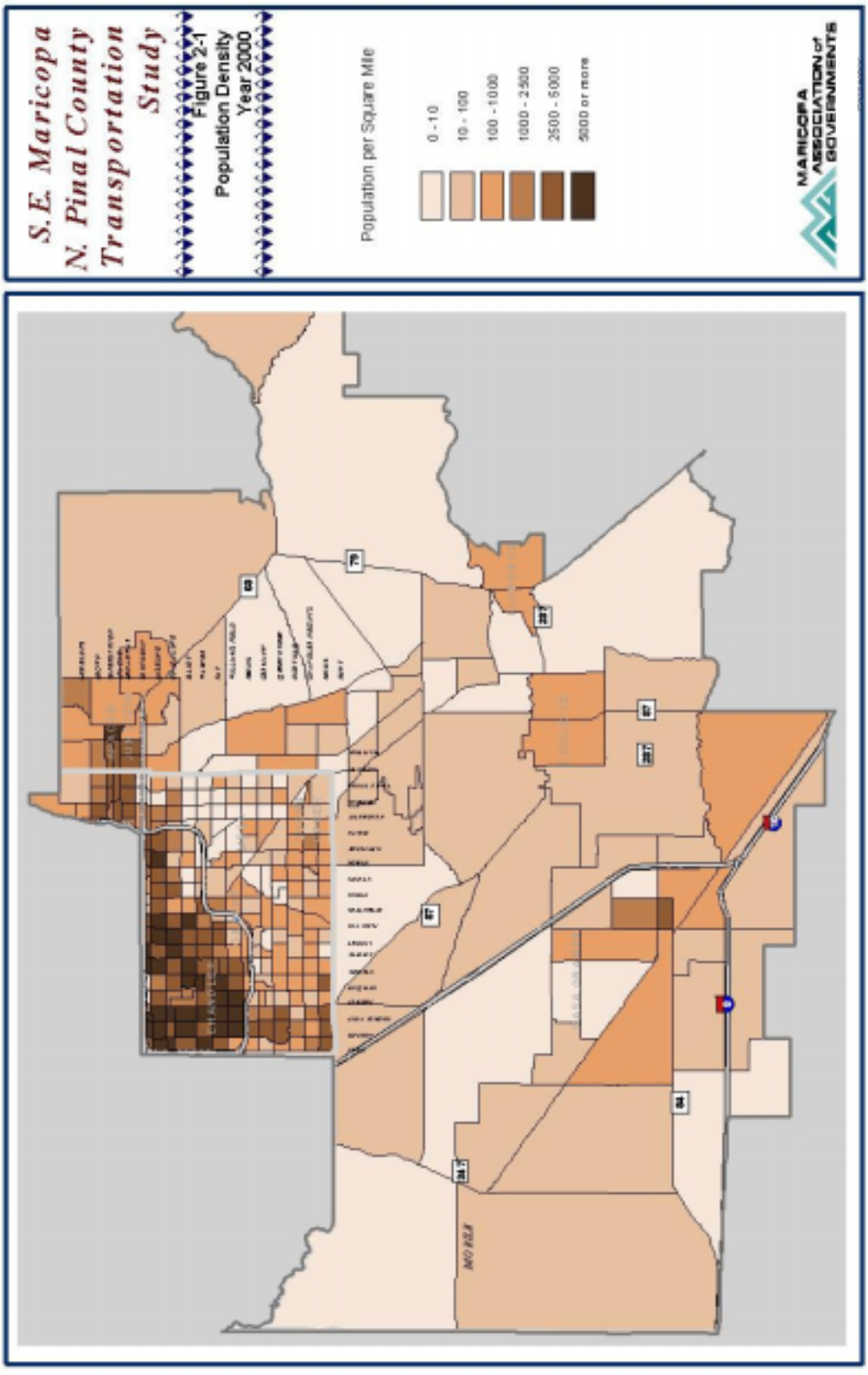

S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-1
Population Density
Year 2000
Population per Square Mile
0 - 10
10 - 100
100 - 1000
1000 - 2500
2500 - 5000
5000 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

TABLE 2-2
YEAR 2000-EMPLOYMENT-STUDY AREA

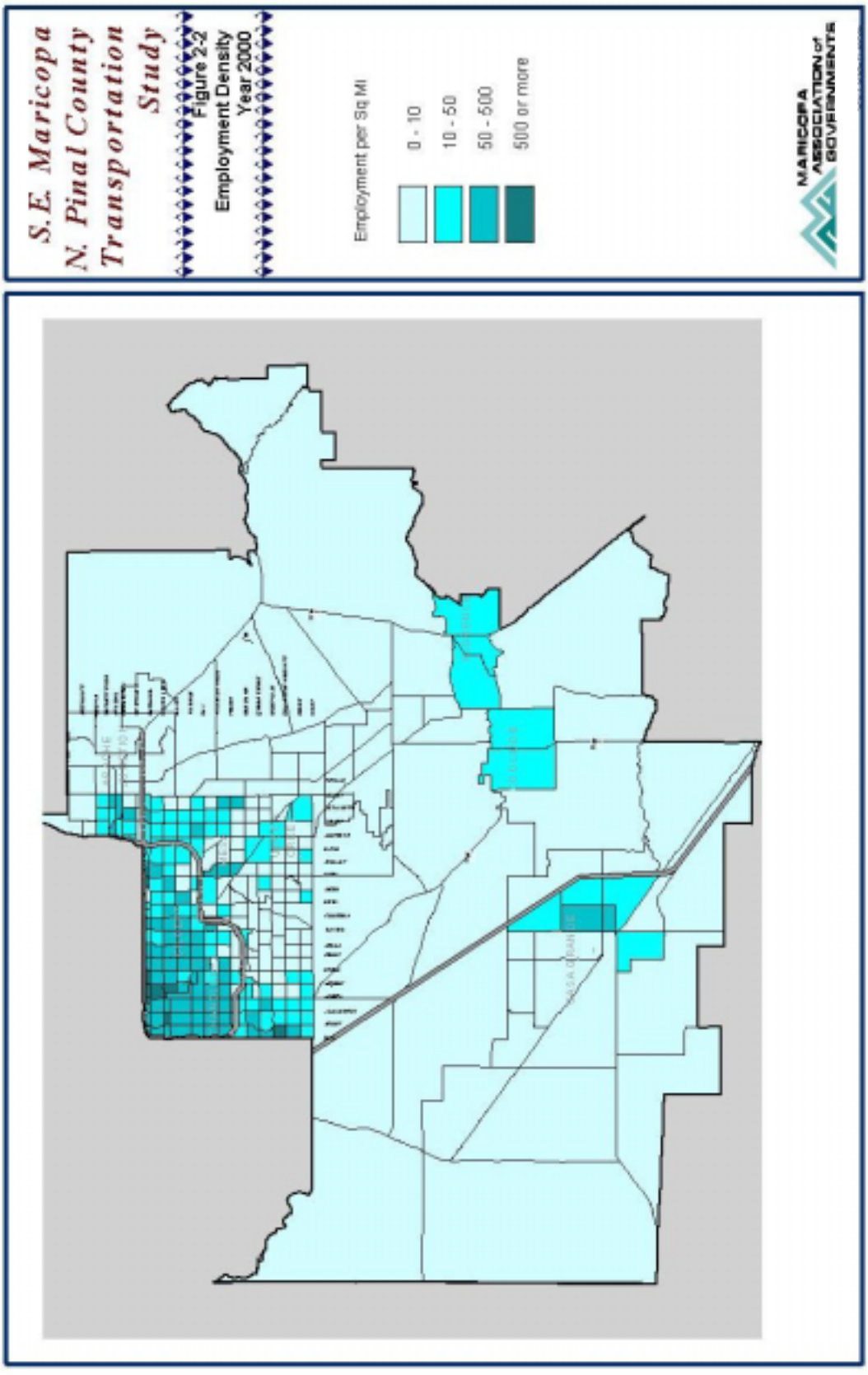
MPA	EMPLOYMENT[1]
Chandler	48,726
Gilbert	34,996
Maricopa County	1,394
Mesa	41,632
Queen Creek	2,679
Apache Junction	13,280
Coolidge	5,104
Florence	3,502
Pinal County-Focus Area[2]	2,019
Pinal County-Model Area[3]	34,871
Subtotal Maricopa County	129,427
Subtotal Pinal County	58,776
TOTAL STUDY AREA	**188,203**
TOTAL REGION	**1,640,297**

[1] MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

Year 2000 employment distribution patterns in the Southeast Maricopa/Northern Pinal County area are shown in Figure 2-2. The employment shows a pattern similar to that of population. The highest densities are found in a few zones along the north and west edges of the study area. There is very limited employment in the unincorporated areas of Pinal County.

d. Draft 2 Growth Scenarios

The years 2020 and 2030 were selected for analysis in this study. The two years represent different points in the growth of the region and allow a comparison of various performance measures. It should be noted that this analysis does not include projections for the State Land area east of Mesa and south of Apache Junction. Planning for this area has been initiated and MAG is working with Pinal County and


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-2
Employment Density
Year 2000
Employment per Sq MI
0 - 10
10 - 50
50 - 500
500 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

CAAG to develop socioeconomic projections to be used in the preparation of the Regional Transportation Plan (RTP).

Population

Table 2-3 presents a summary of the Draft 2 2020 population data for the Southeast Maricopa/Northern Pinal County study area.

TABLE 2-3
DRAFT 2-2020 POPULATION-STUDY AREA

MPA	POPULATION[1]
Chandler	243,612
Gilbert	276,790
Maricopa County	9,071
Mesa	185,275
Queen Creek	75,624
Apache Junction	56,424
Coolidge	11,512
Florence	29,601
Pinal County-Focus Area[2]	62,587
Pinal County-Model Area[3]	135,769
Subtotal Maricopa County	790,372
Subtotal Pinal County	295,894
TOTAL STUDY AREA	**1,086,266**
TOTAL REGION	**5,525,548**

[1] Population figures do not include seasonal and transient population. MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area population within Maricopa County is 790,372 and within Pinal County is 295,894 for a total study area population of 1,086,266. This represents a doubling of population compared to 2000. Certain jurisdictions including Gilbert, Queen Creek, and Florence as well as unincorporated Pinal County areas are expected to experience higher growth rates. Compared to 2000, the Pinal County part of the study

area experiences an increase of 99 percent, while the Maricopa County portion increases 105 percent. In terms of absolute numbers, the Pinal County area increases by 146,992 and the Maricopa County area by 405,120. As shown in Table 2-3, this scenario corresponds to a population of 5,525,548 in all of Maricopa County and Northern Pinal County.

The population distribution patterns in the Southeast Maricopa/Northern Pinal County area for Draft 2-2020 data are presented in Figure 2-3. The highest population densities (500 persons per square mile) continue southeasterly in Maricopa County compared to the year 2000. Significant density increases are shown along the Hunt Highway corridor in Pinal County. However, like the year 2000, much of the total acreage in the study area still has relatively low densities (0-10 persons per square mile).

Table 2-4 presents a summary of the Draft 2-2030 population data for the Southeast Maricopa/Northern Pinal County study area. As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area population within Maricopa County is 834,113 and within Pinal County is 518,081 for a total study area population of 1,352,194. This represents a 153 percent increase compared to 2000 and a 24 percent increase over draft 2-2020. Gilbert and Queen Creek as well as unincorporated Pinal County areas continue to experience higher growth rates. Compared to 2000, the Pinal County part of the study area experiences an increase of 248 percent, while the Maricopa County portion increases 117 percent. In terms of absolute numbers, the Pinal County area increases by 369,179 and the Maricopa County area by 448,861. As shown in Table 2-4, this scenario corresponds to a population of 6,815,583 in all of Maricopa County and Northern Pinal County.

The population distribution patterns in the Southeast Maricopa/Northern Pinal County area for the Draft 2-2030 data are presented in Figure 2-4. The highest population densities (500 persons per square mile) continue the pattern shown in the Draft 2-2020 data and expand southeasterly in Maricopa County compared to the year 2000. This includes further density increases along the Hunt Highway corridor in Pinal County, Apache Junction, and Casa Grande. As in the Draft 2-2020 data, there continues to be significant acreage in the study area that still has relatively low densities (0-10 persons per square mile).

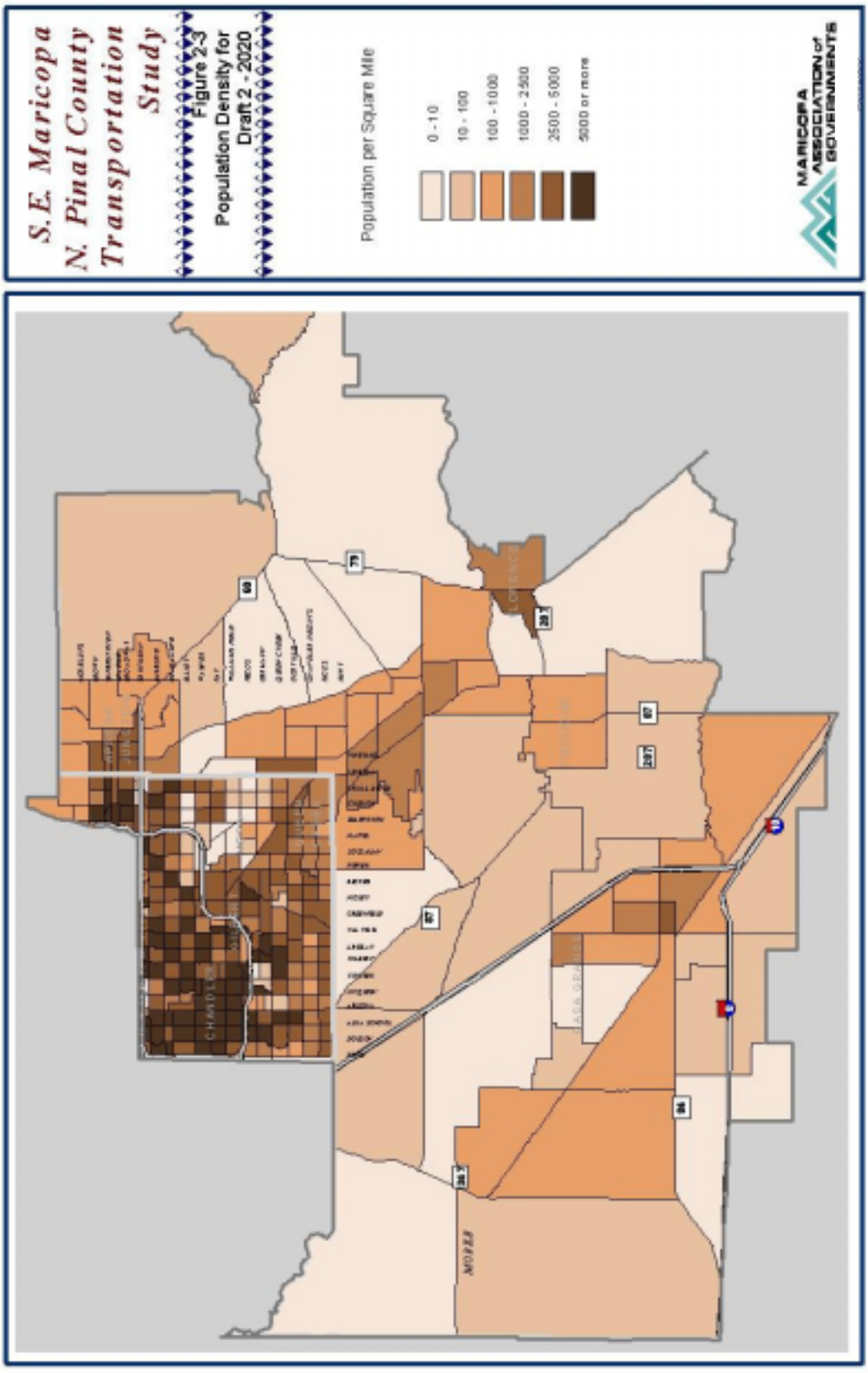

S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-3
Population Density for
Draft 2 - 2020
Population per Square Mile
0 - 10
10 - 100
100 - 1000
1000 - 2500
2500 - 5000
5000 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

TABLE 2-4
DRAFT 2-2030 POPULATION-STUDY AREA

MPA	POPULATION[1]
Chandler	246,069
Gilbert	287,296
Maricopa County	9,360
Mesa	197,861
Queen Creek	93,527
Apache Junction	63,155
Coolidge	13,295
Florence	34,189
Pinal County-Focus Area[2]	174,647
Pinal County-Model Area[3]	232,794
Subtotal Maricopa County	834,113
Subtotal Pinal County	518,081
TOTAL STUDY AREA	**1,352,194**
TOTAL REGION	**6,815,583**

[1] Population figures do not include seasonal and transient population. MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

Employment

Table 2-5 presents a summary of the Draft 2-2020 employment data for the Southeast Maricopa/Northern Pinal County study area. As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area employment within Maricopa County is 385,050 and within Pinal County is 100,881 for a total study area employment of 485,931. This represents a 158 percent increase compared to 2000. Gilbert and Queen Creek as well as unincorporated Pinal County areas show higher growth rates. The regional total employment for Maricopa County and Northern Pinal County is 2,918,881.

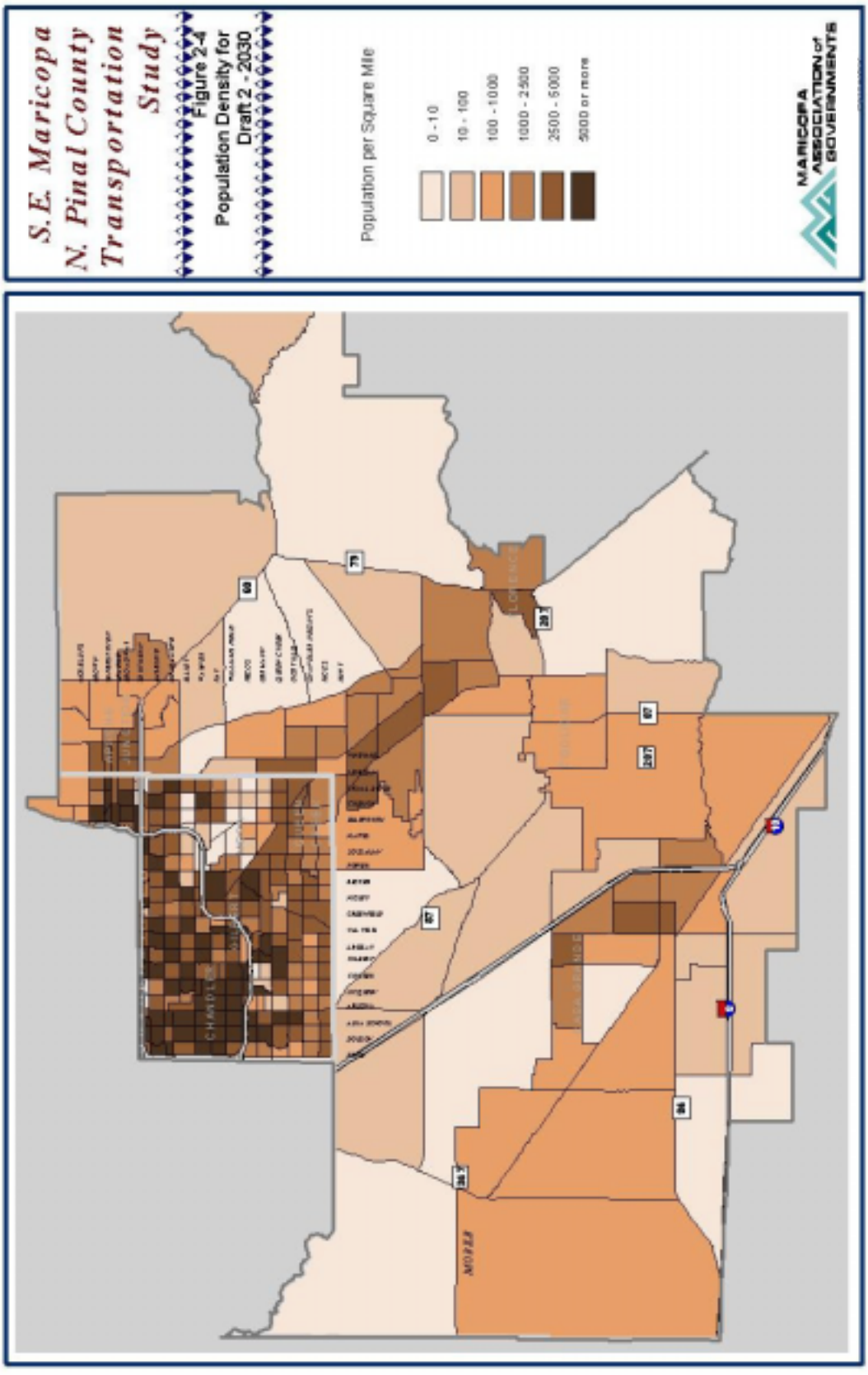

S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-4
Population Density for
Draft 2 - 2030
Population per Square Mile
0 - 10
10 - 100
100 - 1000
1000 - 2500
2500 - 5000
5000 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

TABLE 2-5
DRAFT 2-2020 EMPLOYMENT-STUDY AREA

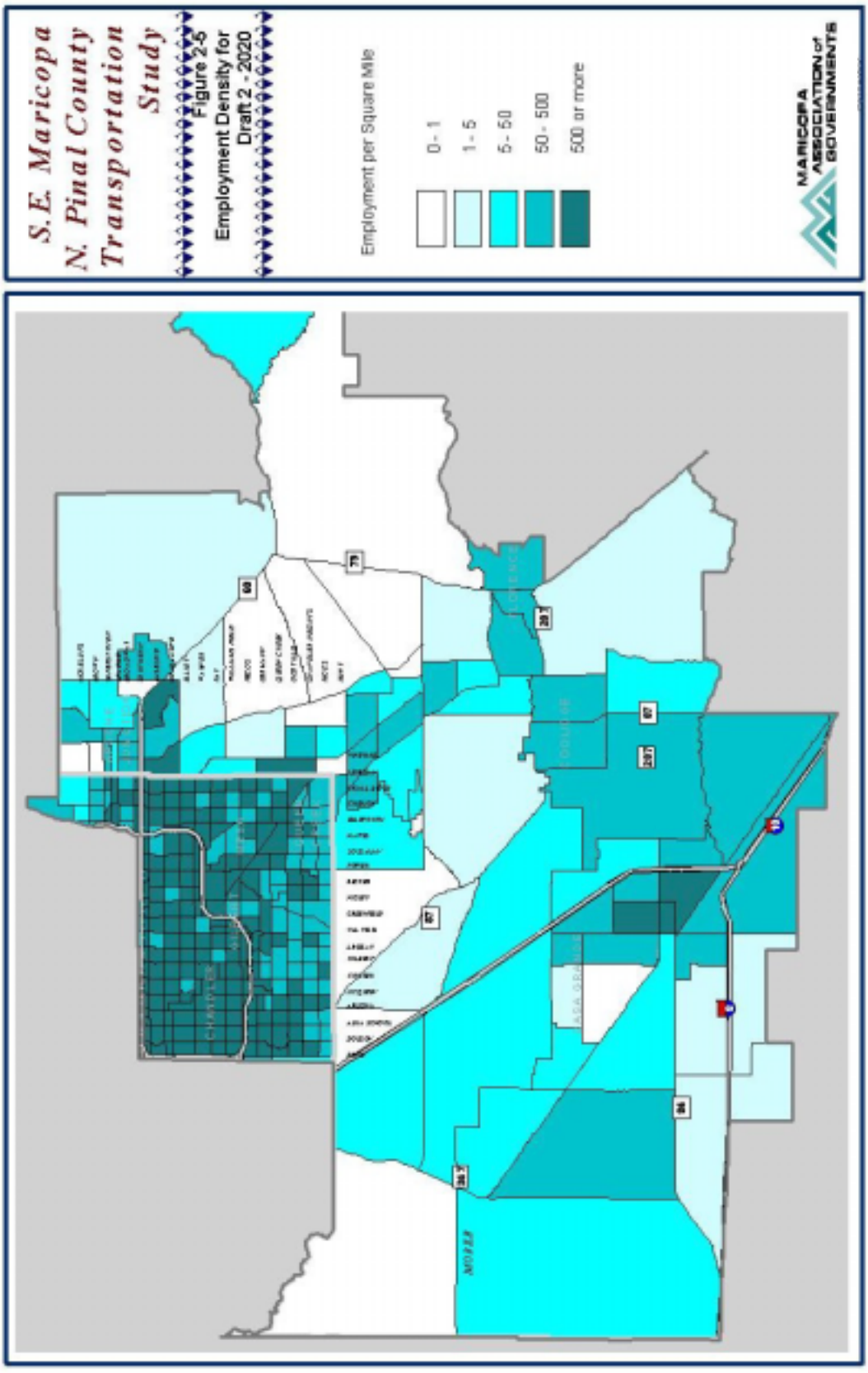
MPA	EMPLOYMENT[1]
Chandler	103,316
Gilbert	124,073
Maricopa County	1,379
Mesa	126,965
Queen Creek	29,317
Apache Junction	15,151
Coolidge	4,135
Florence	9,787
Pinal County-Focus Area[2]	8,275
Pinal County-Model Area[3]	63,532
Subtotal Maricopa County	385,050
Subtotal Pinal County	100,881
TOTAL STUDY AREA	**485,931**
TOTAL REGION	**2,918,881**

[1] MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

The Draft 2-2020 employment distribution patterns in the Southeast Maricopa/Northern Pinal County area are shown in Figure 2-5. Increased employment densities are found along the Hunt Highway Corridor and in Apache Junction compared to the year

2000. In addition, employment densities in Southeast Maricopa County south of the Loop 202 freeway increase significantly.

Table 2-6 presents a summary of the Draft 2-2030 employment data for the Southeast Maricopa/Northern Pinal County study area. As noted in the table, only a portion of Chandler and Mesa are within the study area. The study area employment within Maricopa County is 441,026 and within Pinal County is 185,081 for a total study area employment of 626,107. This represents a 233 percent increase compared to 2000 and a 29 percent increase over the Draft 2-2020 data. Gilbert and Queen Creek as


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-5
Employment Density for
Draft 2 - 2020
Employment per Square Mile
0 - 1
1 - 5
5 - 50
50 - 500
500 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

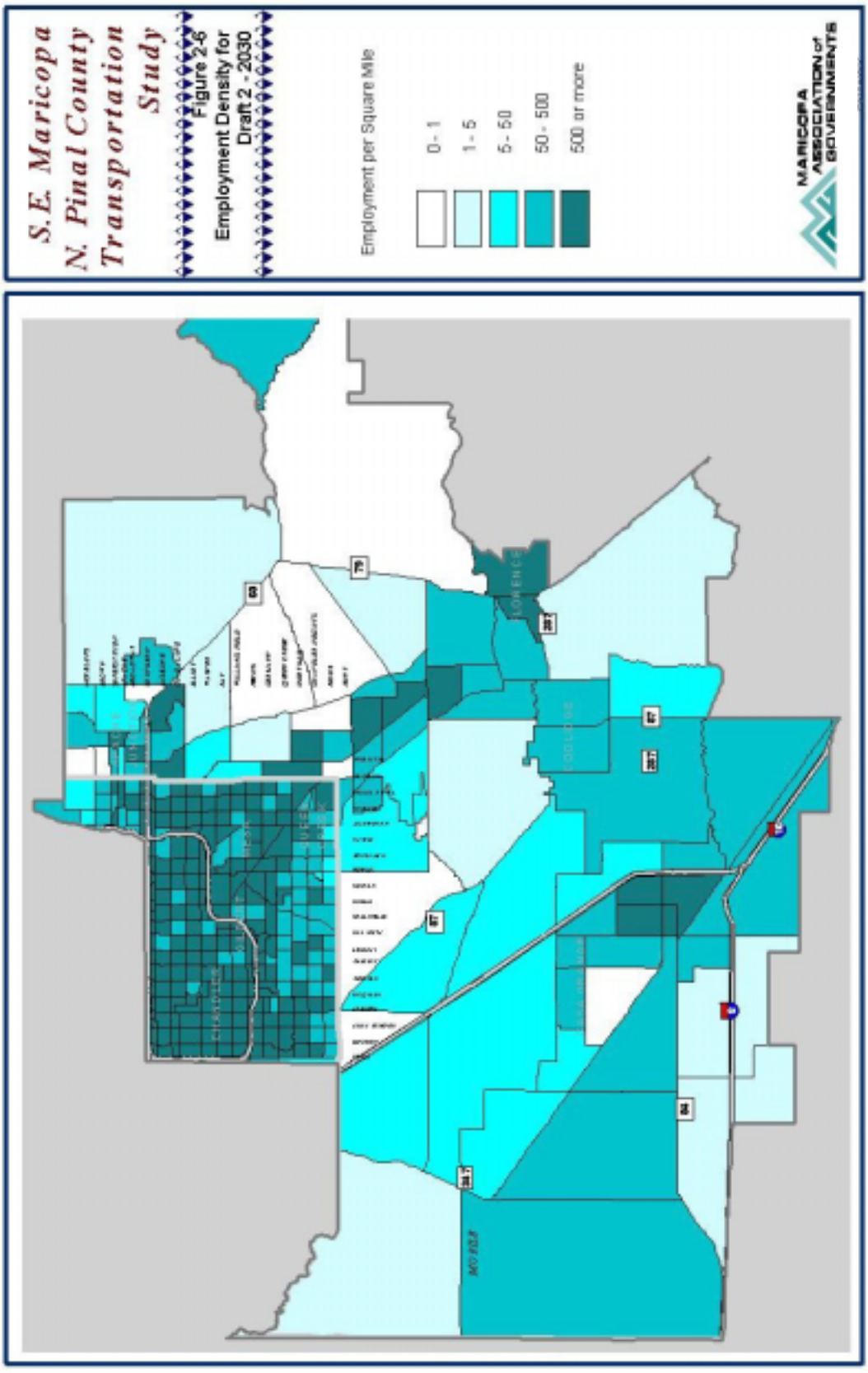
well as unincorporated Pinal County areas show higher growth rates. With the Draft 2-2030 data, the regional total employment for Maricopa County and Northern Pinal County is 3,668,663.

TABLE 2-6
DRAFT 2-2030 EMPLOYMENT-STUDY AREA

MPA	EMPLOYMENT[1]
Chandler	111,591
Gilbert	143,428
Maricopa County	1,420
Mesa	147,277
Queen Creek	37,310
Apache Junction	23,872
Coolidge	6,839
Florence	16,188
Pinal County-Focus Area[2]	28,049
Pinal County-Model Area[3]	110,133
Subtotal Maricopa County	441,026
Subtotal Pinal County	185,081
TOTAL STUDY AREA	**626,107**
TOTAL REGION	**3,668,663**

[1] MPA totals cover only the portion within study area
[2] Covers unincorporated areas within Focus Area.
[3] Covers the portion of Model Area not included in Focus Area. Includes Casa Grande, Superior, and portions of Eloy as well as unincorporated areas.

The Draft 2-2030 employment distribution patterns in the Southeast Maricopa/Northern Pinal County area are shown in Figure 2-6. Most of the employment density increases occur in Pinal County.


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-6
Employment Density for
Draft 2 - 2030
Employment per Square Mile
0 - 1
1 - 5
5 - 50
50 - 500
500 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS

e. Title VI and Environmental Justice Analysis

The purpose of Title VI and Environmental Justice regulation is to ensure that public facility projects are not developed at the expense of those populations with limited resources for self-advocacy. Specifically, all federally funded projects must demonstrate that "minority" and "low-income" populations have been identified, brought into the process and that the negative impacts of the project should not disproportionately affect these groups.

Title VI of the 1964 Civil Rights Act is intended to ensure that " no person, on the ground of race color or national origin, be excluded from participating in, denied the benefits of, or subjected to discrimination" under any program or activity receiving Federal Aid.

Executive Order 12898 on Environmental Justice signed by President Clinton in February 1994 directs that programs, policies, and activities not have a disproportionately large and adverse human health and environmental effect on minority and low-income populations. US DOT ORDER 5680-1 addresses the process by which the US DOT implements the principals of the law. In recent years there has been increased attention and focus on ensuring equity, environmental justice and Title VI compliance in the delivery of government programs.

To be consistent with the requirements of Title VI and the Executive Order for Environmental Justice, the demographic characteristics of the study area population were examined to document whether Title VI populations were located in the study area, and if so, the location.

The following demographic variables were considered:

- Race (percent minority)
- Age (percent age 60 and older)
- Mobility disability (prevalence of persons with mobility or self-care limitations)
- Low income (as defined by federal poverty guidelines)
- Female head of household (percent single female parent)

The Office of Management and Budget (OMB) issued Policy Directive 15, Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity, in 1997, establishing five minimum categories for data on race.

- Black - a person having origins in any of the black racial groups of Africa.
- Hispanic - a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- Asian - a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.
- American Indian and Alaskan Native - a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.

Mobility Disability has been defined as the populations of persons, 16 years of age and older, who have been identified as having a mobility or self-care limitation due to a health condition. These health conditions are further defined as having lasted six or more months and have made it difficult to travel outside the home unassisted.

Low-income populations are defined as households that fall below the federal poverty guidelines defined by the U.S. Department of Health and Human Services. For purposes of this study, Census 2000 STF3 data was collected and mapped at the census tract level. The poverty guidelines are presented in Table 2-7.

Figures 2-7 through 2-11 present the minority, disabled, female single head of household, poverty, and elderly groups for the study area.

TABLE 2-7
2001 HHS POVERTY GUIDELINES

2001 HHS Poverty Guidelines	
48 Contiguous States and D.C.	
Size of Family Unit	**Family Income**
1	8,590
2	11,610
3	14,630
4	17,650
5	20,670
6	23,690
7	26,710
8	29,730
For each additional person, add	3,020

Source: Federal Register, Vol. 66, No. 33, February 16, 2001, pp. 10695-10697

More than half of the study area has a minority population of 35 percent or more with a significant portion more than 50 percent. Except for approximately 13 square miles, all of this area is in Pinal County.

The majority of the disabled population (25%-35%) is in Pinal County in Apache Junction, Coolidge, east of SR 79, and west of I-10.

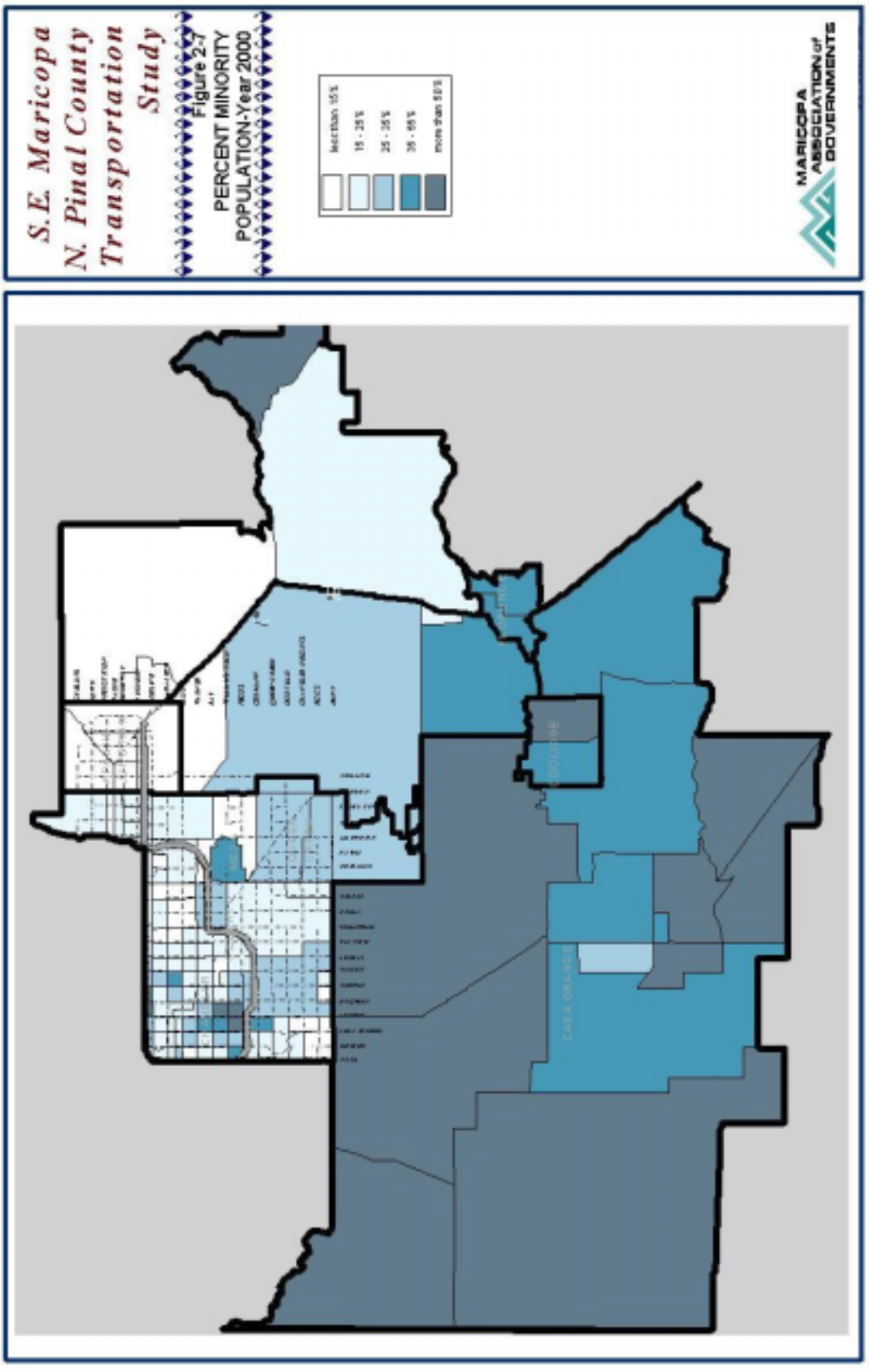
The highest single female head of household (>55%) occurs on the Gila River Indian Community. The next highest areas occur throughout the study area with portions in most of the incorporated areas.

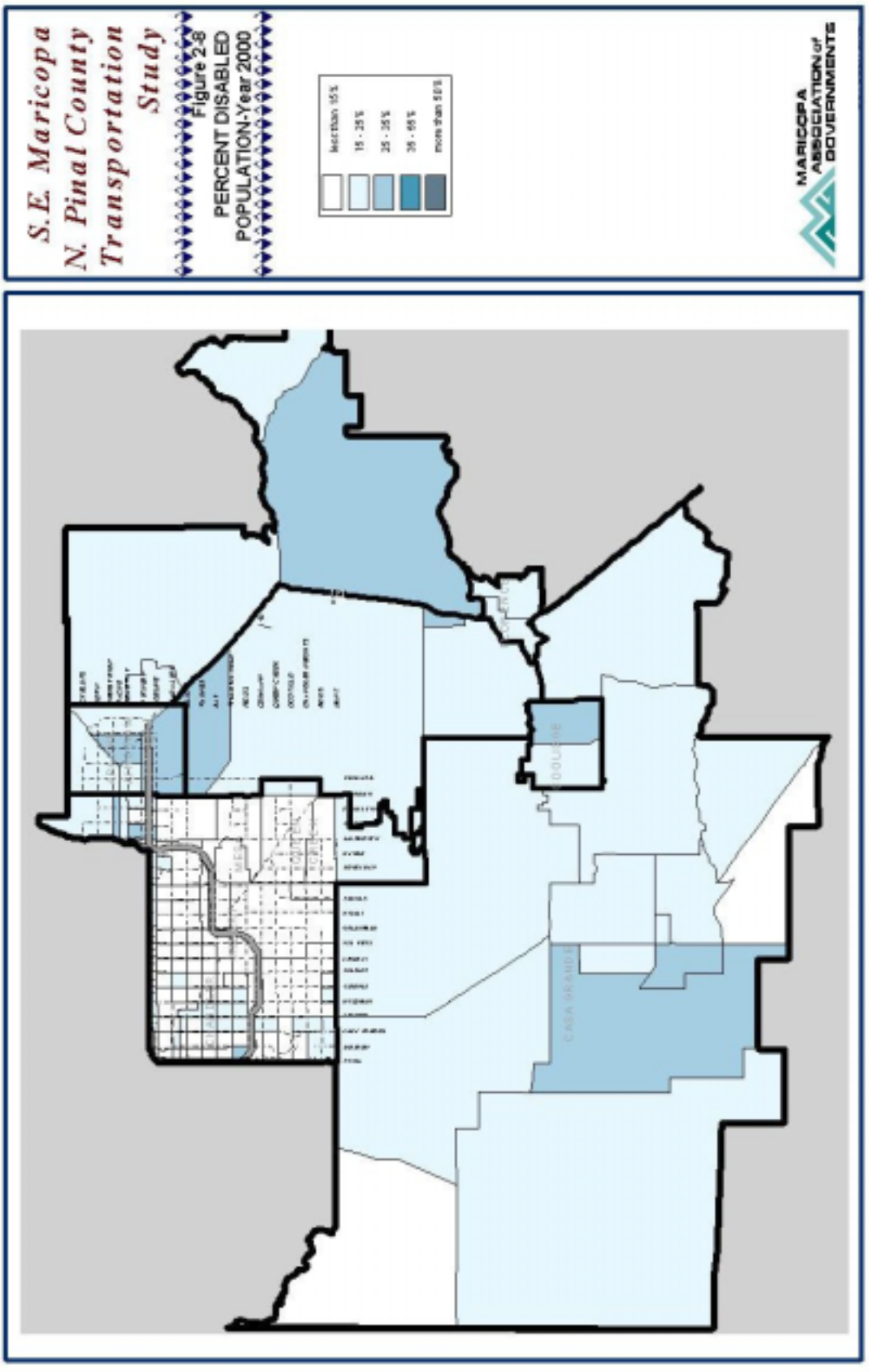
The highest concentrations of population over age 60 occur south of US 60 in Pinal County, east of SR 79, in the Sun Lakes area, and Leisure World.

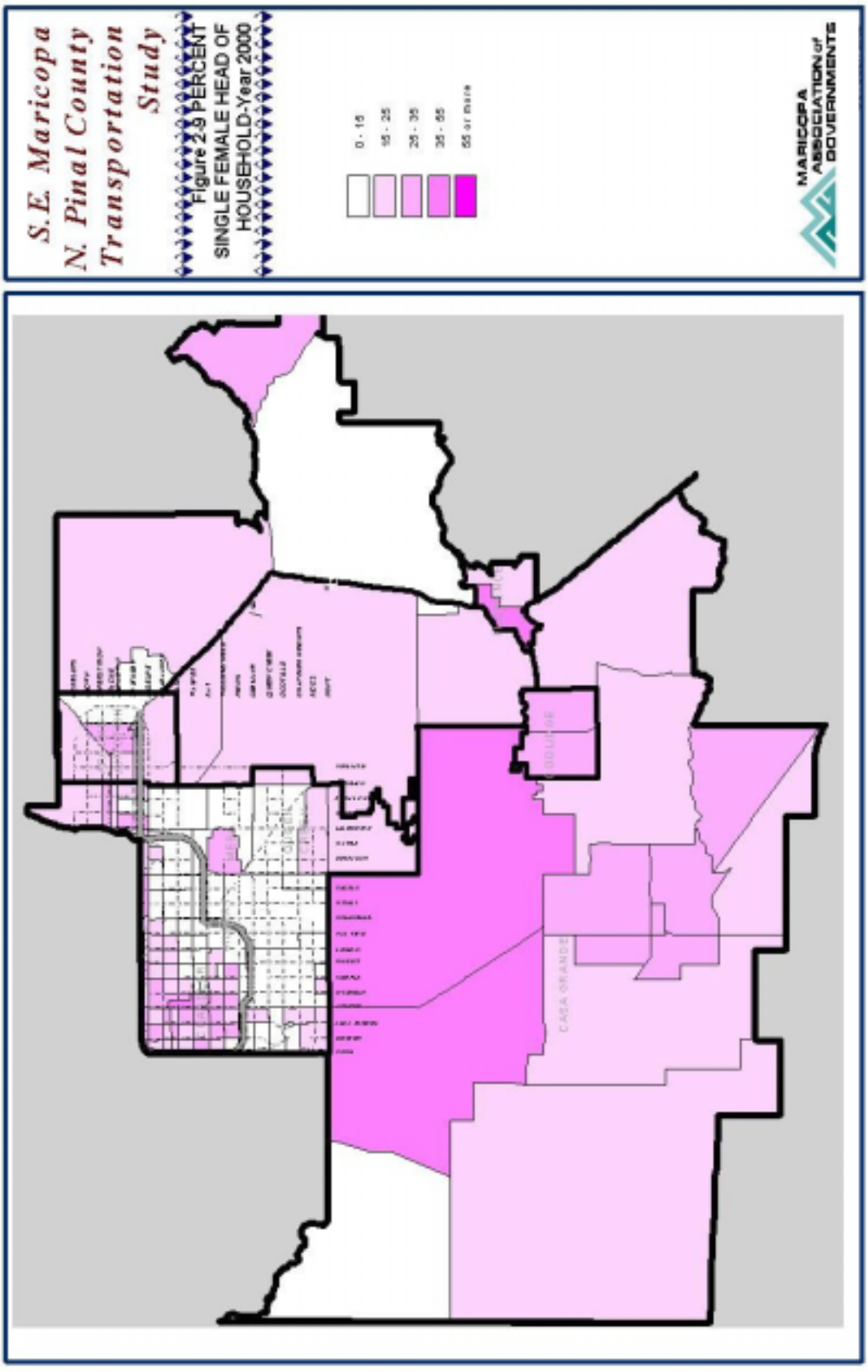
The majority of the study area has less than 15 percent of the population at the poverty level. However, there are areas where 35 percent or more of the population are at the poverty level. This includes much of the Gila River Indian Community and an area south of Casa Grande.

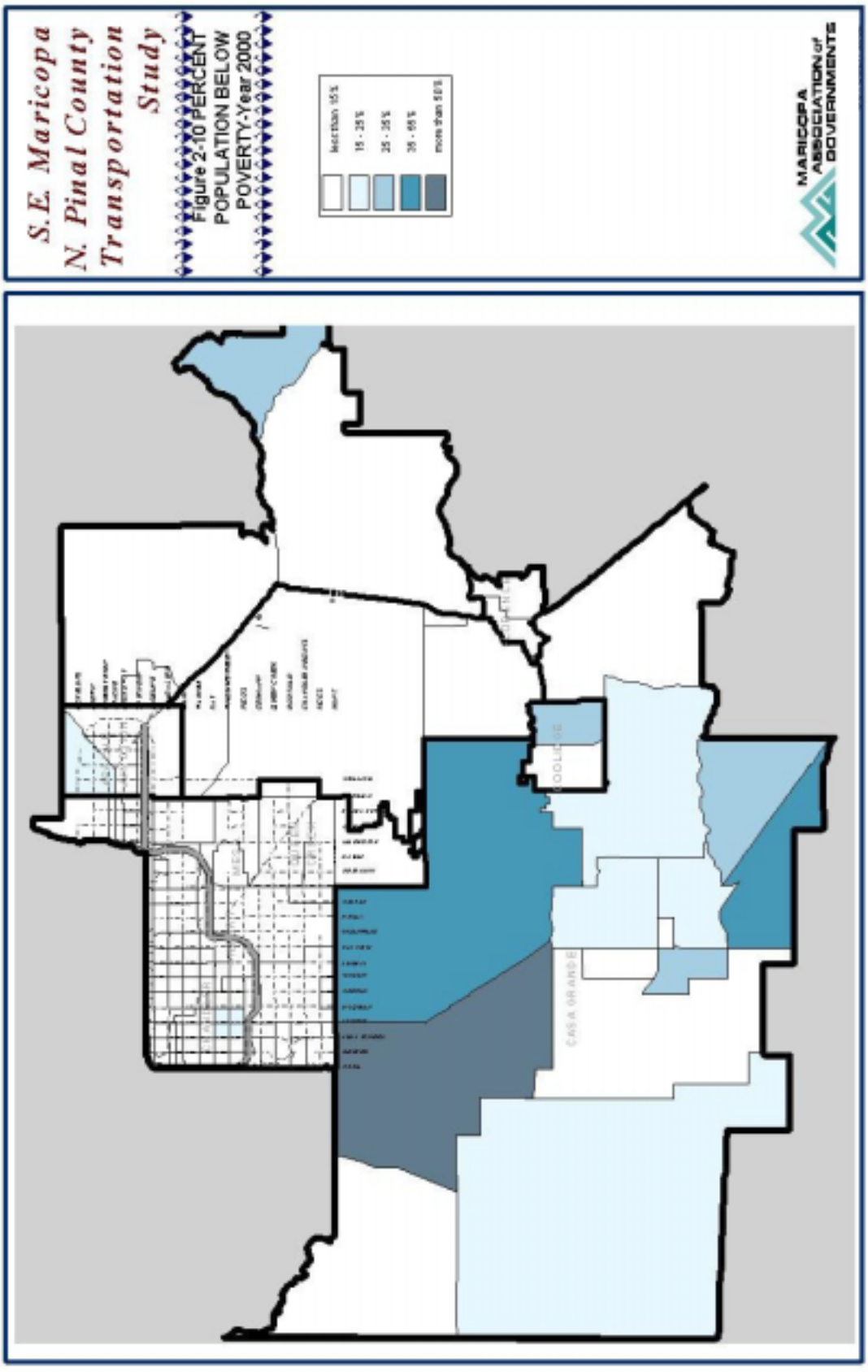
Figures 2-7 through 2-11 demonstrate that that there are areas within the study area that have high percentages of the populations protected under Title VI. As alternatives are developed and evaluated during the study, impacts to these populations are considered. The evaluation helps to ensure that these populations are not disproportionately adversely affected by the recommendations in the Southeast Maricopa/Northern Pinal County Area Transportation Study.

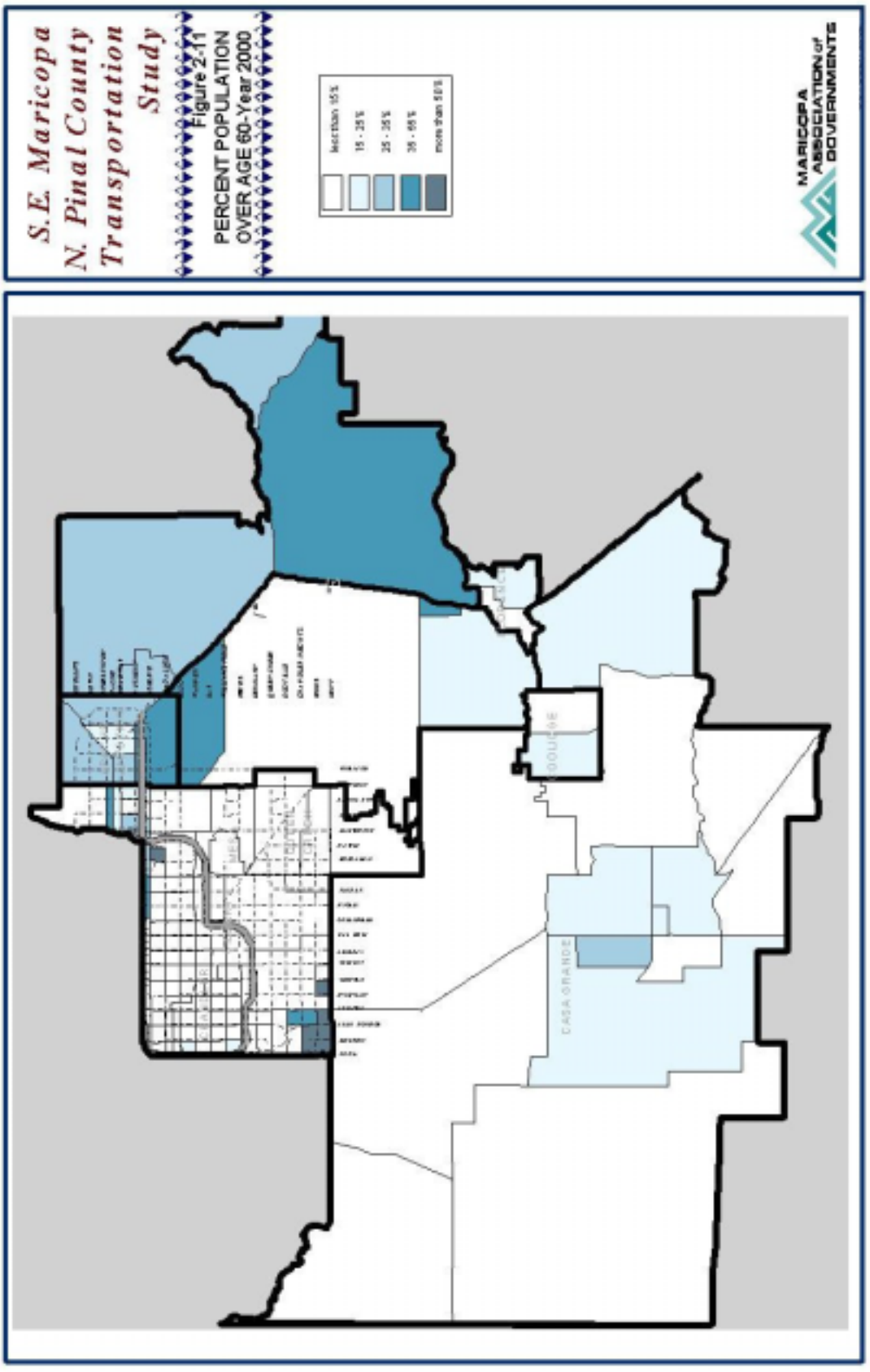
This study is intended to improve mobility, which will serve and benefit the residents of the study area regardless of their census population classification.


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-7
PERCENT MINORITY
POPULATION-Year 2000
less than 15%
15 - 25%
25 - 35%
35 - 65%
more than 65%
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-8
PERCENT DISABLED
POPULATION-Year 2000
less than 15%
15 - 25%
25 - 35%
35 - 55%
more than 55%
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2.9 PERCENT
SINGLE FEMALE HEAD OF
HOUSEHOLD-Year 2000
0 - 15
15 - 25
25 - 35
35 - 55
55 or more
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-10 PERCENT
POPULATION BELOW
POVERTY-Year 2000
less than 15%
15 - 25%
25 - 35%
35 - 55%
more than 55%
MARICOPA
ASSOCIATION of
GOVERNMENTS
COOLIDGE
CASA GRANDE


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 2-11
PERCENT POPULATION
OVER AGE 60-Year 2000
less than 15%
15 - 25%
25 - 35%
35 - 45%
more than 45%
MARICOPA
ASSOCIATION of
GOVERNMENTS
CASA GRANDE

3.0 EXISTING TRANSPORTATION SYSTEM

The review and analysis of existing conditions allows for the identification of existing problem areas and provides background for the analysis of future conditions. This chapter provides a discussion of the multi-modal transportation facilities in the study area including roadways, public transit services, bicycle and pedestrian facilities, and intermodal terminals.

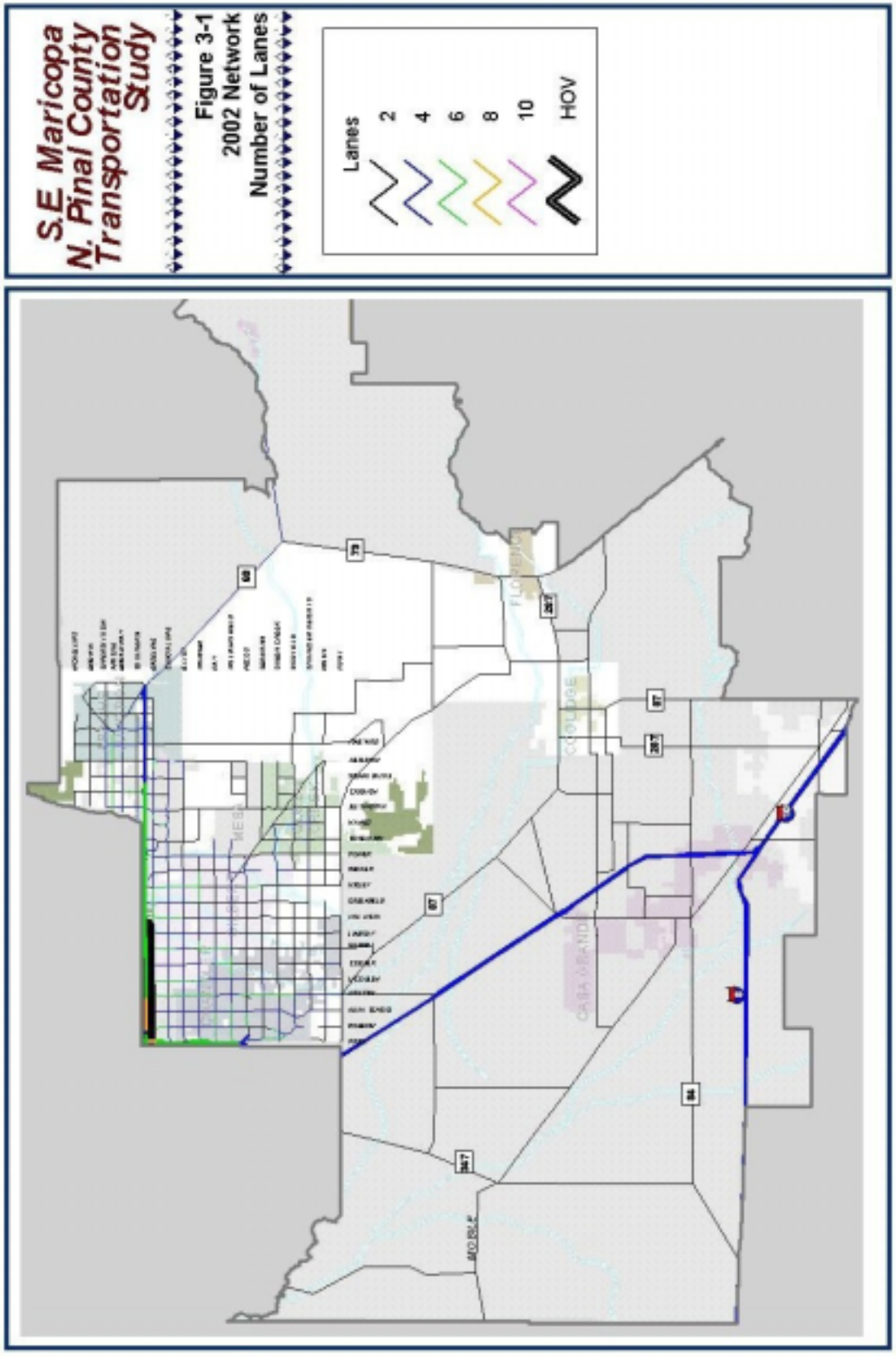
a. Roadways

A variety of roadways serve the study area including interstate, state highways, county highways, major arterials within the developed areas, and local roads. The roadways vary from two-lane unpaved roads to six-lane arterials with curb and gutters to interstate freeways with full access control. In general the interstate and state highways carry the longer trips in the area and serve to connect the communities and major activity centers. The major arterials, which are continuous and extend several miles, carry local traffic within as well as regional traffic between communities. The arterials in the developed areas generally follow a grid pattern of east-west and north-south streets at mile intervals. East of Power Road, the grid system is not yet complete, especially in the Northern Pinal County area, but is expected to continue as development occurs. However, Northern Pinal County is served by US 60, a four-lane divided highway; SR 79, Hunt Highway, and Ironwood Road, all of which are two-lane roads.

Key characteristics of the roadways serving area traffic include number of lanes, functional classification, ITS implementation, average daily traffic (ADT), person trips, vehicle miles of travel, speeds, and level of service. Using data provided by the jurisdictions and MAG, these characteristics were reviewed and are described in the following sections.

Number of Lanes

The number of lanes provided on the roadways in the study area varies from five through lanes in each direction to one through lane in each direction. The existing number of through lanes is shown in Figure 3-1. As shown in the figure, the majority of the roadways in the study area provide two or four through lanes. The six-lane


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 3-1
2002 Network
Number of Lanes
Lanes
2
4
6
8
10
HOV

arterials are in the northern portion of the study area, covering the developed areas of Maricopa County.

On some routes, the number of through lanes varies within a mile depending on adjacent developments. It should be noted that the number of lanes at individual intersections also varies. Turn lanes may have been constructed to include a single left turn lane, double left turn lanes, and/or separate right turn lanes.

A roadway system can be measured in terms of centerline miles and lane miles of roadway. The number of centerline miles and lane miles by jurisdiction in the study area are summarized in Table 3-1.

TABLE 3-1
CENTERLINE MILES AND LANE MILES BY JURISDICTION (2002)[1]

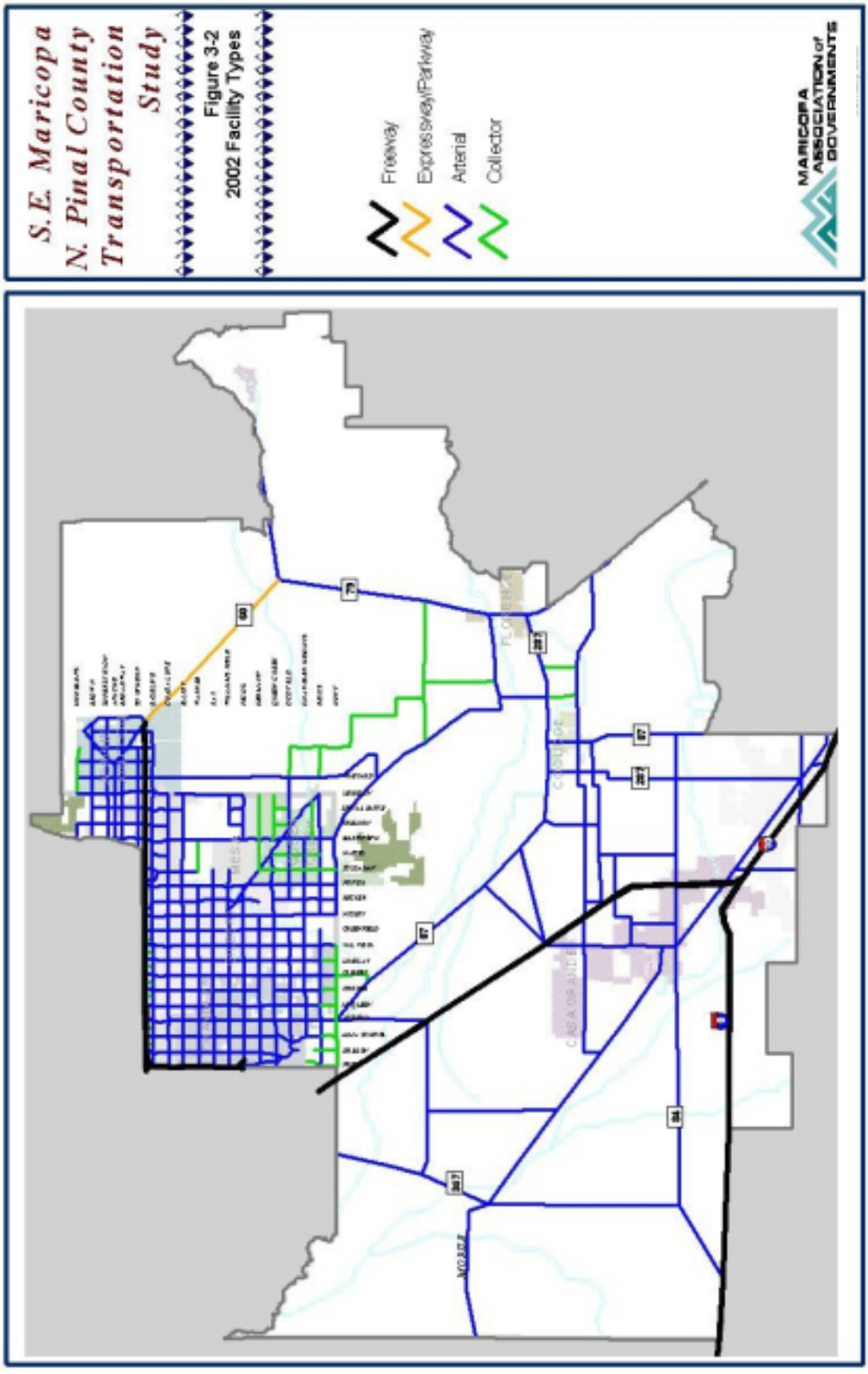
JURISDICTION[2]	CENTERLINE MILES	LANE MILES
Apache Junction	55	150
Chandler	173	647
Gilbert	166	583
Mesa	112	371
Queen Creek	40	85
Coolidge & Florence	67	134
Northern Pinal County	54	152
TOTAL	**667**	**2122**

[1] *data represents miles within focus area*
[2] includes surrounding unincorporated area

Facility Types

Facility type defines the hierarchy of streets in a roadway system for use in the travel-forecasting model. The classifications used in the study are freeway, expressway, arterial, and collector. In general, the freeways and expressways provide a high level of mobility for the traveling public, while the arterials provide mobility and limited land access and collectors provide for land access. It should be noted that the facilities in these classifications do not necessarily correspond to federal classification systems.

The facility type assigned to the roadways in the study area is shown in Figure 3-2. In general, the majority of the streets shown in the study for analysis are classified as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N. Pinal County
Transportation
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Figure 3-2
2002 Facility Types
Freeway
Expressway/Parkway
Arterial
Collector
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arterial streets. These facility types could change over time as the area develops in the future.

The amount of the various types of roadways in the study area is expressed in terms of centerline miles and lane miles. The miles of roadways are summarized in Table 3-2.

TABLE 3-2
CENTERLINE MILES AND LANE MILES BY FACILITY TYPE (2002)[1]

FACILITY TYPE	CENTERLINE MILES	LANE MILES
Freeway & Expressway	53	263
Arterials	614	1859
TOTAL	**667**	**2122**

[1] *data represents miles within focus area*

ITS Implementation

Intelligent transportation system (ITS) strategies employed in the study area include signal systems and the implementation of AZTech.

In the study area, Mesa, Chandler, and Gilbert have computerized signal systems, which are operated independently by each city. The MAG ITS Strategic Plan encourages signal coordination across jurisdictional boundaries. The cities provide information to the regional traffic operations center at Maricopa County that can be shared with other cities and the State for incident identification and response, as well as set the groundwork for inter-jurisdictional coordination of signals.

AZTech is a partnership of public and private organizations working to integrate travel and communications systems in the MAG urban area. AZTech provides motorists with information such as real-time traffic conditions, road closures, and accident locations. There are three phases to implementation. Phases I and II are complete. Phase I included providing travelers and commuters with information on the internet (using portals such as MSN and MapQuest) and with personalized travel information using personal digital assistant (PDA) and in-vehicle services (e.g. GM Onstar). In addition, 27 traveler information kiosks have been set up for public use in shopping malls, libraries, and public buildings. Phase II increased the Internet capabilities of the project and tested new technologies.

In 1991, ADOT opened its Traffic Operations Center to serve as the control center for the freeway management system. The system includes a variety of components including ramp meters, closed circuit TV cameras, loop detectors, variable message signs, passive acoustic detectors, communication systems, computer systems, and simulcast radio. Within the study area, there is currently ramp metering in place on US 60 and I-10 north of Ray Road.

Average Daily Traffic

Several of the jurisdictions in the study area conduct traffic count programs on their major streets. The counts, which are collected over a twenty-four hour period, provide valuable information about travel patterns within a community including daily traffic, peak hour data, and the directional distribution of traffic on the roadways. Mesa, Chandler and Gilbert have on-going traffic count programs. For other communities, the latest information was obtained from MAG, Maricopa County, Pinal County and ADOT as available.

Daily traffic volumes for the arterial streets in the study area are shown in Figure 3-3. The highest volumes shown are on arterial streets in the northern portion of the study area with average daily traffic of 40,000 to 50,000 vehicles per day on some segments. Existing daily traffic volumes on the freeway system are presented in Figure 3-4. The highest freeway volume in the study area is 176,000 vehicles per day on US 60 between Country Club and Mesa Drive.

Vehicle Miles of Travel

Vehicle miles traveled is the average daily traffic (ADT) for a roadway segment multiplied by the length of the segment. In general, if development is spread out over a large area, the vehicle miles traveled per person tends to be higher because people have to travel farther to reach their destinations. In an area where the development is more concentrated, the trips tend to be shorter and vehicle miles traveled per person is less.

The vehicle miles traveled for roadways in the study area is listed in Table 3-3 by type of roadway.

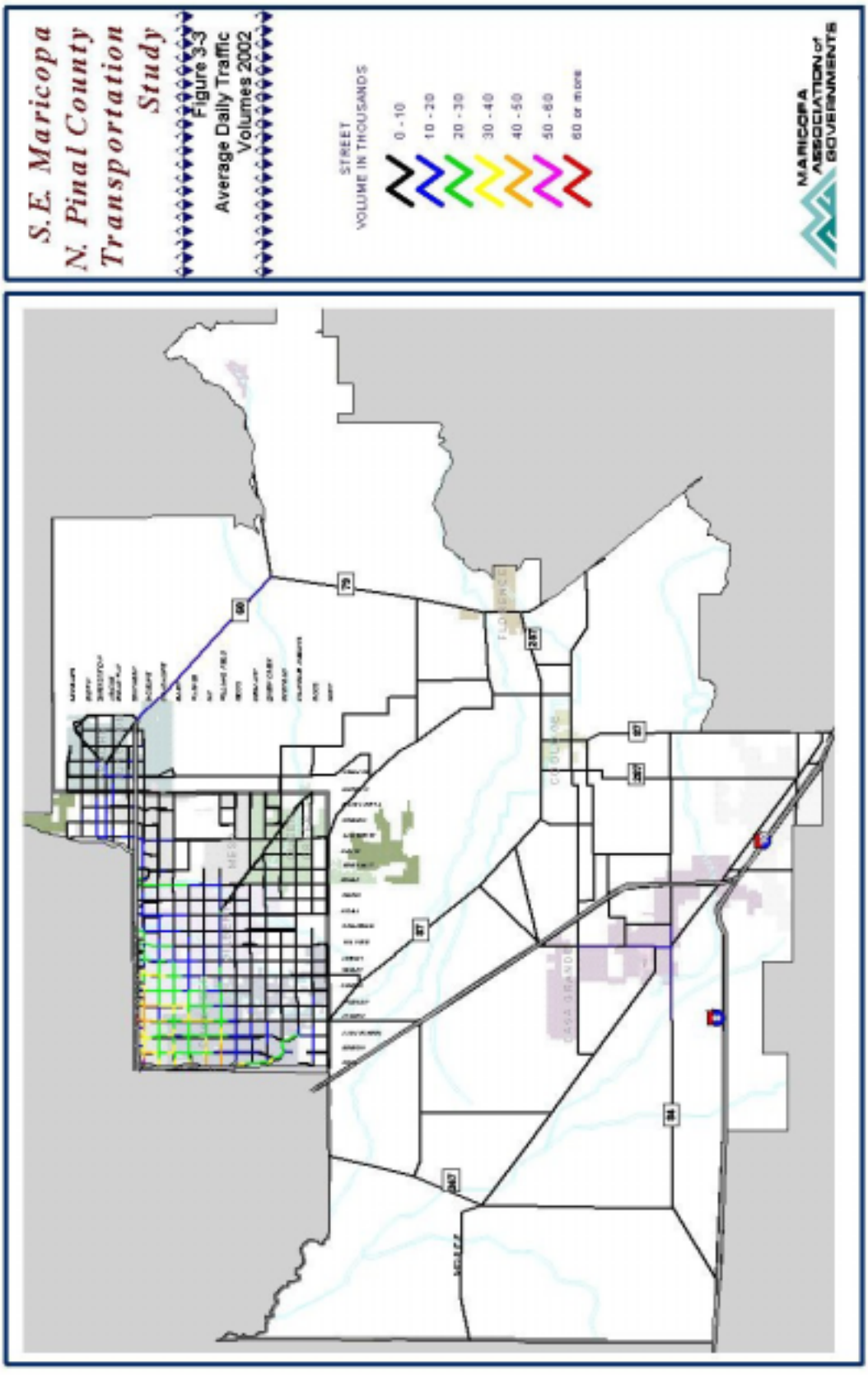
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Figure 3-3
Average Daily Traffic
Volumes 2002
STREET
VOLUME IN THOUSANDS
0 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 - 60
60 or more
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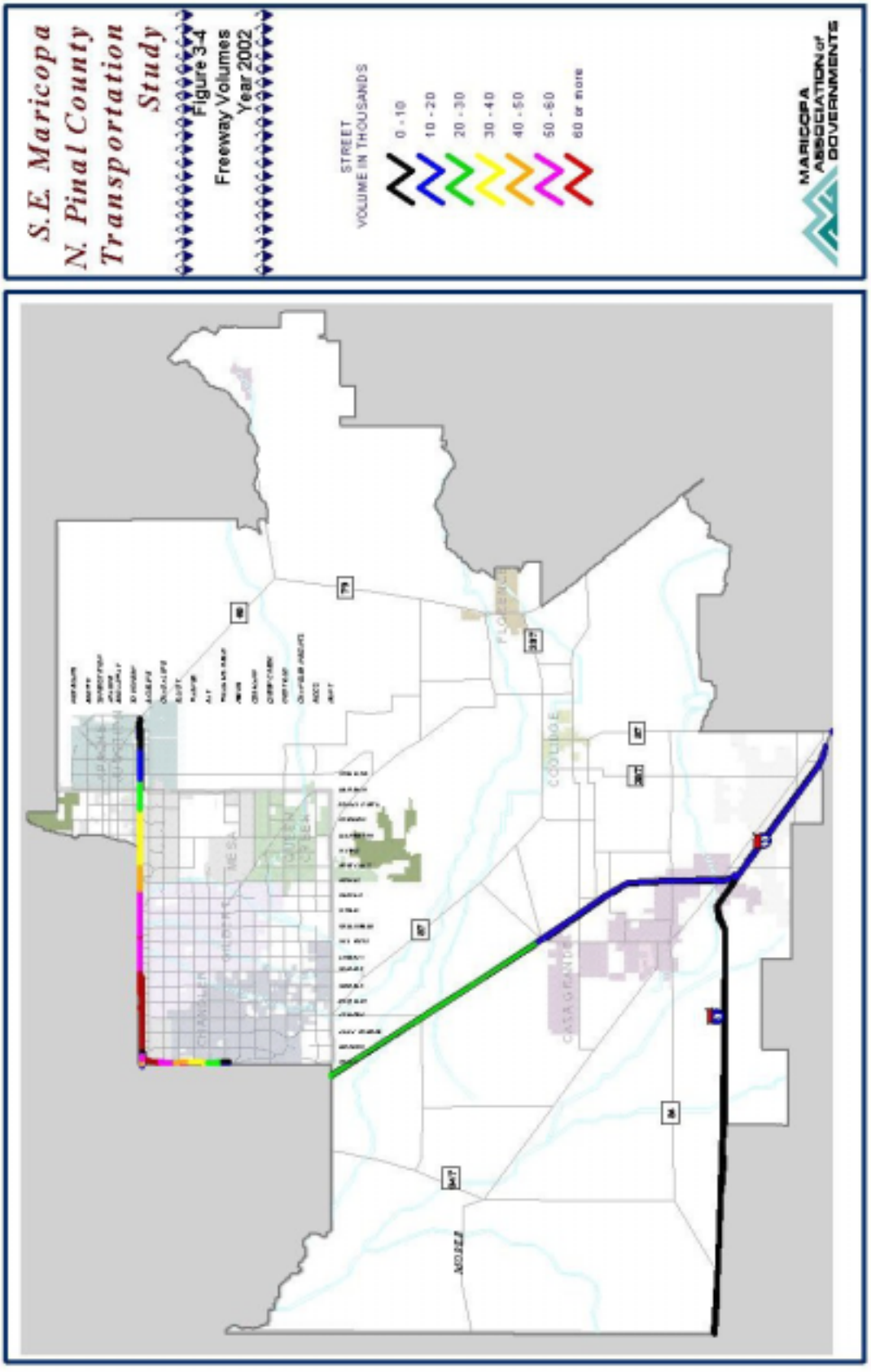
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Transportation
Study
Figure 34
Freeway Volumes
Year 2002
STREET
VOLUME IN THOUSANDS
0 - 10
10 - 20
20 - 30
30 - 40
40 - 50
50 - 60
60 or more
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TABLE 3-3
VEHICLE MILES OF TRAVEL BY TYPE OF ROADWAY (2002)[1]

FACILITY TYPE	VMT
Freeways & Expressways	4,470,800
Arterials	7,407,900
TOTAL	**11,878,700**

[1]*data represents miles within focus area*

The vehicle miles traveled for roadways in the study area is listed in Table 3-4 by jurisdiction. For the study area, the jurisdictions with the highest vehicles miles of travel are Chandler and Gilbert with over 5 million and 3 million VMT respectively. Mesa is listed at 1.5 million VMT because only a portion of the city is in the study area.

TABLE 3-4
VEHICLE MILES TRAVELED BY JURISDICTION (2002)[1]

JURISDICTION[2]	VMT
Apache Junction	540,700
Chandler	5,030,200
Coolidge & Florence	498,700
Gilbert	3,261,400
Mesa	1,531,500
Queen Creek	153,600
Northern Pinal County	862,600
TOTAL	**11,878,700**

[1]*data represents miles within focus area*
[2]*includes surrounding unincorporated area*

Speeds

The speed limits on area roadways are posted by the agency, which owns the road. In general, the higher speeds (above 55 mph) are posted on the state highways and the interstate. On Interstate 10, the speed limit varies from 75 mph to 65 mph to 55 mph within the urbanized area. The current speed limits on the major roads are presented in Figure 3-5. The majority of the roadways in the study area are in the 25 mph to 45 mph range.

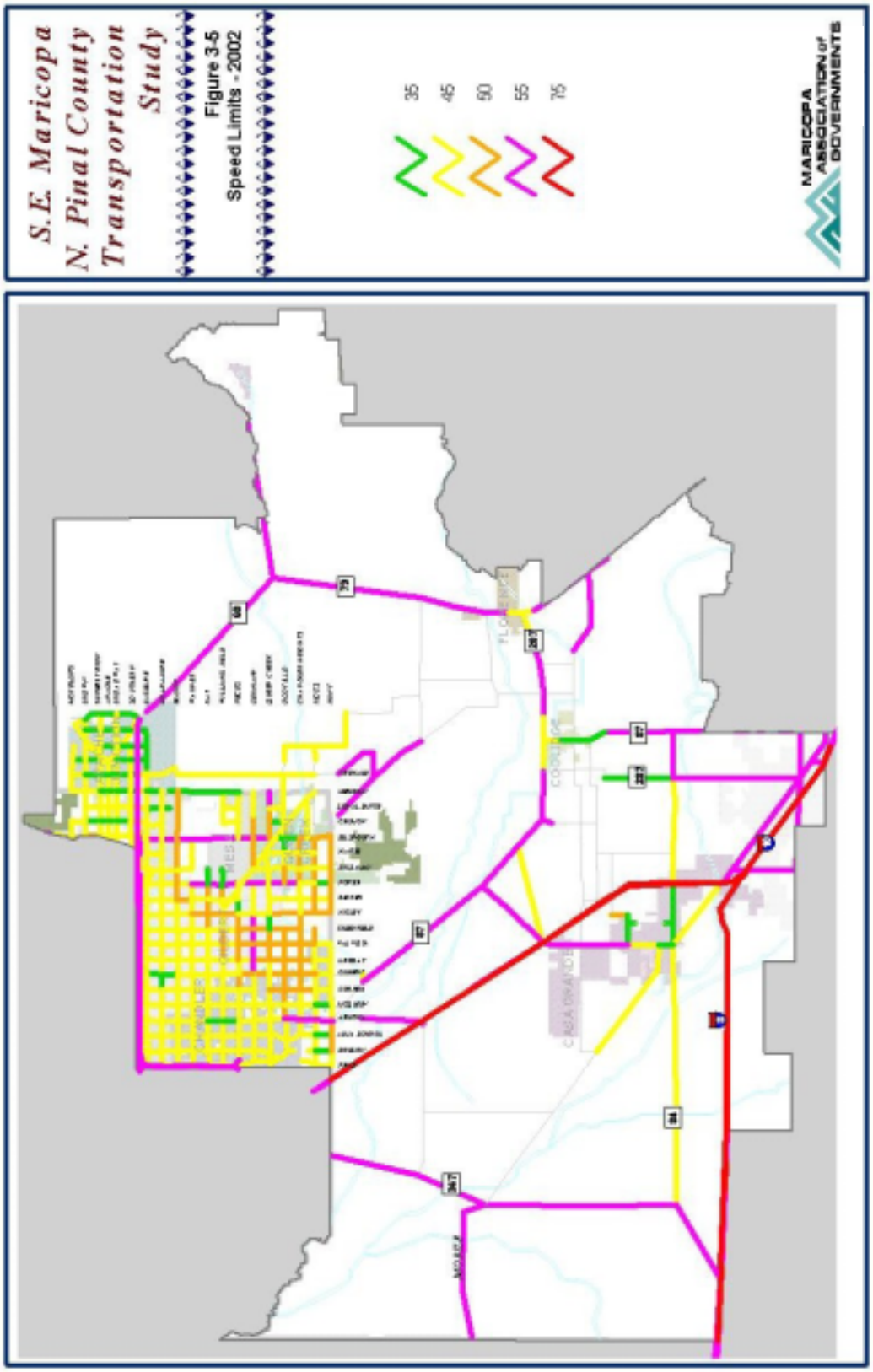
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Figure 3-5
Speed Limits - 2002
35
45
50
55
75
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Accident Data

Accident statistics were obtained from the report, Arizona Motor Vehicle Crash Facts, 2000. The report is published annually by the Traffic Engineering Group of ADOT. The results are compiled from Arizona Traffic Accidents Reports submitted to ADOT by state, county, city, and other law enforcement agencies.

During the year 2000, there were an estimated 131,368 reported traffic accidents in the state of Arizona. Of this total, 86,688 or 66% were in Maricopa County and 2,912, or 2%, were in Pinal County. The number of fatal accidents in Maricopa County was 394, which is less than 1% of the total in the County. In Pinal County, 64 of the accidents were fatal accidents or approximately 2% of the total.

Statewide, the crash rate per 100,000 people was 2,561 for the year 2000. In Maricopa County, the rate is 2,822 per 1000,000 people and in Pinal County the rate is 1,620. For the study area, the number of crashes and the number of people killed or injured is shown in Table 3-5.

TABLE 3-5
YEAR 2000 CRASH FACTS FOR CITIES IN THE STUDY AREA*

CITY	TOTAL CRASHES	NUMBER OF CRASHES			NO. OF PERSONS	
		Fatal	*Injury*	*Property Damage*	*Killed*	*Injured*
Apache Junction	331	3	100	228	3	152
Chandler	3,056	4	994	2,058	4	1,571
Coolidge	82	0	26	56	0	33
Florence	60	1	11	48	1	23
Gilbert	1,352	7	419	926	7	624
Mesa	11,019	30	3,558	7,431	33	5,475

*Source: Arizona Motor Vehicle Crash Facts, 2000; Arizona Department of Transportation

b. Public Transit

The focus of this section is to describe existing public transit services within the study area. The majority of transit service in the Southeast Maricopa/Northern Pinal County Area Transportation Study area is provided under the Valley Metro umbrella by Mesa,

Chandler, and Gilbert. Smaller, more specialty services are provided by Maricopa County, Coolidge, and employers such as the Arizona Department of Corrections.

Historically, the area has had limited transit service which was primarily utilized by the transit dependent population. However, the area has changed enormously over the last decade. Historical agricultural areas have been replaced by the rapid urbanization and expansion of residential, commercial, and employment land uses. As a result, more cities have put in place transit service improvements as their population and employment increase.

From 1992 to 2002, Valley Metro ridership has increased from about 32 million passenger boardings in 1992 to more than 44 million passenger boardings in 2002. A significant portion of this increase has resulted from the expansion of transit services in the Maricopa County portion of the study area.

The fixed route system has expanded primarily along the arterial grid network, and the formation of the East Valley Dial-a-Ride in 1999 has hastened paratransit travel across city borders. Express transit services, funded primarily through the 1985 Regional Area Road Fund (RARF), connect outlying residential areas with major regional employment centers such as downtown Phoenix and Tempe. Figure 3-6 documents the extent of existing fixed route transit services within the study area.

For the most part, there is limited service in Northern Pinal county, with the exception of Coolidge and some scattered vanpool service. The communities of Casa Grande, Florence, and Apache Junction do not have organized city-sponsored transit services. Table 3-6 presents a summary of the existing transit services in the study area followed by a discussion of the services.

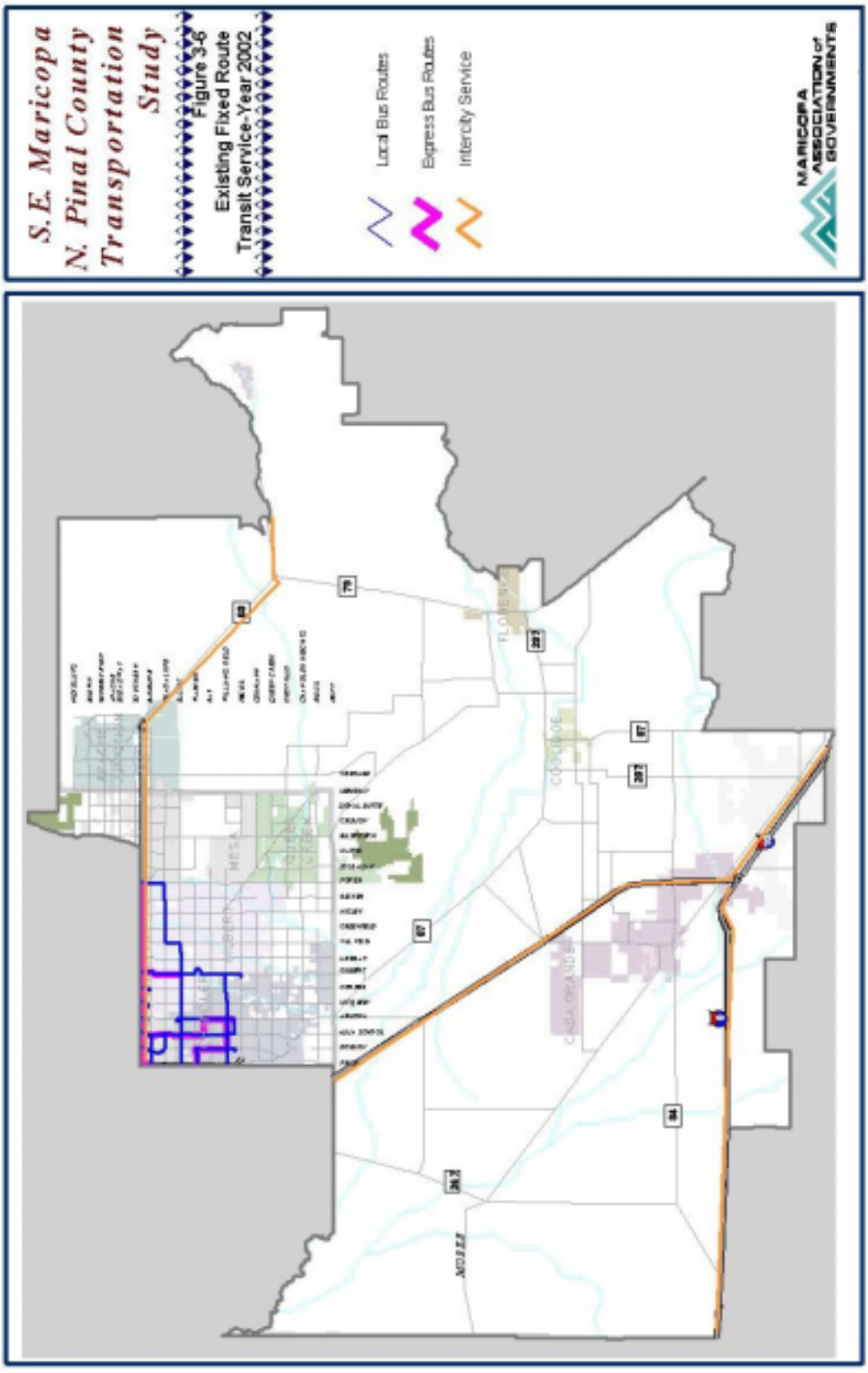
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Figure 3-6
Existing Fixed Route
Transit Service-Year 2002
Local Bus Routes
Express Bus Routes
Intercity Service
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TABLE 3-6
EXISTING TRANSIT SERVICES IN STUDY AREA (2002)

Jurisdiction	Existing fixed route transit services?	Existing dial-a-ride or paratransit service?	Adopted transit services plan?
Apache Junction	No	No	No
Casa Grande	No	No	No
Chandler	Yes	Yes	Yes
Coolidge	Yes	Yes	Yes
Florence	No	No	No
Gila River Indian Community	No	No	No
Gilbert	Yes	Yes	Yes
Mesa	Yes	Yes	Yes
Pinal County	No	No	No
Queen Creek	No	No	No
Superior	No	No	No
Maricopa County	No	Yes	Yes

Fixed Route Service

Fixed route service is the most common transit service in the region. Generally, it uses standard size transit vehicles and is characterized by busses operating along the arterial streets.

Mesa

Currently, there are twelve local routes and four express routes that operate in Mesa. In general, the local routes operate on weekdays from 5 a.m. to 10 p.m. with 30-minute frequency and on Saturday from 5 a.m. to 10 p.m. with 30 to 60 minute headways. There is no Sunday service. In FY 1999-2000, public transit carried over 1,000,000 passengers in Mesa.

Chandler

Currently Chandler operates seven local routes and two express routes. Local service is provided primarily north-south along the major arterial streets and operates between 5-6 days a week from approximately 5:30 a.m. to 6:30 p.m. Service on route 104 operates until 10:15 p.m. Overall headways range from 15-30 minutes in the peak period to 30-60 minutes in the off-peak period. There is no Sunday service.

Coolidge

The City of Coolidge operates the Cotton Express, a local circulator route that provides a fixed/deviated route public transportation service on two separate but connecting routes. Regular stops on the fixed routes are served at scheduled times. Passengers can transfer from one route to the other at local commercial centers within the City of Coolidge. The bus, when dispatched, will deviate from the fixed route to provide door-to-door service for the disabled or elderly rider (60 years and older). Transit services are fully accessible to persons with disabilities. In FY2001 the service provided 22,522 passenger trips and provided 54,373 miles of revenue service.

The inner route service runs continuously throughout the day within the City Limits of the City of Coolidge, while the outer route provides service to an unincorporated area directly south and west of the city limits within 10 miles of the municipal boundaries.

Gilbert

Currently Gilbert lies on the outer edge of the Valley Metro grid-based transit system and has two local routes and one express. Local service is limited to one north-south route and one east-west route. Route 136 starts at the Gilbert-Chandler community college and provides service along Gilbert Road. Route 108 provides service along Elliot and Guadalupe roads. Service is provided six days a week at approximately 30-minute headways.

Pinal County

The Pinal Gila Community Child Services operates a transit service called Community Transportation throughout a portion of Pinal County. Community Transportation provides fixed/deviated route public transportation service in Casa Grande, Coolidge, Eloy, and Florence. There are three fixed routes: 1) Casa Grande to Central Arizona College, 2) Eloy to Toltec to Casa Grande, and 3) Florence to Coolidge to Central Arizona College. The vehicles operate from 5:00 a.m. to 7:00 p.m., Monday through Friday. Several stops are provided on the routes at scheduled times according to the published route maps. Passengers can transfer from one route to another. The bus will deviate from the fixed route to provide door-to-door service with an advanced reservation. Total ridership for fiscal year 2001/2002 was 23,159 passengers, with the highest monthly ridership of approximately 3,200 passengers in August.

Express Bus

Express bus service provides transportation for commuters during the peak hours connecting suburbs with high employment areas. Express bus routes have fewer stops than traditional fixed route service and often use freeway corridors.

In Mesa, the express bus service operates in the morning and evening peak hours and provides connections between Mesa and downtown Phoenix. Express bus service in Chandler connects Chandler with downtown Phoenix five days a week, with total trips ranging from 8-10 per day equally divided in the a.m. and p.m. peak periods. In Gilbert, the express route starts at Gilbert/Elliot and connects Gilbert to Mesa and downtown Phoenix. Five trips are provided during each a.m. and p.m. peak.

Paratransit

Paratransit services provide transportation for people who cannot access fixed route service including seniors and passengers with disabilities.

There are two paratransit services available in Mesa: East Valley Dial-a-Ride and the Enabling Transportation program. The East Valley Dial-a-Ride is a partnership of the cities of Mesa, Chandler, Tempe, and Scottsdale, the Town of Gilbert, and RPTA. The East Valley Dial-a-Ride provides services for ADA-certified passengers, seniors, and passengers with disabilities. In Mesa, Dial-a-Ride service operates from 7 a.m. to 7 p.m. on weekdays, weekends and holidays. Extended hours are available for individuals who qualify under ADA. Between November 1999 and July 2000, the East Valley Dial-a-Ride carried approximately 171,000 passengers, of which 89,000 were in the City of Mesa.

The City of Mesa Enabling Transportation Program is provided in partnership with the Mesa Senior Services, Inc. It is a volunteer-based program designed to serve the elderly and disabled adult residents in Mesa. The participants are provided a mileage reimbursement to pay their driver.

The East Valley Dial-a-Ride provides paratransit service in the area. Service hours are from 7 a.m. to 7 p.m., and riders are required to book their trips at least one day in advance. Based on past ridership data about 8% of the daily riders on the system are from Chandler, totaling approximately 23,000 riders in FY2002.

Gilbert is also a member of the East Valley Dial-a-Ride organization, and service is provided from 7 a.m. to 7 p.m. Riders are required to book their trips at least one day in advance.

Maricopa County operates the Special Transportation Services (STS) program, a dial-a-ride service provided to the region's elderly, physically disabled, or low income (participants enrolled in the temporary assistance to needy families program TANF). In the recent past the STS service has expanded substantially as grant funding for TANF and other social service programs has been increasing. The service requires 24-hour advance reservations, but does accept standing reservations if rides are needed on a regular basis (for work-related trips).

Park and Ride Lots

Park and ride lots are provided throughout the urban area to enhance transit service and encourage carpooling. A park and ride lot is a transfer site for express bus passengers and for commuters who are sharing rides. In addition to parking spaces, some park and ride lots provide covered parking, passenger shelters, and bike racks.

Currently, there are 53 park and ride lots in the Phoenix metropolitan area including publicly owned lots and lots provided in conjunction with local businesses. Of these, six are located in the study area including three in Chandler, one in Gilbert, and two in Mesa.

Transit Connections

In the study area, Greyhound operates intercity bus routes on US 60 that connect Apache Junction with Phoenix and with Globe. Other cities served along the eastern route are Superior and Florence Junction. Gilbert and Mesa lie on the western route. Apache Junction has a Greyhound Ticket Center. Other intercity Greyhound routes connect Chandler with Phoenix and with Tucson. Bicycles may be shipped on Greyhound, provided they are in a bike box.

All Valley Metro buses have bike racks. Using the bus routes described in the previous section, cyclists can reach many destinations by combining bus and bike travel.

c. Non-Motorized

Non-motorized transportation facilities are intended for use by cyclists, pedestrians, and skaters. It is available to persons of all ages. This human-powered transportation

occurs on shared-streets, streets with bike lanes, streets marked as bike routes, sidewalks, pedestrian malls, multi-use paths (paved) and shared-use trails that are built on right-of-way separated from roadways.

People traveling by alternate modes do so for the same reasons people drive motor vehicles, for access to and from locations such as residential areas, schools, neighborhood shopping, public buildings, employment centers, concentrations of retail or tourist facilities, parks, regional recreational centers and trailheads, and historic or cultural attractions.

All streets in the study area, except limited access freeways, are open to cyclists and pedestrians. Therefore, the street grid always provides the basic access and connections for bicycle and pedestrian travel.

Outside of the incorporated areas, the study area is largely undeveloped and the number of miles of paved streets in the undeveloped areas are low; however, there is an extensive network of dirt/gravel roads, canal banks, and dry washes that can be used by pedestrians, equestrians, and bicyclists.

Definitions

In general, facilities for non-motorized travel are identified according to use and location within the right of way. Definitions for the types of facilities taken from the 1999 AASHTO "Guide for the Development of Bicycle Facilities" are presented below.

> Bicycle Facility. A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.
>
> Bicycle Lanes: A portion of a roadway, which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.
>
> Bicycle Route System: A system of bikeways, designated by the jurisdiction having authority, with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways.
>
> Bikeway: A generic term for any road, street, path or way, which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are

designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Shared Use Path: A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.

Pedestrian Facilities: Physical infrastructure that support walking as a stand-alone mode of travel, or support walking between origins and destinations such as a transit hub.

Shared Roadway: A roadway which is open to both bicycle and motor vehicle travel.

Nodes and Destinations

Typical regional origins for non-motorized travel will be population centers, residential areas, transit stations, resort areas, or access points for backcountry travel.

Destinations for non-motorized travel include schools, employment centers, concentrations of retail or tourist facilities, regional recreational centers and trailheads, and historic or cultural attractions.

In the study area, there are origin/destination pairs present in both the urban and rural areas, with the urban routes linking identified pairs. In some cases, the routes have been well developed by various jurisdictions. Between the major cities and the smaller rural towns there is usually only one main highway. Beyond those highways is a network of gravel/dirt or chip-seal roads.

Urban centers

Each of these areas serves as a potential origin for pedestrian and bicyclists, as well as potential destinations for pedestrian activity, cyclists, and equestrians.

- Apache Junction has a downtown area with sidewalks.
- Casa Grande has a very pedestrian friendly downtown area.
- The Chandler pedestrian area downtown is very well defined and pedestrians are well provided for. There are bicycle and pedestrian facilities of all types throughout the city. Most are very accessible.

- Coolidge's downtown area has no shoulder along the roadway, but continuous 5' sidewalks. There are no designated bicycle facilities.
- Eloy's downtown area has paved sidewalks, and paved shoulders, but no designated bicycle facilities.
- The downtown in Florence has continuous sidewalks, varying from 4' to 12' in width, and 10' shoulders on the main street edges. There are no designated bicycle facilities.
- Gilbert's downtown provides well for pedestrian and bicycle travel. There are also bicycle and pedestrian facilities throughout the city. Most are very accessible.
- The Mesa downtown area is not within the study area. Mesa has pedestrian and bicycle facilities throughout the city, in both the older and newer areas.
- Queen Creek is in the process of building a downtown area; the plans include pedestrian friendly walkways.
- Sun Lakes is a residential area, with a limited focus for pedestrian or bicycle activity. There are bike lanes on Alma School Road and Riggs Road.
- Superior has developed a pedestrian area on the Main Street and along the US 60. There are existing facilities such as a park and museum.

Existing Bicycle Facilities

The existing bicycle facilities in the study area are shown in Figure 3-7 and are described below. The facilities have been grouped according to the following three categories: 1) roadways, 2) off-roadways, and 3) transit connections.

Roadways

ADOT Policy is to allow bicycle travel on all roadway shoulders, except where expressly prohibited, generally in urban areas.

- Interstate 10 shoulders are closed to cyclists within the study area.
- US 60 shoulders are open to cyclists from Apache Junction to Superior.
- SR 79 between Florence Junction and Florence provides a route for cyclists with paved shoulders and no rumble strip.
- Other state highways in the study area open to bicycle travel are SR 87 (paved shoulders and no rumble strips south of Sacaton), SR 287 (paved shoulders and no rumble strips), SR 187, SR 387 (unpaved shoulders), SR 587, SR 347, and SR 238.

Within towns and cities, the arterial and collector streets provide the basic bicycle system. These roads currently have bike lanes throughout most of the study area; although in some cases, the lanes are not continuous: Guadalupe Road, Elliott Road, Dobson Road, and Alma School Road.

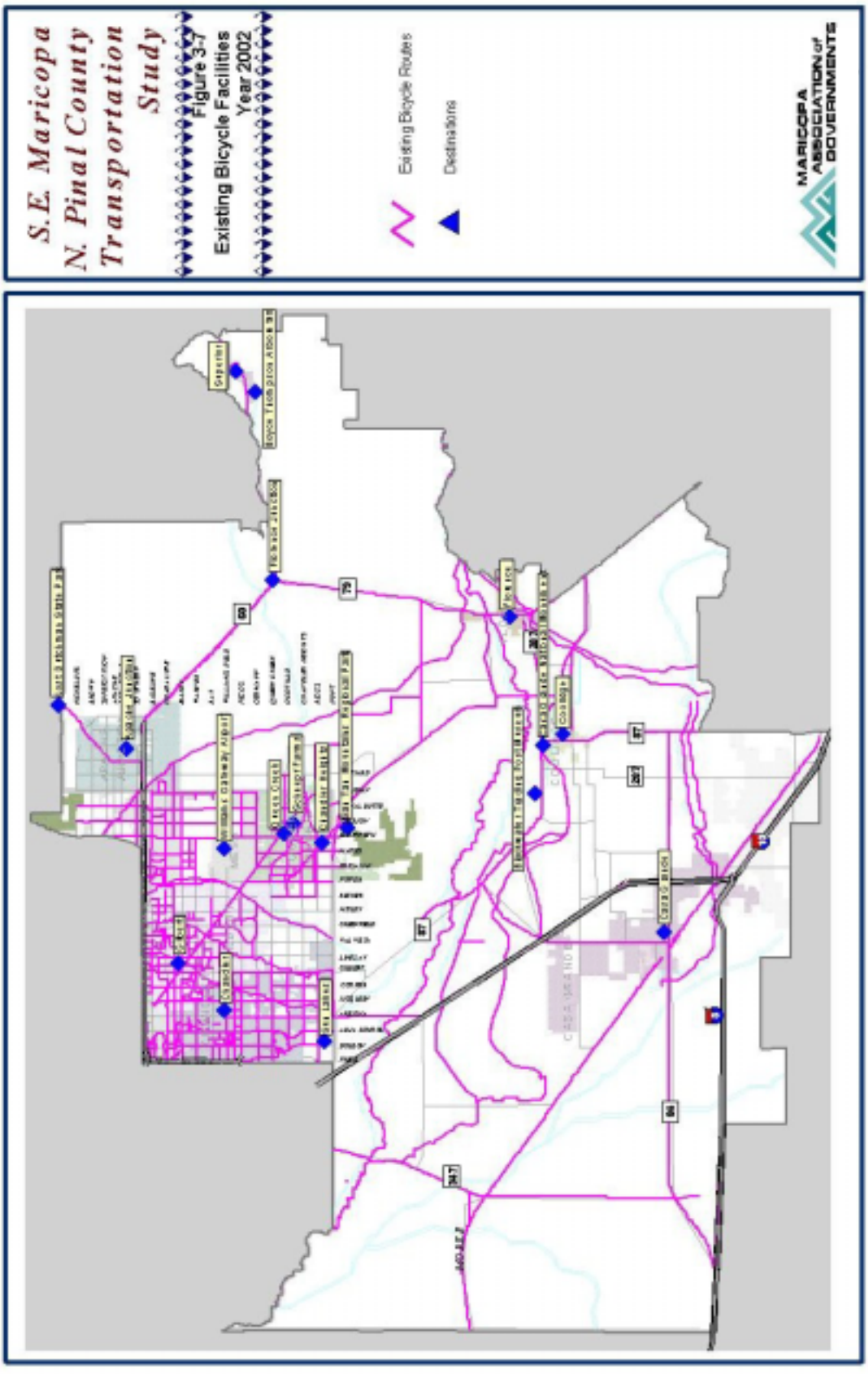
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Figure 3-7
Existing Bicycle Facilities
Year 2002
Existing Bicycle Routes
Destinations
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Between Florence and Coolidge there are connected, paved back roads, Kenilworth Road and Cactus Forest Road, that cover most of the distance.

Between the Chandler Heights and Queen Creek Area, a series of paved roads form a fairly direct route to the Florence/Coolidge area. Starting from the north end at Rittenhouse Road, a cyclist could follow Coombs Road, Skyline Drive, Quail Run Road, Judd Road, Attaway Road, Arizona Farms Road, and Hunt Highway.

Off-roadway

For equestrian and mountain bike use, hiking, jogging, and recreational walking, unpaved surfaces are preferred. Routes along corridors with unpaved shoulders on roadways, canal banks, utility corridors, natural washes, etc., can provide excellent routes for these users. The following are of particular interest in the study area:

Within the City of Chandler, there is a multi-use path on the bank of the Consolidated Canal. The Town of Gilbert is designing a paved multiuse path on their section of that canal.

Other canals that would be considered potential off-roadway facilities include Eastern Canal, Western Canal, Roosevelt Water Conservation District Canal, Florence Casa Grande Canal, Casa Blanca Canal, Southside Lateral, and the Santan Canal.

Watercourses such as the Gila River and Queen Creek are potential corridors for recreational activities.

The Central Arizona Project (CAP) Canal traverses the study area. Beyond the study area, it extends from the Colorado River to Tucson. However, it is fenced, and the banks are closed to public activity. The potential exists for a facility to be built adjacent to the fence. MCDOT is currently studying the feasibility and developing design guidelines for a multi-use path along the CAP from Lake Pleasant to Mesa.

No rail-to-trail conversions of abandoned railroad corridors were found in the SE Study Area.

Policies

Agencies and jurisdictions in the study area have policy and planning provisions for providing connections within their jurisdictions. A brief description of plans and policies is provided below.

Arizona Department of Transportation (ADOT)

ADOT Policy is to allow bicycle travel on all roadway shoulders, except where expressly prohibited, generally in urban areas. On the *Arizona Bicycle Map,* written by the Arizona Department of Transportation (ADOT) and the Governor's Bicycle Task Force, state and federal roads are identified as "more suitable" or "less suitable" for cycling. ADOT has a policy document, the *Arizona Statewide Bicycle/Pedestrian Plan,* which sets forth guidelines for bicycle planning.

Maricopa County

In the *Maricopa County 2020 Transportation System Plan, Eye to the Future*, the goal for County roadways and routes is to "provide an efficient, cost effective, integrated, accessible, environmentally sensitive, and safe countywide multi-modal system that addresses existing and future roadway networks as well as promotes transit, bikeways, and pedestrian travel."

The Maricopa County Department of Transportation (MCDOT) has developed standards for both urban and rural cross-sections with bike lanes.

The Maricopa County Department of Transportation (MCDOT*) Bicycle Transportation System Plan, 1999*, addresses all aspects of bicycles as a transportation element, including recommended improvements and a plan for a countywide bicycle network. Within the study area, the MCDOT Bicycle Plan designates certain sections as parts of a proposed bicycle network.

The Flood Control District of Maricopa County has recently been working on an Area Drainage Master Plan in the Higley area, and has planned or extended several trails/pathways through and within its boundaries. The Chandler Heights Basin is also a part of the study area, as documented in the Draft Report (2001).

Maricopa Association of Governments

The Maricopa Association of Governments (MAG) identifies off-street corridors suitable for multi-use paths such as canals, power line corridors, and river and wash corridors in the *Regional Off-street System Plan (ROSS), 2001* and *Phase 1, 2002* documents.

The MAG Regional Bicycle Plan, 1999, covers all aspects of planning for bicycling in the MAG region. A Regional Bikeway Plan on-road system inventory is presented,

including potential facilities and recommendations for widening and/or striping. In the study area the following have been identified:

- Route 16, Chandler Boulevard between McQueen Road and Gilbert Road.
- Route 20, Guadalupe Road from Power Road to Neely Street.
- Route 65, Lindsay from Williams Field to Elliott Road.
- Route 71, Power Road from Williams Field to Baseline Road.

Maricopa Association of Governments published their most recent Bikeways map in 2003. This map shows existing paved and unpaved multi-use paths, bike lanes with pavement markings, bike routes on streets, and edge striped facilities. It includes locations of underpasses and overpasses. A second MAG document, the Regional Bikeways Plan, published in 1999, shows an off-road system and an on-road system.

Pinal County

Pinal County's Transportation Plan (2000) incorporates a section on bicycle/pedestrian facilities. The policy calls for sidewalks and bike lanes on collectors and arterials. No mapping is included for these facilities.

The Pinal County Transportation Plan was updated in 2000. Cross-sections for principal arterials, minor arterials, and major collectors include bicycle lanes. The *Pinal County Five Year Transportation Program* was updated in 2001. This plan gives a priority list of highway improvement projects to be constructed.

Pinal County has a draft comprehensive plan that includes a transportation element. That element addresses all forms of alternate modes of travel. Objective T4 states: "Provide a balanced circulation system with opportunities for public transportation, pedestrian and bicycle circulation, equestrian trails and other alternatives to automobile travel".

Central Arizona Association of Governments (CAAG)

This regional planning agency has a Regional Transportation Plan that identifies deficiencies and recommends improvements for CAAG's transportation for the years 2003, 2008, and 2018.

Apache Junction

The Apache Junction General Plan includes a Parks and Recreation Master Plan (1999) that shows a system of off-road and on-street multi-use paths and trails that

connect to the Apache Trail and encircle the city. The intention is to provide links to the Tonto National Forest and natural areas for hiking and wilderness.

Casa Grande

This city completed a Multimodal Transportation Study in 2000.

Chandler

Chandler is currently updating its Long Range Plan for Bicycle Facilities. The stated goals of this plan are to improve bike facilities by providing bike lanes on all arterials, and most collectors, and to participate in regional off-roadway connections, such as the Paseo project, built along the Consolidated Canal.

Gilbert

Gilbert's Parks, Open Space and Trails Plan, adopted in 1996, recommended publication of a Parks and Trails Map, which was accomplished in 1998. Gilbert has also prepared a Canal and Transmission Easement Design Plan. This map shows multi-use trails, marked bike trails, and lanes, unmarked bike lanes, and proposed and existing horse trails. Gilbert plans to mainly develop their canals, transmission line easements and arterial streets.

Mesa

The City of Mesa prepared a Transportation Plan in 2002. The Plan is a mulitmodal plan that provides choices for travel and addresses all modes of travel including bicycle and pedestrian travel. According to the Plan, there are currently 70 miles of bike routes, 40 miles of bike lanes, and 2.25 miles of paved bike paths. The Plan identifies future facilities that extend the bicycle system in to the east and southeast portions of the City. When the implementation of the Plan is complete, there will be 109 miles of bike routes, 215 miles of bike lanes, and 65 miles of shared use paths across the City.

Queen Creek

Queen Creek's General Plan is currently a draft document (2002). This Plan has a Parks, Trails and Open Space Element, with a map of bicycle/pedestrian trails, equestrian trail, and on-road bike lanes. Also shown on the map are bike/pedestrian access areas, non-vehicular access areas, and equestrian access areas, and sections of trail and path types. Equestrian facilities that are separate from bike/pedestrian facilities are also shown.

Superior

The Town of Superior is currently implementing a plan to restore and manage their section of Queen Creek. The recreational aspect of this restoration delineates a trail along the creek.

d. Intermodal Facilities

An intermodal facility is a non-highway transportation facility or terminal. It is an element of the transportation system that accommodates and interconnects different modes of transportation and provides for the movement of people and goods.

The Union Pacific Railroad operates a freight line that extends through the study area from Eloy north through Queen Creek, Gilbert and Mesa and continuing into Phoenix. At Magma Junction, near Attaway and Arizona Farms, two short line railroads interconnect with the UP line. The Copper Basin Railway is a freight line serving the copper mines in eastern Pinal County. It provides connecting service between the Union Pacific and the San Manuel Railroad. The Magma Arizona Railroad is a freight line that extends from Magma Junction to Superior to serve the mines and two shippers.

Williams Gateway Airport, located east of Power Road and south of Ray Road, is a partnership of the City of Mesa, Town of Gilbert, Town of Queen Creek, and the Gila River Indian Community. The airport has both passenger and cargo facilities. A passenger terminal was constructed in 2001; however, there is no scheduled service at this time. Aircraft operations include cargo, corporate, general aviation, and pilot training aircraft. In 2000, Williams Gateway Airport handled approximately 300 tons of cargo.

Park and ride facilities, which are considered intermodal terminals, were previously described in Section 3.2, Public Transit.

e. Transportation System Continuity and Performance

Roadways

Based on the information presented in Chapter 2, the existing roadway system conditions were reviewed to identify existing continuity and performance in the system. The existing system was compared to standards such as facility continuity and consistent lanes to identify "missing links" and the volumes were compared to capacity standards to determine level of service. A discussion of the roadway performance is presented below.

The Arterial Grid

The arterial grid has been established as the pattern for roadway development in the Phoenix metropolitan area. Currently, there are roadways with discontinuities of the arterial grid. Section line roadways can be interrupted by major developments by physical features such as canals, major washes, topography, or by existing infrastructure such as freeways and railroads.

Major developments in the study area include Sun Lakes, Williams Gateway Airport, Chandler Municipal Airport, and the General Motors Proving Grounds. The developments are well established and with the exception of General Motors are expected to remain. The roadways do not continue through them. If additional capacity is needed, it will have to be provided on the surrounding streets. In the case of the Proving Grounds, General Motors has indicated that it is relocating its operations in the future. The continuation of the grid should be considered in this area. The roadways that are impacted by the major developments are included in Table 3-7.

In some locations, the grid system is interrupted by physical features. Physical features in the study area include the Eastern Canal, Consolidated Canal, the Roosevelt Conservation District Canal, the Central Arizona Project, the San Tan Mountains, the Union Pacific Railroad, and the Queen Creek. In most cases the physical features can be crossed once money is allocated for the facility. The roadways that are interrupted by physical features in the area are included in Table 3-7.

TABLE 3-7
DISCONTINUOUS ROADWAYS (2002)

ROADWAY	FROM	TO	REASON
Dobson Rd	Ocotillo Rd	Riggs Rd	Development
Cooper Rd	Germann Rd	Queen Creek Rd	Development
Warner Rd	Ellsworth Rd	Meridian Rd	Development
Ray Rd	Ellsworth Rd	Meridian Rd	Development
Williams Field Rd	Power Rd	Crismon Rd	Development
Sossaman Rd	Germann Rd	Warner Rd	Development
Hawes Rd	Germann Rd	Warner Rd	Development
Crismon Rd	Germann Rd	Guadalupe Rd	Development
Germann Rd	Higley Rd	Sossaman Rd	Physical features
Ocotillo Rd	Greenfield Rd	Recker Rd	Physical features
Pecos Rd	Higley Rd	Rittenhouse Rd	Physical features
Chandler Heights Rd	Ellsworth Rd	Rittenhouse Rd	Physical features

Scalloped Streets

The current process of requiring improvements as part of individual development approvals has led to varying roadway widths along a section of road. As communities grow and development occurs, roadways begin to meet. Although the locations may match, often times their design does not. A 4-lane roadway traveling from one community or development may narrow to a 2-lane roadway as it enters another community, a different development, or county island. The inconsistencies in the number of lanes can be confusing for drivers.

There are many roadway segments in the study area that have varying cross sections. Specifically, scalloped streets have been identified as an issue by Gilbert and Chandler.

Level of Service

Level of Service (LOS) is the term used to describe the degree of traffic congestion on a roadway. The various levels of service, which range from A to F, are generally defined as follows:

- **Level of Service A** represents free flow.
- **Level of Service B** is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable.

- **Level of Service C** is in the range of stable flow, but marks the beginning of the range in which the operation of individual users becomes significantly affected by others.
- **Level of Service D** represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
- **Level of Service E** represents operating conditions at or near the capacity level. All speeds are reduced to a low but relatively uniform value.
- **Level of Service F** is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount, which can traverse the point.

Level of Service can be estimated for various different roadway parameters and time frames. LOS can be calculated for roadway segments, intersections, freeway mainline, and ramps. LOS can also be calculated for different time periods including daily, a.m. peak hour, and PM peak hour.

The operating efficiency of a roadway segment can further be defined by comparing volume to capacity. The ratio of the volume on a segment of road compared to the traffic capacity of the segment is known as the v/c ratio. This is calculated for each segment by simply dividing the traffic volume or forecast for the segment by the capacity of the segment. For this analysis, the daily volume was compared to the daily capacity to obtain a volume to capacity ratio.

The volume to capacity ratio is equated to level of service to define the performance of a road segment. The relationship between v/c ratio and level of service is summarized in Table 3-8.

TABLE 3-8
LOS AND V/C RELATIONSHIP

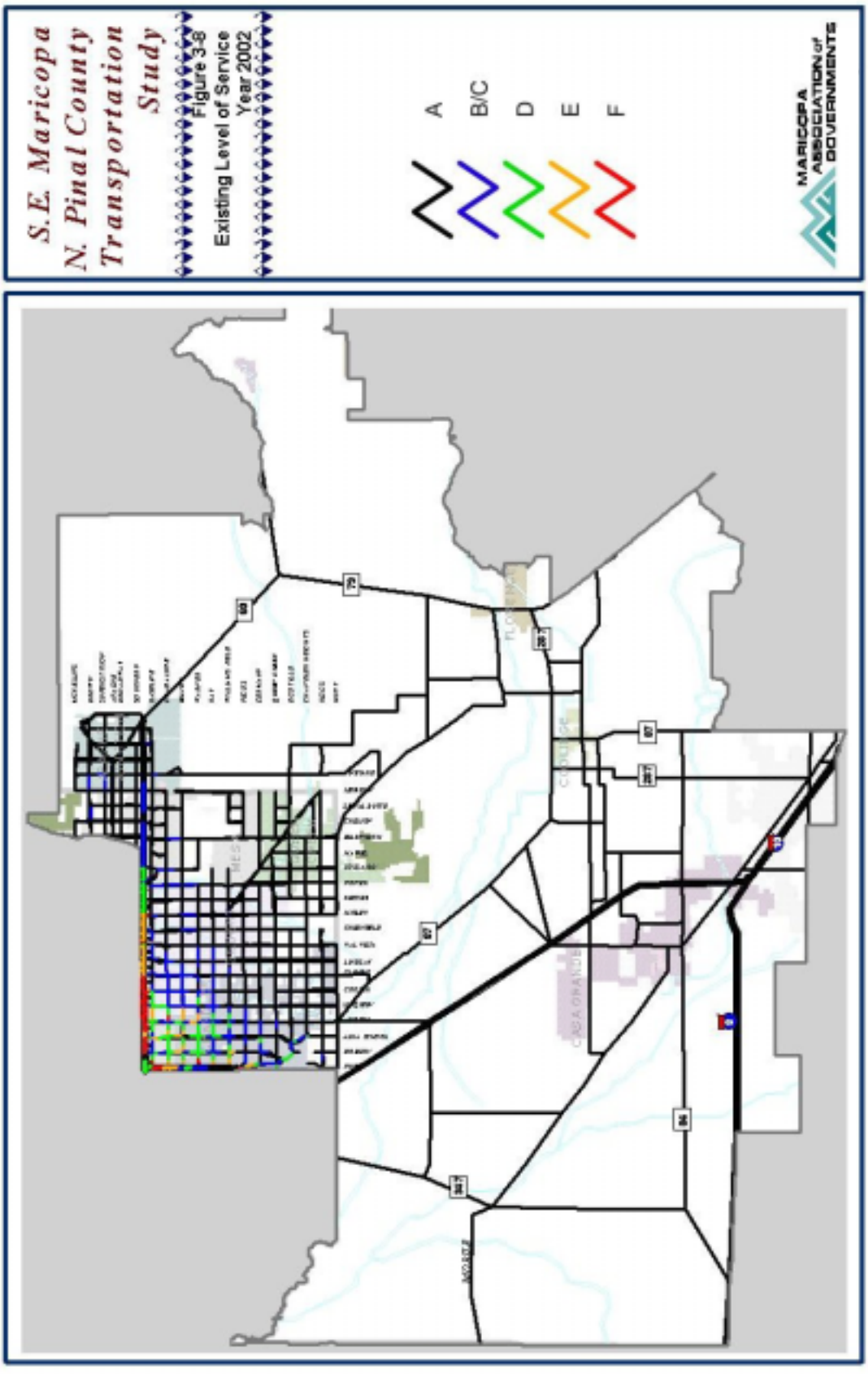
LEVEL OF SERVICE	V/C RANGE
A	0.0 to 0.6
B	0.61 to .7
C	0.71 to 0.8
D	0.81 to 0.9
E	0.91 to 1.0
F	greater than 1.0

The levels of service for roadway segments within the study area are shown in Figure 3-8 and intersections are shown in Figure 3-9.

Network Performance

A summary of the current street system statistics and performance measures for the study area-focus area is presented in Table 3-9. Centerline miles, lane-miles, and vehicle miles of travel (VMT) provide a measure of the magnitude of the roadway system and can be used to compare future networks presented later in the report. Intersection level of service (LOS), congested lane-miles, hours of delay, and average speed are measures of the system performance. These measures can be compared to future networks.

A further look at Table 3-9 can provide some interesting statistics for use in comparing the different network packages. The average number of through lanes per mile on the arterial system is 3.3 in Maricopa County and 2.3 in Pinal County. The average number of lanes per mile on the freeway system is 5.4 in Maricopa County and 4.0 in Pinal County. The average daily volume on the arterial system is 13,400 vehicles in Maricopa County and 8,200 in Pinal County. On the freeway system, the average daily volume is 107,700 in Maricopa County and 34,800 in Pinal County.


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 3-8
Existing Level of Service
Year 2002
A
B/C
D
E
F
MARICOPA
ASSOCIATION of
GOVERNMENTS

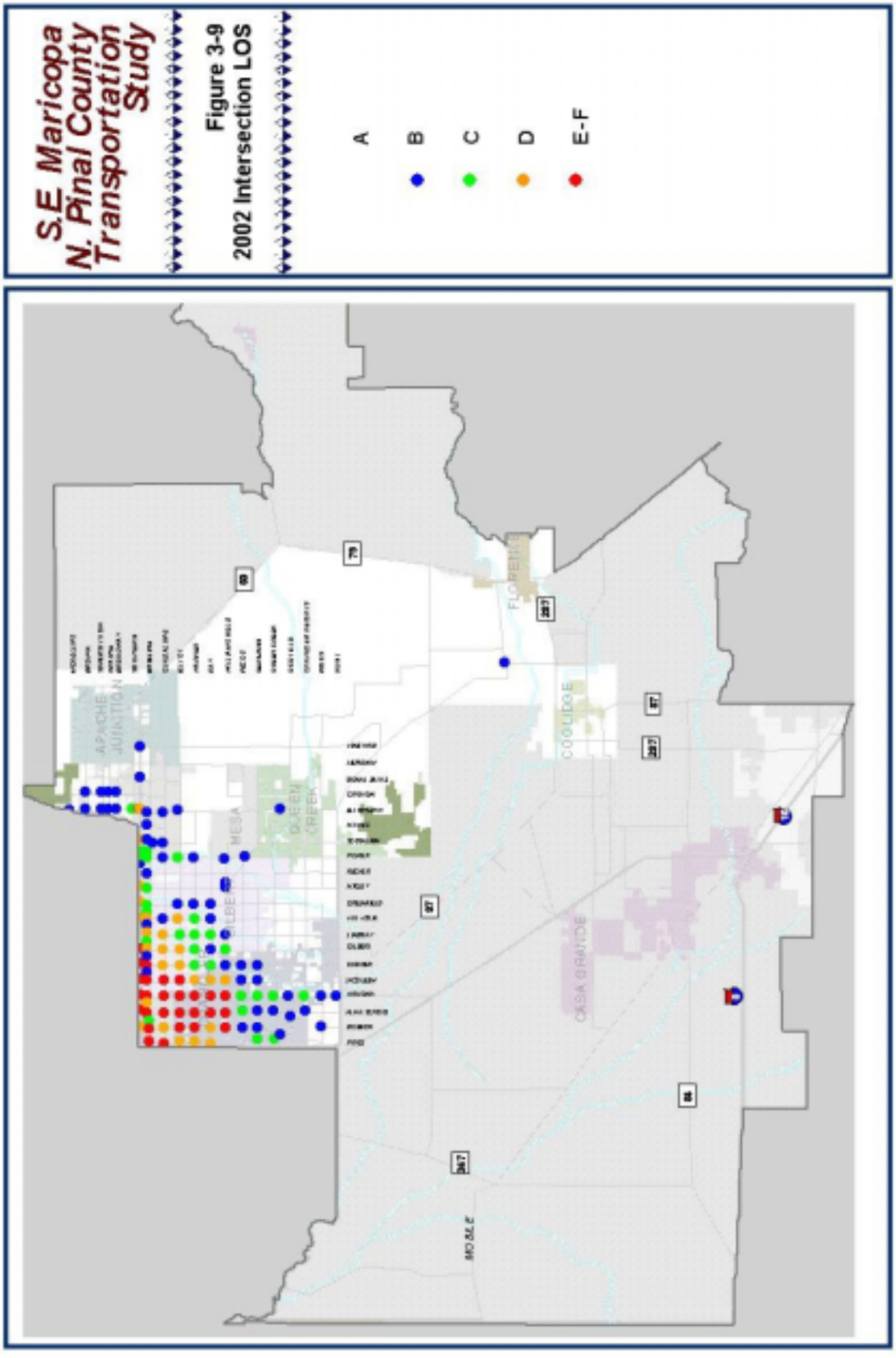

S.E Maricopa
N. Pinal County
Transportation
Study
Figure 3-9
2002 Intersection LOS
A
B
C
D
E-F
APACHE JUNCTION
MESA
QUEEN CREEK
FLORENCE
COOLIDGE
CASA GRANDE
MOLLE
79
60
287
87
387
8

TABLE 3-9
YEAR 2002 STREET SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	455	159
Freeway & Expressway	36	17
Freeway-HOV	0	0
Total	491	176
LANE MILES		
Arterial	1491	368
Freeway & Expressway	195	68
Freeway-HOV	0	0
Total	1686	434
DAILY VMT		
Arterial	6,098,100	1,309,800
Freeway & Expressway	3,878,600	592,200
Freeway-HOV	0	0
Total	9,976,700	1,902,000
INTERSECTION LOS		
D	37	0
E	33	0
F	10	0
Percent Congested	26	0
CONGESTED LANE MILES-PM Peak		
Arterial	114	5
Freeway & Expressway	37	0
Freeway-HOV	0	0
Percent Congested	9	1
HOURS OF DELAY-PM Peak		
Arterial	3515	109
Freeway & Expressway	2992	19
Freeway-HOV	0	0
Total		128
AVERAGE P.M. PEAK SPEED		
Arterial	31	35
Freeway	42	63
Freeway-HOV	NA	NA

Public Transit

There is still relatively little transit service in the Southeast Maricopa/Northern Pinal County area. As shown in Chapter 2, fixed route service currently exists on some of the arterial streets in the northwest portion of the study area. With only 21 local routes provided in the cities of Mesa, Chandler, and Gilbert, equal service coverage does not extend to similarly developed areas. The hours of operation are not consistent within the service areas. Routes in Mesa run until 10 p.m. while service in Chandler ends at 6:30 p.m. In addition, the frequency of service varies which can make transfers between routes difficult. Another deficiency is the lack of service on Sundays.

East Valley Dial-a-ride in Mesa, Chandler, and Gilbert provides paratransit services to a portion of the study area. Much of the area does not have access to paratransit.

Bike/Pedestrian/Trail System

For non-motorized uses, physical deficiencies most often take the form of gaps in the route or system and barriers within the route itself.

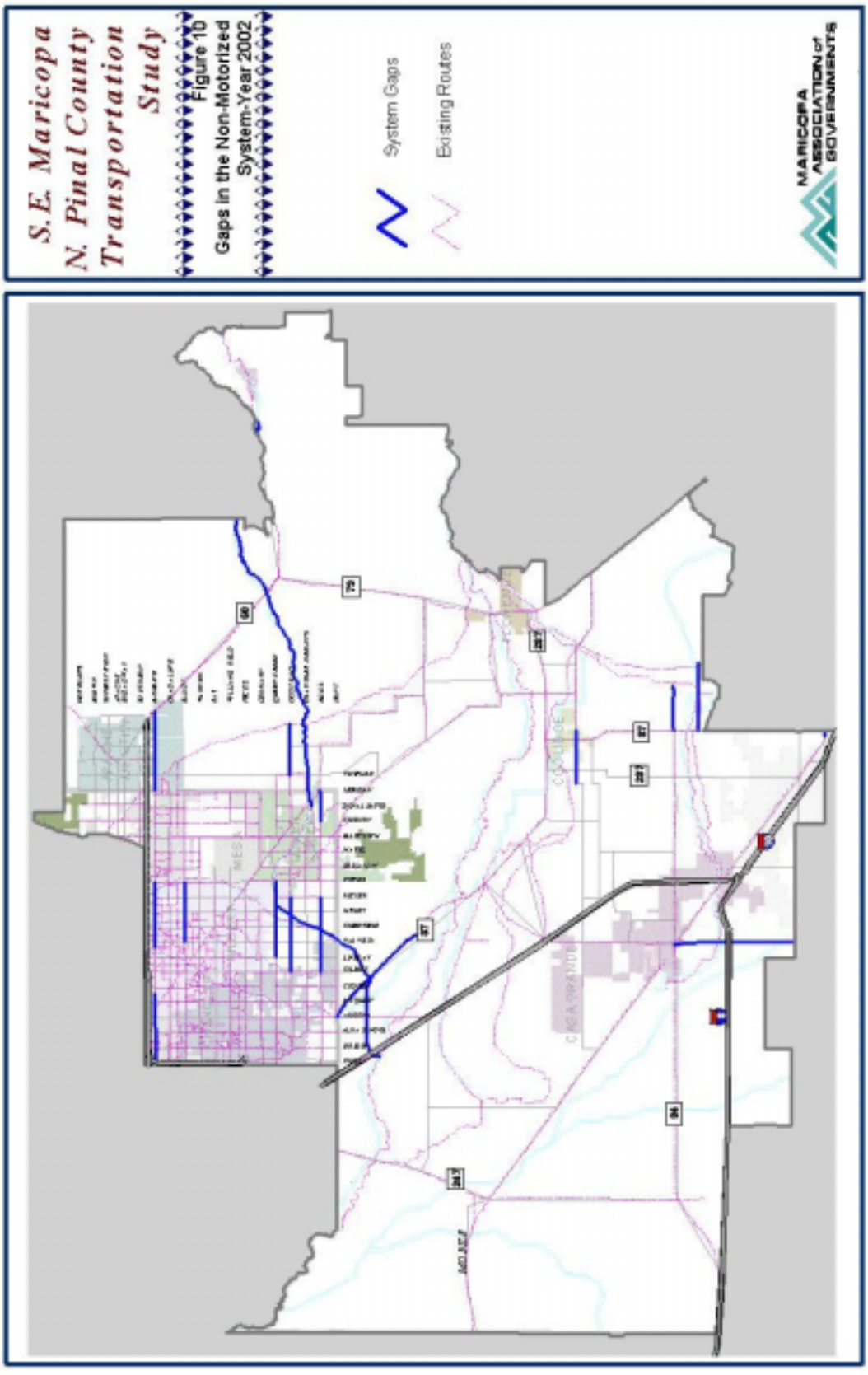
Pedestrian areas were found to be present and fairly adequate in most communities' central business districts, with improvements funded by various grants. Recreational walking and hiking has been planned for in most jurisdictions.

Policy and planning deficiencies are most often found in requirements for bicycle transportation on street and in budgeting priority. For pedestrians, the most common deficiency is recognition of pedestrians as a mode of travel other than recreational walking.

Gaps and Barriers

Gaps can take the form of missing corridors in the system from destination to destination, gaps in an otherwise planned corridor, and gaps between on-street and off-road facilities. Gaps between cities and rural areas have been identified in Figure 3-10.

As shown on Figure 3-10, gaps in existing and planned bicycle facilities are found in both the on-street and off-road categories.


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 10
Gaps in the Non-Motorized
System-Year 2002
System Gaps
Existing Routes
MARICOPA
ASSOCIATION of
GOVERNMENTS

Several arterial streets had gaps within a jurisdiction's planning area, and between jurisdictions. Examples are on:

- Baseline Road
- Elliot Road
- Queen Creek/Ocotillo Road
- Riggs Road/Combs Road
- Kenilworth Road

Throughout the southeast region, canal bank facilities are a part of most jurisdictions' planning process. However, gaps occur in connecting the canal to the street system or to each other. Examples are:

- Connecting the confluence of canals at the southeast corner of the region and to SR 87 in this same area
- Roosevelt Canal through the Gila River Indian Reservation

Several jurisdictions have planned for Queen Creek Wash to be an off-road non-motorized facility to provide an alternate to travel on US60. However, a significant gap occurs between the Town of Queen Creek and Apache Junction.

Barriers at a regional scale are usually present when an off-road or on-street facility confronts a canal, drainageway or wash, freeway or elevated railroad crossing. In the southeast region, barriers can be found at the intersections of:

- Canal routes and freeways such as the I-10, US 60.
- Canal routes and the railroad/Rittenhouse Road system
- Arterial Streets and canals
- The future 202 and both off-road and on-street facilities

4.0 IDENTIFICATION OF ISSUES AND NEEDS

Based on the review of other related studies, preliminary transportation data, and interviews with study stakeholders, a number of key transportation issues have been identified in the Southeast Maricopa/ Northern Pinal County area. Many of these issues are similar to those facing other rapidly developing urban areas.

The study area has significant transportation facilities and service including freeways, arterials, express and local bus, and rail lines, which must all be considered in any future assessment and planning of transportation improvements.

Because of the nature of urban development and the practice by most agencies to improve arterials only along their frontage as development occurs, many arterial streets do not have a continuous width. This is commonly known as 'scalloped streets' and can cause serious capacity constraints as well as safety concerns. Some agencies, like the City of Chandler, have instituted impact fees in order to build continuous sections of arterial streets.

Another concern is discontinuous development. In some cases new development is several miles from the existing developed area and the arterial streets between the two areas have not been improved. However, many new trips can occur on these unimproved sections, which can cause congestion issues.

One of the most significant issues for the study area is the rapid development in southeast Mesa, eastern Gilbert, Queen Creek, and Northern Pinal County. The uncertainty of the redevelopment of the General Motors (GM) property, the potential and planned expansion of Williams Gateway Airport, and the numerous new housing developments, especially in Pinal County raise a concern that the currently planned transportation system cannot accommodate this growth.

The need to identify and protect right of way for new facilities is also a major issue. It is particularly important to define new regional corridors so that additional planning can be completed to define specific alignments and integrate right of way requirements into the land use planning process.

This chapter describes the transportation issues, combining local and regional input to create a broad understanding of what is needed to meet transportation goals and needs in the area.

The discussion of issues has been categorized – mainly by mode with references to other modes as appropriate to address key intermodal issues. The categories are:

- Arterial and State Highway
- Freeway
- Transit
- Bicycle/Pedestrian
- Airport Access

This is consistent with how project funding is allocated in the MAG region. However, the intent is not to segregate modes in the final plan, but to build from the comments received and information gathered toward a multimodal strategy for the Area Study and ultimately the Regional Transportation Plan. This report also identifies the general time frame within which the issue or improvement becomes critical to the long-term viability of the transportation system. In some cases, the report touches on issues not immediately discernible from present data or trends, but experience tells us that these issues must be considered.

a. Arterial and State Highway Issues

The primary emphasis in the development of the Southeast Maricopa / Northern Pinal County transportation system has been the arterial street and state highway network. The area is served by a grid system that connects activity centers with a hierarchy of roadways ranging from local streets in neighborhoods to limited access freeways for regional travel. There are exceptions to the grid system including Rittenhouse Road, Hunt Highway in Pinal County, and the state highway system.

One issue is the discontinuity and the irregularity of portions of the arterial grid. Section line roadways can be interrupted or limited by major developments (e.g., Sun Lakes, Williams Gateway Airport), physical features such as canals and major washes, or because development has yet to occur. The current process of requiring improvements as part of individual development approvals has led to varying roadway widths along a section of road. This study addresses: 1) how to overcome or bypass discontinuities to benefit and not negatively impact adjacent neighborhoods, businesses or institutions; and 2) how to encourage a more uniform treatment across

jurisdictional boundaries as well as from one development project to another. Currently, each agency assumes responsibility for its arterial grid system and occasionally the future planned number of lanes is not consistent across jurisdictional boundaries.

Expand the Arterial Street Grid / Improve State Highways

There is consensus throughout the study area that the arterial grid is the backbone of the road system and is essential to the future growth of the area. Much of the growth in the study area is occurring in the "focus area" of the study (see study area map) and there is considerable interest in identifying additional opportunities for roadway capacity to accommodate it. There is a need to widen existing arterial streets and to plan for those that currently do not exist, but are needed to sustain growth. However, enhancing selected existing arterial streets to include grade separations at major intersections to provide higher capacity does not appear to be supported.

Topography, existing development such as Williams Gateway Airport, and planned development such as GM and Johnson Ranch may prevent a uniform treatment of the arterials. In the absence of a complete grid system, certain trips will be made on the regional freeway system, resulting in more congestion and inefficient overall system usage.

Some specific issues and needs for arterials and the state highways are listed below.

- Complete the arterial street system as the GM property develops.
- SR 87 will need to be widened.
- Existing arterials at the Maricopa/Pinal County line need to be extended east and south.
- Extend Arizona Boulevard north to Hunt Highway from I-10.
- Treatment of Rittenhouse Road.
- Ellsworth Road realignment proposed near Pecos Road.
- Access to State Trust land needs to be considered.Extension of SR 88 to the south.
- SR 79 needs to be widened.
- Need US 60 bypass in Gold Canyon area.
- Need an additional crossing of the CAP in Apache Junction.
- Widen and extend Attaway Road.
- Future cross section of Ganzel Road (Vineyard) (six lanes).

Scalloped Streets

As communities grow and development occurs, roadways begin to meet. Although the locations may match, oftentimes their design does not. A 4-lane roadway traveling from one community or development may narrow to a 2-lane roadway as it enters another community, a different development, or county island.

b. Freeway Issues

Protect Right-of-Way Needed for Future Roadways

As development activity continues to move outward, there is interest in defining and protecting the right-of-way of future facilities needed to accommodate such growth.

The corridors that have been identified as potential new regional facilities include:

- Corridor from I-10 in Pinal County north to the East Valley area.
- Freeway facility from Loop 202 in Mesa east to Williams Gateway Airport and extending east into Pinal County.
- Corridor south from US 60 around Queen Creek and west toward Loop 101 and/or I-10.

Add and Improve Freeway Interchanges at Key Locations

New or improved interchanges have been identified through stakeholder interviews and technical analysis to date at locations where economic activity has grown and begun to overload existing interchanges or impact adjacent streets. These interchanges include:

- A half-diamond interchange is needed at Meridian Road on US 60 for traffic traveling to/from the west. This would provide access to downtown Apache Junction.
- An interchange has been included on the Santan Freeway at Hawes Road. This interchange should eventually be a freeway-to-freeway type. A freeway would extend from this location at the northeast corner of Williams Gateway to the east into Pinal County. The facility may be phased in as development occurs.
- New interchanges on I-10 at Chandler Heights Road and in Casa Grande (Val Vista and Korsten Roads)
- Interchange modifications at various locations where additional turn lanes are needed on the crossroad.

Widening Existing Freeways

Based on future traffic volumes as forecast by MAG and CAAG, freeways in the Southeast Maricopa and Northern Pinal County areas will likely require expansion to accommodate the traffic expected in the area.

- Widen US 60 in Pinal County.
- Widen Loop 202.
- Widen Loop 101.
- Add HOV lanes on Loop 101 and Loop 202.

c. Transit Issues

There is still relatively little transit service in the Southeast Maricopa/Northern Pinal County area. Cities have recognized the need for alternatives to the automobile as they grow, but funding has not as yet followed that realization. None has dedicated sources of revenue for transit development and operation except for the City of Mesa, which uses a portion of its Quality of Life tax. An overreaching issue is management and operation of transit service.

With few exceptions, most of the communities within this study area are at the stage where developing and maintaining adequate roadways is the highest priority. As the communities grow, and in particular in those communities with less significant amounts of developable land, identifying and developing alternative transportation modes will become a higher priority. Many community General Plans identify current or projected transit needs and multimodal opportunities.

Some of the key questions to be addressed are:

- What is the range of transit services required for the area?
- Are additional passenger amenities such as transit centers, shelters, and park and ride lots required?
- Are intermodal connections needed?
- What level of rural transit service is appropriate?
- Does development encourage the use of transit service?
- Are the needs of the low income and elderly being met?

The most common challenge identified among the area's communities regarding transit development is funding. Some cities are very small and do not have the critical

mass to support a local tax or other revenue source. Others do not yet have an urgent need for alternatives to the automobile. On the other hand, even the smaller communities have recognized the limitations of relying on the highway system alone to handle travel demand in the future, and some (e.g., Coolidge) have worked hard to provide local transit/paratransit services.

Bus Service

Specific needs that have been identified include:

- Apache Junction will need to tie into metro transit system.
- Vanpools are currently provided for prison staff and similar service should be pursued for other transit users.
- Commuter service from Casa Grande to Phoenix via Greyhound.
- Local transit service between Pinal County communities.
- Basic grid bus system needs to be upgraded and expanded.
- Express bus and park and ride lot for commuters from Gold Canyon.
- Transit service would be beneficial between Apache Junction and Casa Grande.

Long Term Plans for High Capacity Transit Service

The study of high capacity transit is currently underway to identify where such service might offer the potential of improved mobility in the region. Commuter rail is of interest in many of the communities that abut the Union Pacific Railroad right-of-way and it is a corridor that is being evaluated in the study. Even outlying communities view commuter rail as an opportunity for their residents to access downtown destinations in the more urbanized areas of the Valley. Chandler is currently conducting a major investment study to identify high capacity transit options – which could include light rail, express bus, bus rapid transit, or commuter rail. The study is scheduled for completion by the end of 2002.

HOV Lanes on Freeways

There is consensus that HOV lanes need to be added and continued on the current freeway system and be included in any new freeways. Freeway to freeway connections of HOV lanes will also be needed.

Expansion of Light Rail

The City of Mesa is currently participating in the Valley Connections light rail project. Light rail will extend approximately one mile into Mesa, along Main Street from the

Tempe border to Longmore. This project is expected to be complete by 2006. Mesa also plans to extend light rail into its downtown to Mesa Drive, although the route through downtown has not yet been determined. Other communities (e.g., Chandler) are also considering the possibilities of light rail. The MAG LRTP shows a potential LRT corridor along I-10 and Arizona Avenue/Mesa Drive.

d. Non-Motorized Issues

Bicycling and walking can be a solution to certain transportation problems. Family and personal business, which includes shopping and other types of errands, are the most common reasons for traveling. Also, national surveys show that approximately 40 percent of all trips are less than two miles in length. This distance can be easily traveled on a bicycle in 10 minutes or walked in approximately 30 minutes. Most cities now incorporate bicycle facilities in their street cross sections.

Most circulation elements of the municipal general plans in the study area show bicycle lanes on both arterial and collector streets.

Some of the bicycle/pedestrian issues that have been identified include:

- Inclusion of bicycle lanes on new arterial and collector roadway cross-sections.
- Design practices to minimize barriers to bicycle travel from grade separations, bridges, canals, or other obstructions.
- Availability of bicycle parking facilities.
- Well-lighted sidewalks present along travel routes.
- Coordination to ensure that bicycle and pedestrian facilities connect across city boundaries.
- Multi-use pathways that connect street system bikeways and sidewalks with transit networks to provide linkages between trip origins and destinations.

The Maricopa County's Trail Commission has been working to form a regional trail system. The goals of the program are to connect the County park system, link recreational corridors around the Valley, and help preserve open space in the community. This is an example of how a coordinated plan can support alternative modes of travel as part of a regional recreational / transportation element. The key to their contribution is in their implementation. Once they are in place, they can serve multiple uses. It also takes a number of communities to agree on the treatment within their areas to raise and maintain support for the project.

The Town of Florence has designated a system of trails and paths in its General Plan; Pinal County has built 13 miles of the Arizona Trail and a portion of the Superstition Trail in conjunction with Apache Junction, and bike and equestrian trails are included in Queen Creek's General Plan.

e. Airport Access Issues

Williams Gateway Airport, a partnership of the City of Mesa, Town of Gilbert, Town of Queen Creek, and the Gila River Indian Community, has significant potential for future impact on the area's transportation systems. The passenger terminal is currently on the west side of the airport, but will be relocated to the east side in the future. Access will be from the Loop 202/Hawes Road Interchange and Ray Road.

The City of Mesa has included a new regional facility to serve the airport from the east in their Transportation Plan. Additional transportation infrastructure around the airport will encourage industrial development.

5.0 FUTURE BASE TRANSPORTATION SYSTEM

The arterial street system forms the backbone of the area's transportation system. The expansion of the arterial street network is needed to support economic development and accommodate growth. The arterial street system additions and improvements are often provided with new development. As a result, these improvements follow the pattern of development.

This chapter describes the improvements to the existing arterial system to form what is defined as the Future Base. This system represents the long-range (20 years plus) street network target for the study area. The improvements include widening existing streets, new arterial segments, and one addition to the freeway system, Loop 202.

The improvements to the arterial street system are consistent with the current Apache Junction, Chandler, and Mesa Transportation Plans, the Draft Gilbert Arterial Street Plan, and the Queen Creek Circulation Element with the exception of planned changes to Rittenhouse Road. Several changes are planned to Rittenhouse Road by the local agencies.

The Town of Queen Creek Circulation Element shows a realignment of Rittenhouse Road at Ocotillo Road, Ellsworth Road, and the Sossaman/Germann intersection in order to improve intersection geometry and separate Rittenhouse Road from the railroad. However, from a traffic standpoint, the road will still exist.

North of Germann Road, both the Town of Queen Creek and the Town of Gilbert are expected to abandon Rittenhouse Road. North of Germann, the Town of Queen Creek shows a realignment of Rittenhouse Road to the west and intersecting Power Road. Both the Town of Gilbert and the City of Mesa plan a realignment of Pecos Road approximately ½ mile south of the section line with a new intersection at Power Road. Both Pecos Road and Germann Road are shown as six-lane arterials in the City of Mesa and Town of Gilbert plans to help offset the abandonment of Rittenhouse Road.

a. New Arterials

The majority of the additions to the arterial street system are in the eastern portion of Maricopa County and in Pinal County. However, there is new arterial construction in the developed portion of Maricopa County, which will eliminate many of the discontinuities in the existing system. The additions to the arterial street system increase the number of centerline miles of arterial street in Maricopa County from 455 to 554 miles and in Pinal County from 159 to 482 miles. The estimated cost of the new arterial streets is $373 million in Maricopa County and $963 in Pinal County. The new arterial construction is shown in Figure 5-1.

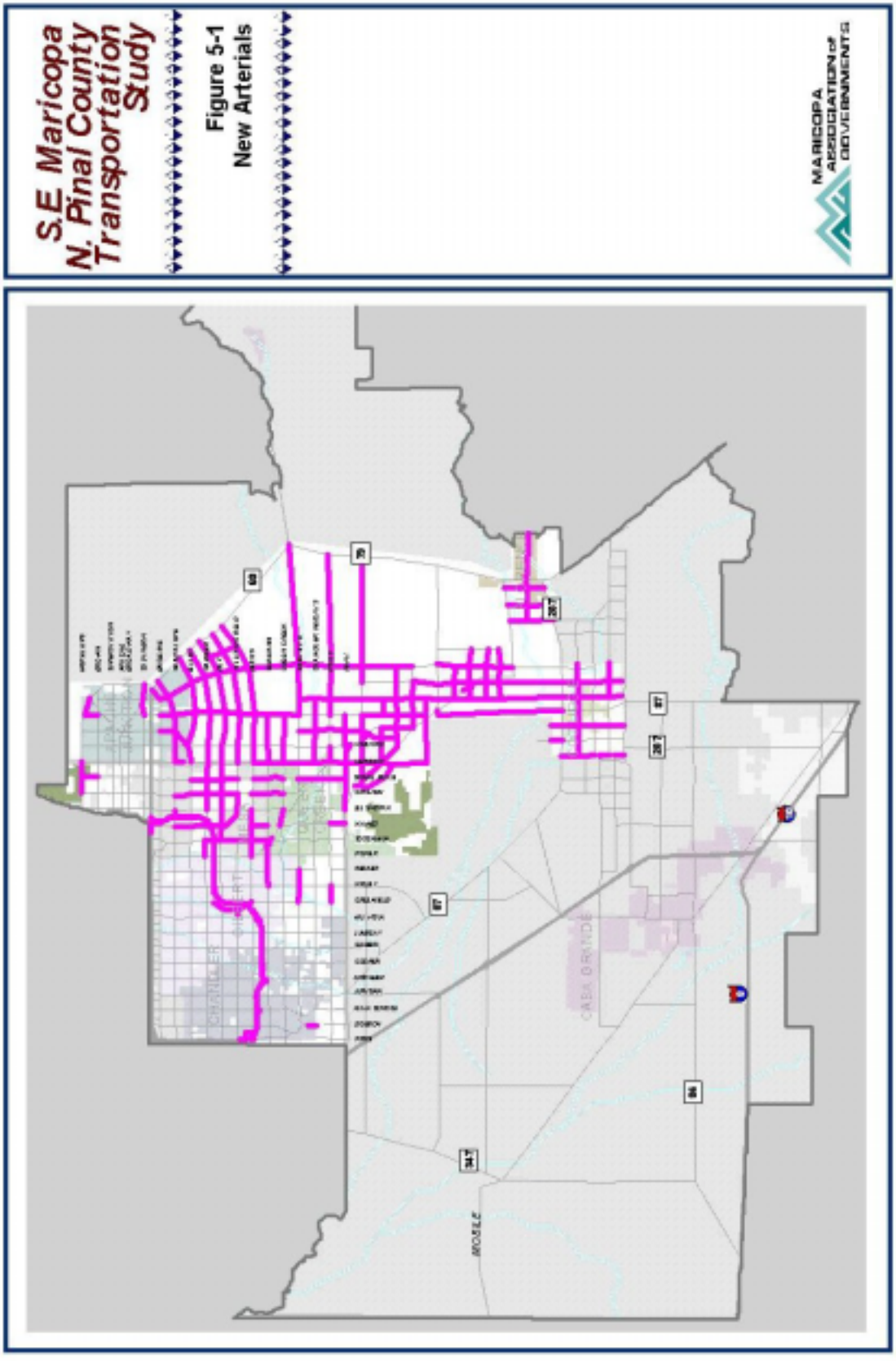
b. Arterial Widening

The Future Base arterial street network includes a substantial number of miles of arterial street widening. The majority of the street widening occurs in Maricopa County and Apache Junction. In many instances, arterial street widening from 4 to 6 lanes requires additional right of way. For this analysis, it is assumed that the right of way will be acquired to complete the widening.

Some of the arterial street widening in the Maricopa County portion of the study area addresses the issue of scalloped streets. With the implementation of the Future Base network, all of the streets with reduced width would be eliminated and a consistent cross section would be provided. There are 423 miles of arterial streets to be widened with 134 miles in Pinal County and 289 in Maricopa County. The estimated cost to widen the existing arterial streets is $1,213 million in Maricopa County and $402 million in Pinal County. Figure 5-2 shows the roadways that would be widened.

c. Intersection Improvements

Arterial street/arterial street intersection improvements are intended to provide additional capacity at locations where the individual arterial streets will not be widened, but the intersections have unacceptable level of service. This can occur at locations where arterials have been built to a practical limit of six lanes or locations where a four lane arterial street cannot be widened because of development and/or right of way constraints. The need can also occur at freeway ramp intersections that do not have dual left turn lanes or three through lanes in each direction. On a four lane arterial street, the intersection widening would provide three through lanes, two left turn lanes, and one right turn lane. On a six lane arterial street, the intersection widening would provide two left turn lanes and one right turn lane.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N. Pinal County
Transportation
Study
Figure 5-1
New Arterials
MARICOPA
ASSOCIATION of
GOVERNMENTS
CASA GRANDE
MAYBELLE

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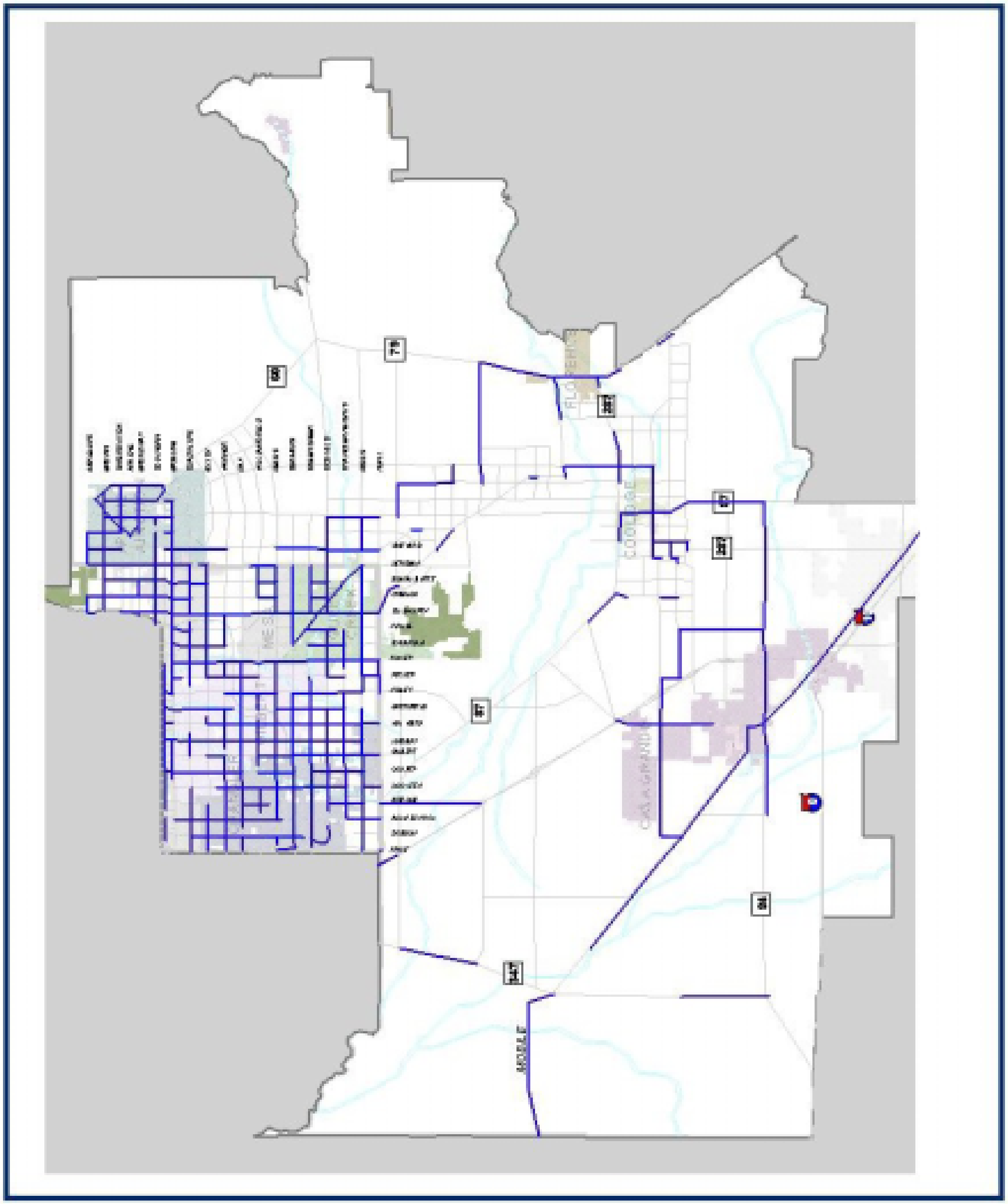
Figure 5-2
Arterial Widening

MARICOPA ASSOCIATION of GOVERNMENTS



It should be noted that the number of intersections at level of service E and F depends on the other system improvements described elsewhere in this report. If the freeway widening and HOV improvements are implemented, then the number of intersections is less than if only the arterial street improvements are implemented. Similarly, if the new corridors are implemented, then the number of intersections is less than with the other transportation improvement packages. For the future base, the number of LOS E and F intersections is 76 with 75 in Maricopa County and one in Pinal County.

The estimated cost of an intersection improvement as a stand alone project is $2.5 million. If one or both of the intersecting streets are widened, then the cost of the intersection improvement is incidental to the street widening cost. For cost purposes, it is assumed that half of the LOS E or F intersections or 38 would be separate projects. The estimated cost is $95 million.

d. Bridge Construction/Reconstruction and Railroad Crossings

There are a number of features in the study area that can be impediments to the continuity of the arterial street system including canals, railroads, and a river. If an

existing arterial street or an arterial street alignment crosses one or more of these features, then additional cost is included for the crossing.

A canal crossing is assumed to be four or six lanes wide, 50 feet long, and cost $60 per square foot. It is estimated there are 12 new four-lane, 12 new six-lane and 6 widen four to six lane canal crossings in Maricopa County. The estimated cost is $7.4 million. It is estimated there are six new four-lane and one new six-lane canal crossings in Pinal County. The estimated cost is $1.8 million. A river crossing is assumed to be four or six lanes wide, 100 feet long, and cost $90 per square foot. It is estimated there are eight new four-lane river crossings in Pinal County. The estimated cost is $5.9 million.

At-grade railroad crossings are generally not considered a desirable feature in the arterial street system. Railroad companies typically oppose new at-grade crossings and the Arizona Corporation Commission must approve each new crossing. It is estimated there are three potential expanded at-grade crossings in Maricopa County and 11 in Pinal County. An upgraded grade crossing is estimated to cost $.15 million

each. A railroad grade separated crossing is assumed to be four lanes wide, 50 feet long, and cost $110 per square foot for an estimated cost of $.5 million.

e. Arterial Improvement Program

There are several arterial streets in the study area that function as regional facilities because they are multi-jurisdiction, have good freeway connections and serve activity centers. These include, but are not limited to, the following.

- Arizona Avenue
- Gilbert Road
- Higley Road
- Power Road
- Ellsworth Road
- Ironwood Road
- Elliot Road
- Queen Creek Road
- Riggs Road

If one or more corridors are supported by the respective jurisdictions, then additional features could be considered to provide improved arterial operation. These features include capacity improvements such as widening and intersection reconstruction, ITS such as variable message signs, cross jurisdiction signal coordination, bus priority, arterial HOV lanes, and expanded bus service. Policy issues to consider are intersection and signal spacing and number of access points.

f. Arterial Operational Improvements

In 1996, a unique partnership known as AZTech was formed. The Phoenix area was one of four areas selected to receive model deployment initiative funding. The AZTech system provides motorists with traveler information real time traffic conditions, closures, and accidents. This information is provided using traffic camera, variable message signs, and a substantial communication system.

Phase I and II of AZTech were successful in disseminating real-time information through websites, kiosks, TV, and radio. The next phase of AZTech will provide real time digital traveler information.

In addition to AZTech, the Cities of Mesa and Chandler and the Town of Gilbert have computerized traffic signal systems. As new signals are installed they should be

added to the signal systems in order to maintain the most effective signal coordination. Opportunities for cross-jurisdiction signal coordination should be pursued.

g. Arterial Mitigation/Aesthetics

As arterial streets are built and widened to four and six lanes, it is important to address and mitigate potential negative impacts. The most common mitigation to address wider streets is to provide landscaping that is compatible with the adjacent neighborhoods. Generally, this is included in the cost of new or widened arterial streets. As part of these improvements, accommodations for pedestrian crossing must be considered.

In established areas where street improvements are not planned, then landscape rehabilitation enhances the arterial and supports the neighborhood character. In addition, noise concerns will need to be addressed primarily in those areas where arterial street widening is planned. Mitigation for noise impacts may require noise walls and/or rubberized asphalt.

h. Loop 202

The future base street network includes the addition of one new freeway – Loop 202. Loop 202 in the study area is part of the planned and programmed freeway system that was authorized by the voters in 1985. The Loop 202 includes a system interchange at Loop 101 and US 60 and several service interchanges in the study area. The estimated cost for the 22 additional miles is $880 million.

i. Roadway Network Operations

The number of lanes for the future base street network is shown in Figure 5.3. The 2020 and 2030 traffic forecasts for the future base network are presented in Figures 5-4 and 5-5. A comparison of Figures 5-4 and 5-5 shows that volume increases occur throughout the study area, but particularly in Pinal County.

The year 2020 and 2030 level of service for roadway segments within the focus area is shown in Figures 5-6 and 5-7. The level of service for intersections is shown in Figures 5-8 and 5-9 for the years 2020 and 2030 respectively. The areas of level of service D, E, and F begin to extend southeasterly in the focus area compared to the existing. Not surprisingly, the level of service is slightly worse in 2030 than 2020 because of the added growth, but no additional network changes. It may be noted that

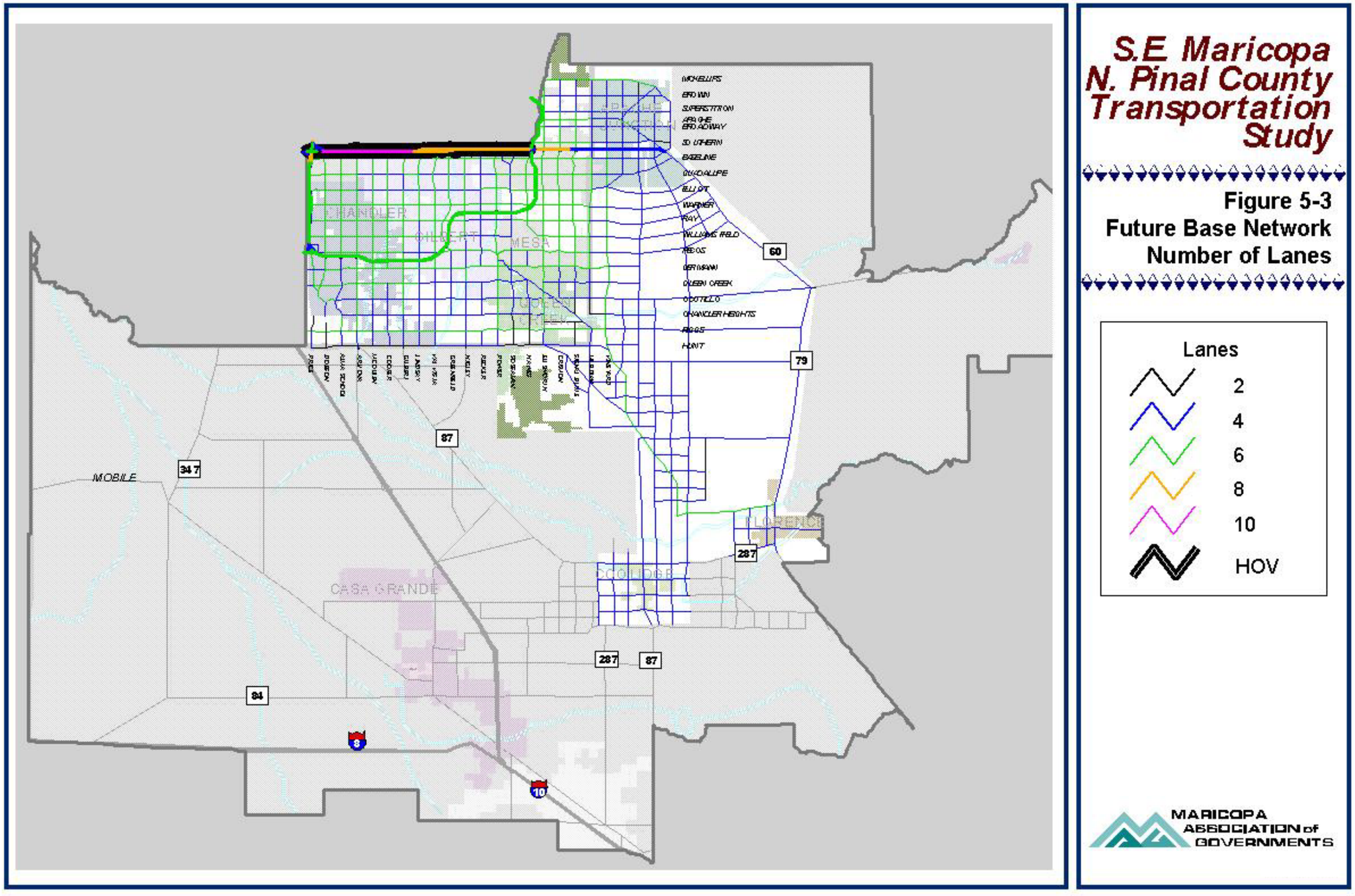


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Figure 5-3
Future Base Network Number of Lanes

Lanes
- 2
- 4
- 6
- 8
- 10
- HOV

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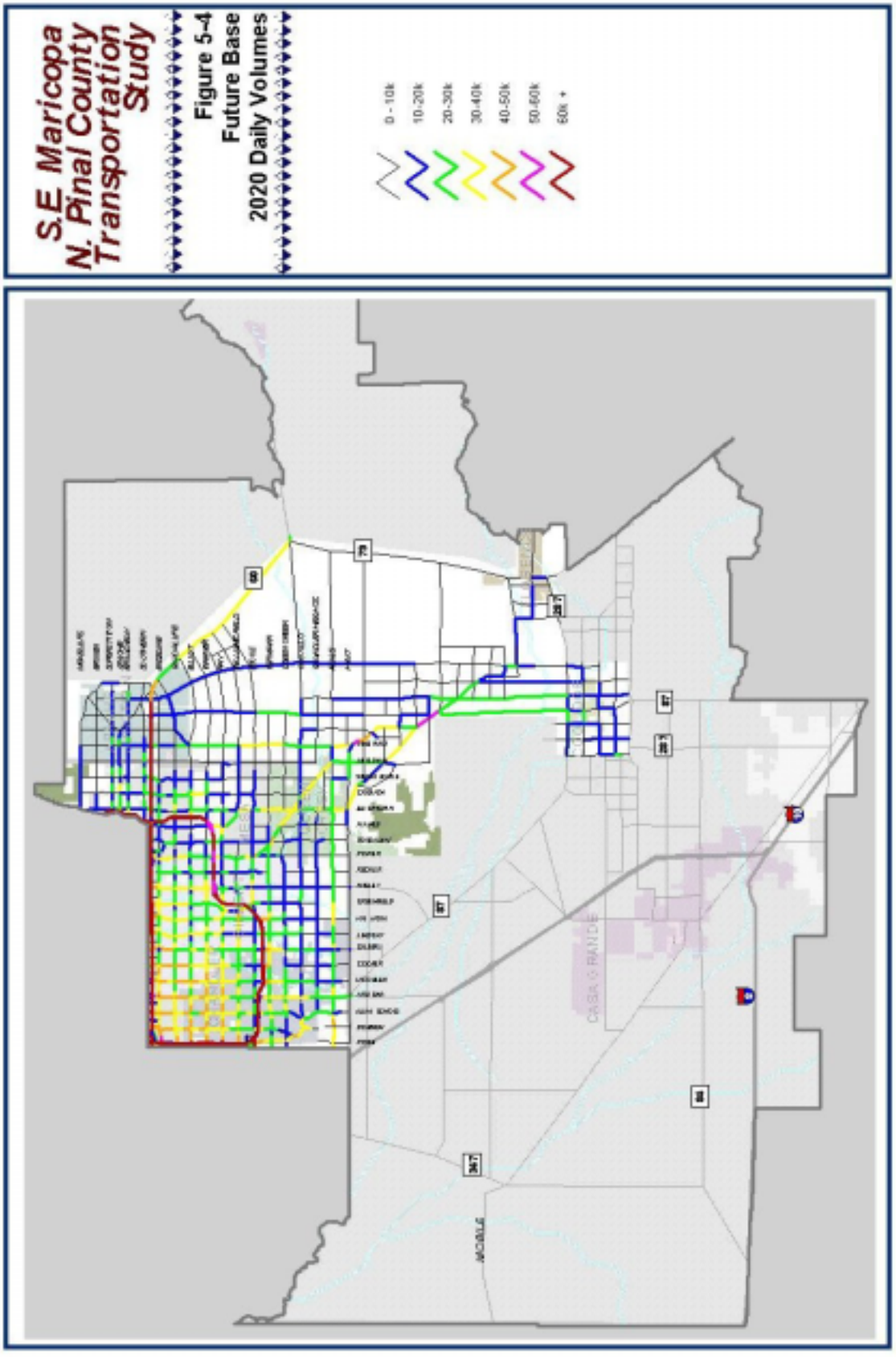
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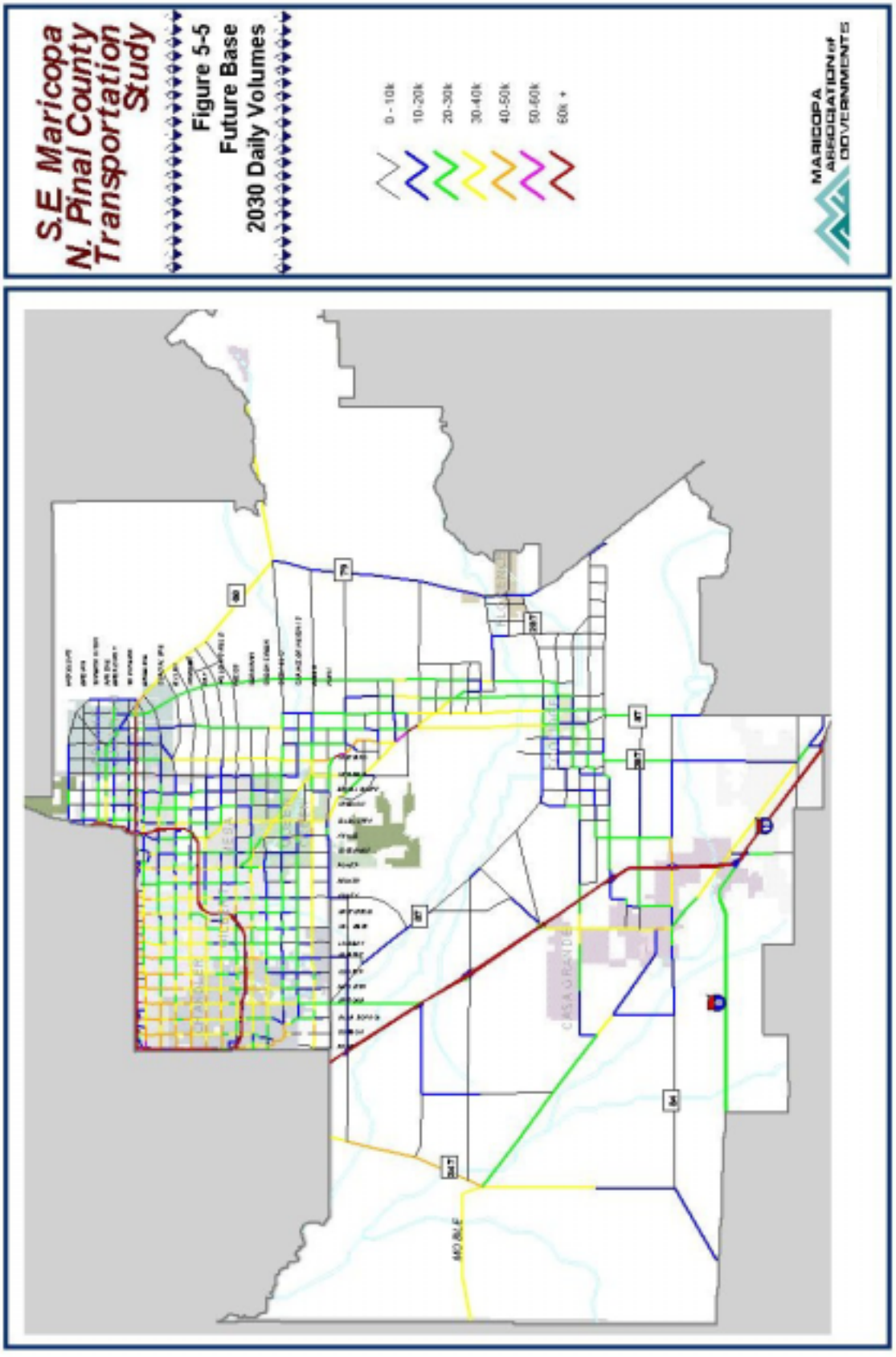
Transportation
Study
Figure 5-4
Future Base
2020 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
79
60
387
87
347
CASA GRANDE
MARICOPA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N. Pinal County
Transportation
Study
Figure 5-5
Future Base
2030 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
MARICOPA
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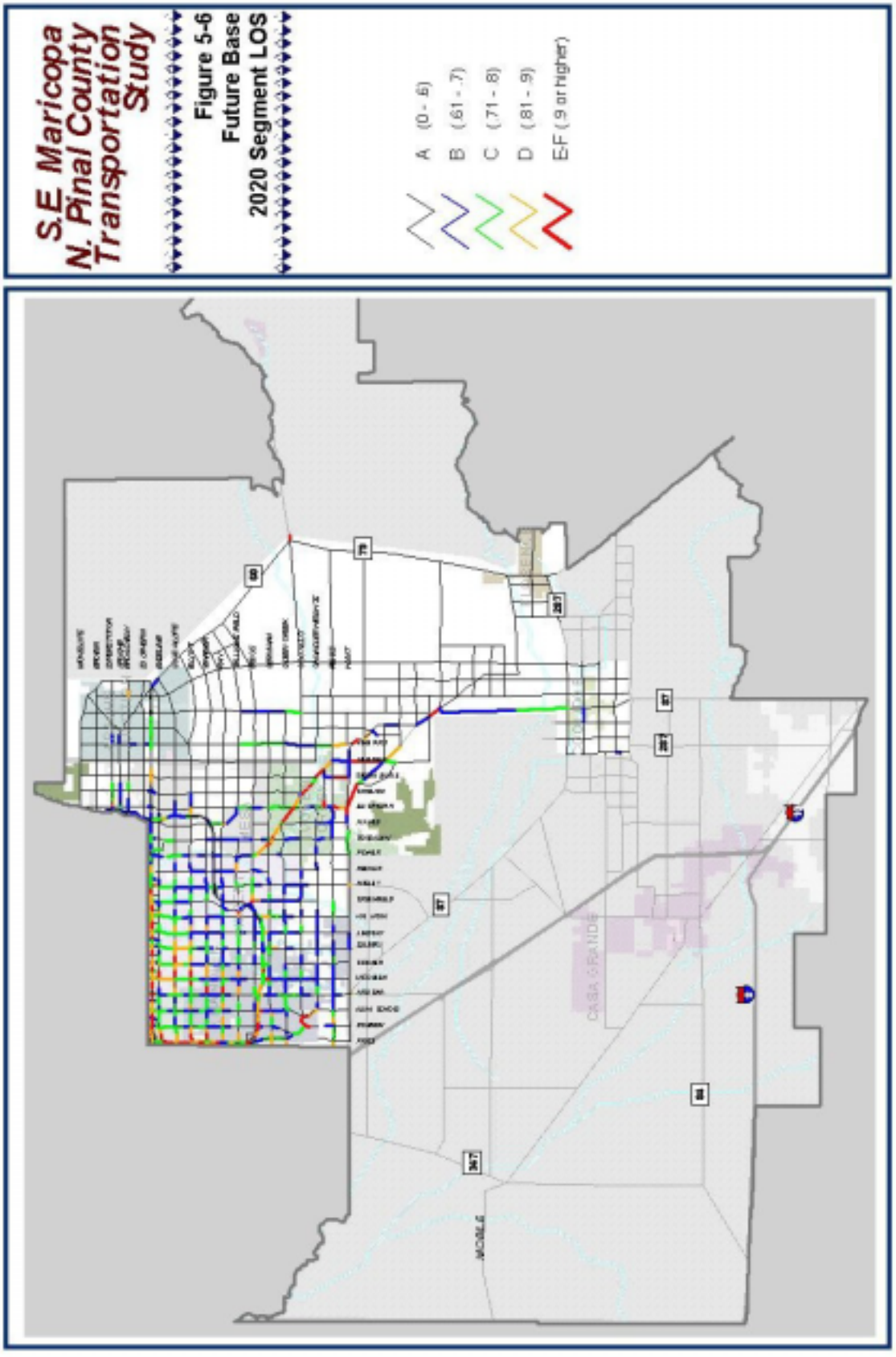
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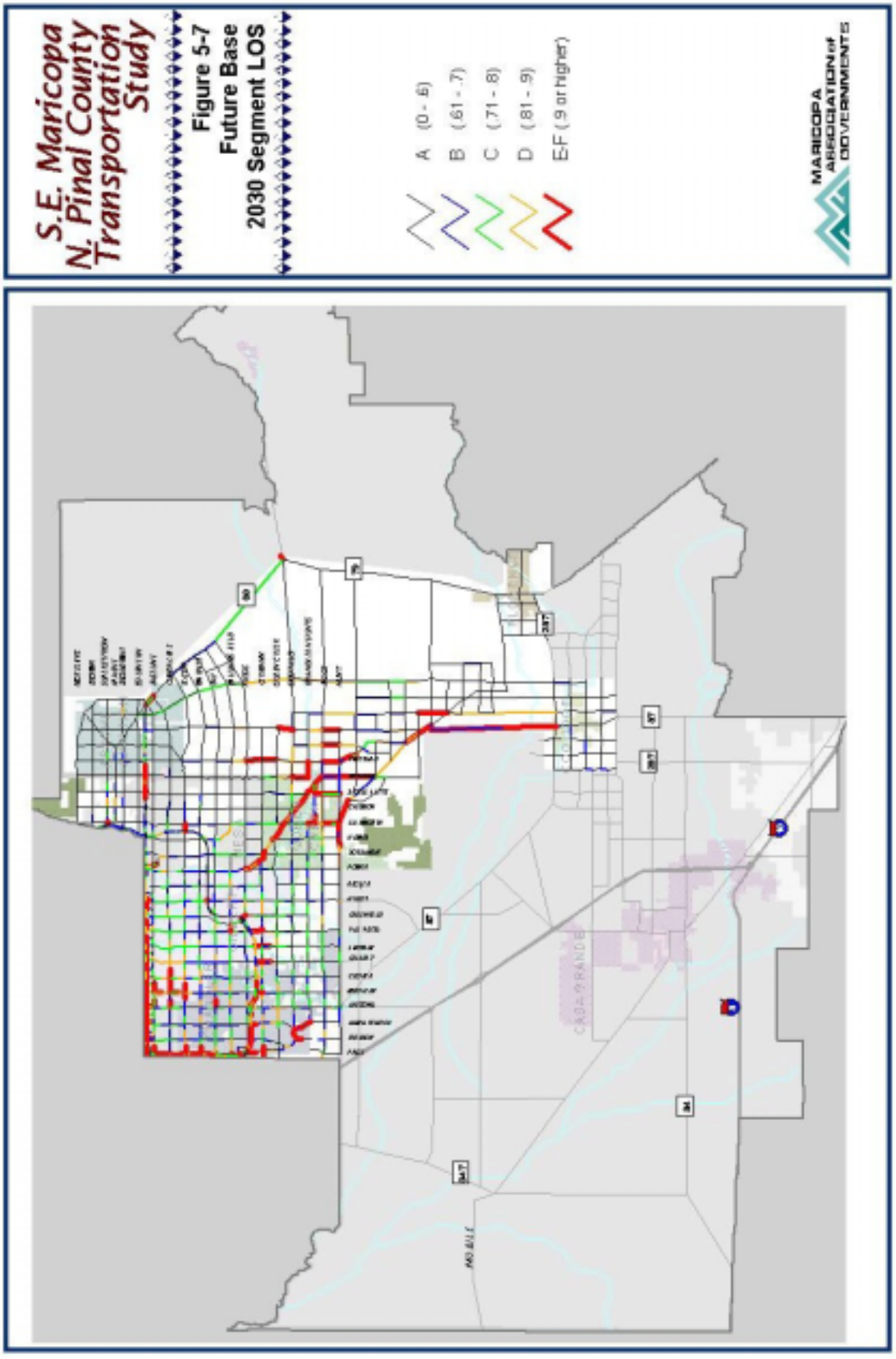
N. Pinal County
Transportation
Study
Figure 5-6
Future Base
2020 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E-F (.9 or higher)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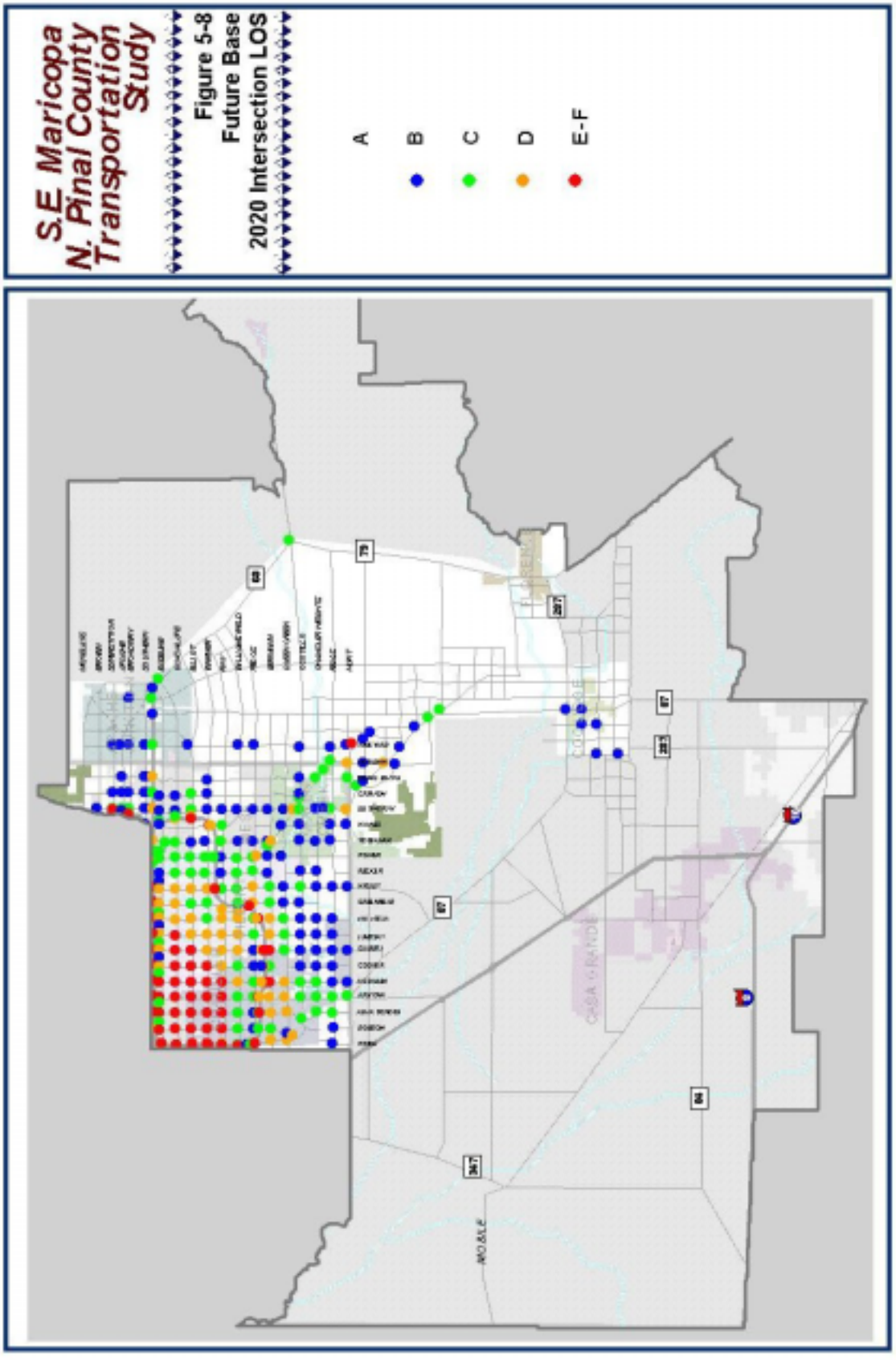
Transportation
Study
Figure 5-7
Future Base
2030 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E-F (.9 or higher)
MARICOPA
ASSOCIATION of
GOVERNMENTS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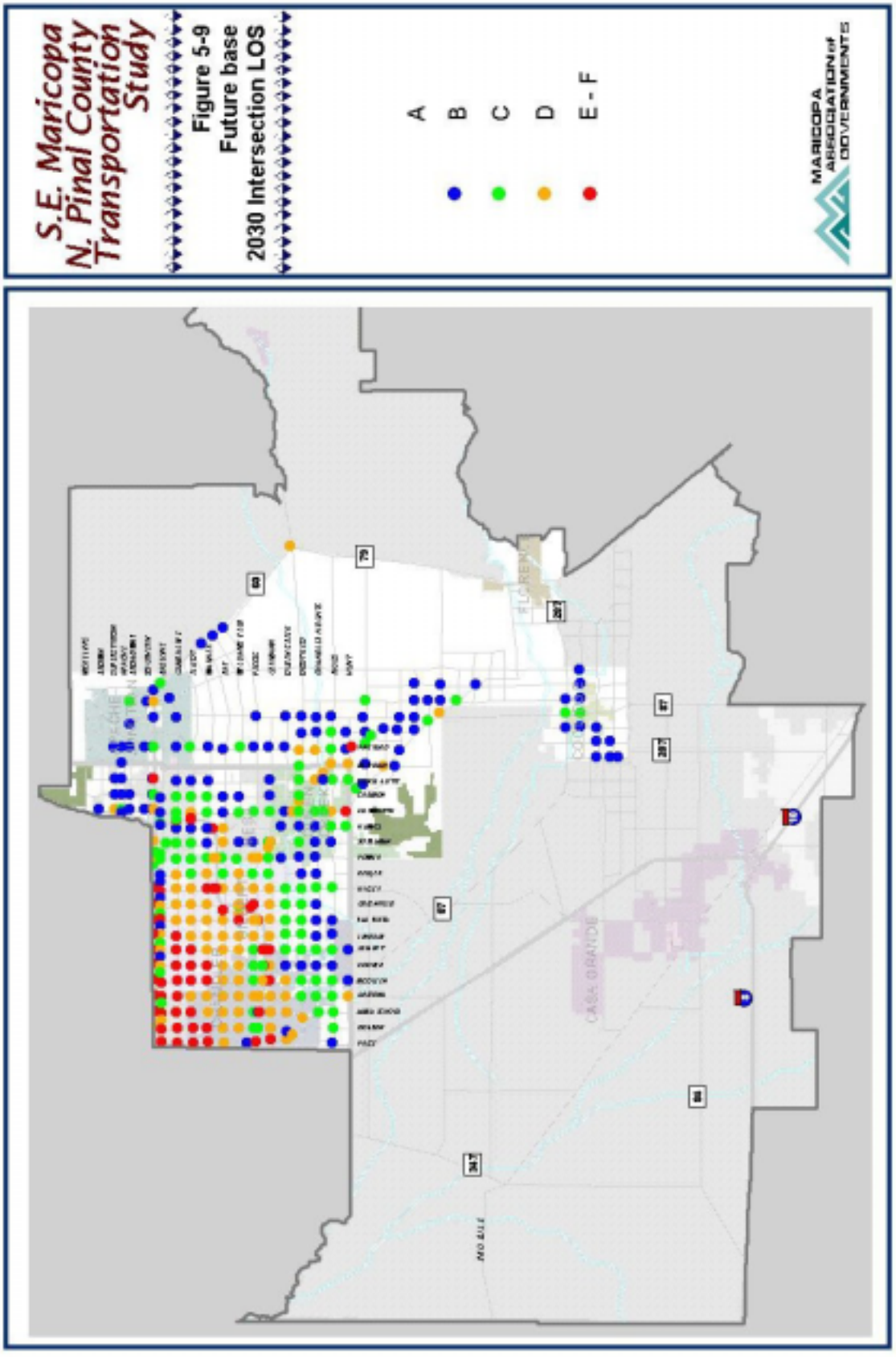
Transportation
Study
Figure 5-8
Future Base
2020 Intersection LOS
A
B
C
D
E-F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N. Pinal County
Transportation
Study
Figure 5-9
Future base
2030 Intersection LOS
A
B
C
D
E - F
MARICOPA
ASSOCIATION of
GOVERNMENTS
FLORENCE
CASA GRANDE
79
93
287
87
347
84

the pattern of intersection level of service varies somewhat between 2020 and 2030, likely in response to changes in travel patterns as the region expands.

j. Roadway Network Summary

A summary of the 2020 and 2030 future base street system statistics and performance for the study area-focus area is presented in Tables 5-1 and 5-2.

A further look at Tables 5-1 and 5-2 can provide some interesting statistics for use in comparing the different network packages. The average number of through lanes per mile on the arterial system is 5.1 in Maricopa County and 4.1 in Pinal County. The average number of lanes per mile on the freeway system is 6.4 in Maricopa County and 4.0 in Pinal County. The average daily volume on the arterial system in 2020 is expected to be 22,100 vehicles in Maricopa County and 9,600 in Pinal County. In 2030, the daily volume is expected to be 25,500 vehicles in Maricopa County and 14,200 in Pinal County. On the freeway system in 2020, the average daily volume is 154,000 in Maricopa County and 41,600 in Pinal County. In 2030, the average daily volume on the freeway system is 131,300 in Maricopa County and 45,000 in Pinal County.

k. Transit

Local transit includes fixed routes that operate on a regular schedule supplemented by shuttles in busy activity centers and circulators to provide mobility within neighborhoods. Rural access transit provides connections from remote areas to the regional and local transit services.

The transit improvements identified for the future base transportation system are expansion to the fixed route transit service to incorporate the new arterial streets into the network when the population density thresholds are satisfied and enhancements to service frequency to meet new demand. The *Regional Transit System Study* being conducted by Valley Metro will provide a recommended transit plan for the Phoenix region including the southeast valley and portions of Pinal County.

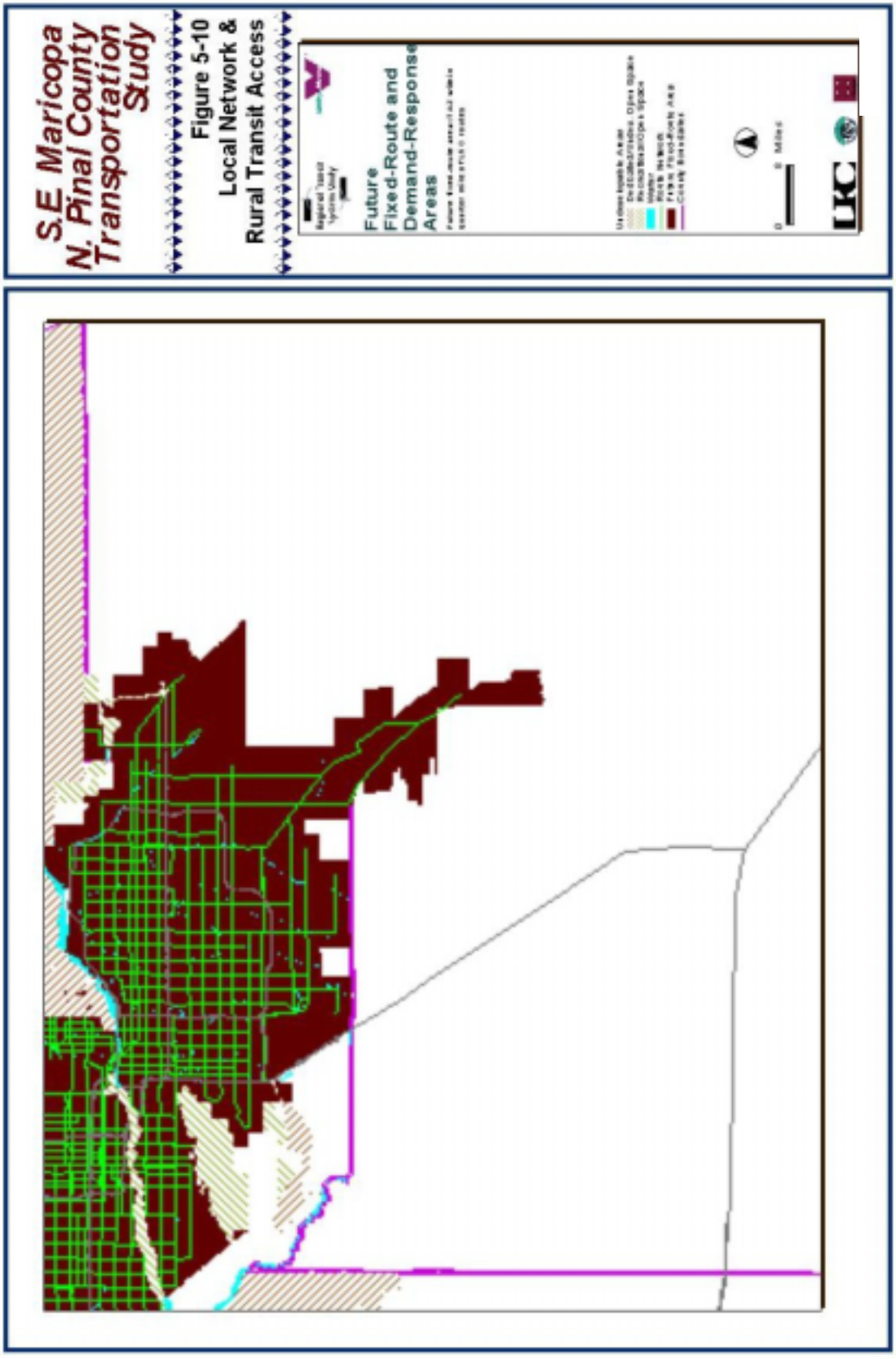
The preliminary results from that study show added fixed routes in southeast Maricopa County and extending into Apache Junction and along the Hunt Highway Corridor. The preliminary routes are shown in Figure 5-10.

TABLE 5-1
YEAR 2020 FUTURE BASE SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	554	482
Freeway & Expressway	63	17
Freeway-HOV	16	0
Total	633	479
LANE MILES		
Arterial	2827	1962
Freeway & Expressway	402	68
Freeway-HOV	34	0
Total	3263	2030
DAILY VMT		
Arterial	12,236,200	4,637,000
Freeway & Expressway	9,828,200	707,500
Freeway-HOV	420,500	160
Total	22,484,900	5,344,660
INTERSECTION LOS		
D	66	3
E	51	0
F	24	1
Percent Congested	36	2
CONGESTED LANE MILES-PM Peak		
Arterial	80	17
Freeway & Expressway	63	1
Freeway-HOV	9	0
Percent Congested	5	1
HOURS OF DELAY-PM Peak		
Arterial	3482	566
Freeway & Expressway	5349	51
Freeway-HOV	221	0
Total	9,052	617
AVERAGE P.M. PEAK SPEED		
Arterial	30	35
Freeway	44	58
Freeway-HOV	52	63

TABLE 5-2
YEAR 2030 FUTURE BASE SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	554	482
Freeway & Expressway	63	17
Freeway-HOV	16	0
Total	633	499
LANE MILES		
Arterial	2827	1962
Freeway & Expressway	402	68
Freeway-HOV	34	0
Total	3263	2030
DAILY VMT		
Arterial	14,102,400	6,824,200
Freeway & Expressway	8,269,200	763,900
Freeway-HOV	480,200	300
Total	22,851,800	7,588,400
INTERSECTION LOS		
D	98	8
E	56	1
F	24	1
Percent Congested	45	5
CONGESTED LANE MILES-PM Peak		
Arterial	103	61
Freeway & Expressway	78	1
Freeway-HOV	11	0
Percent Congested	6	3
HOURS OF DELAY-PM Peak		
Arterial	4842	1536
Freeway & Expressway	6916	132
Freeway-HOV	325	0
Total	12,083	1,668
AVERAGE P.M. PEAK SPEED		
Arterial	28	33
Freeway	40	55
Freeway-HOV	50	63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Transportation
Study
Figure 5-10
Local Network &
Rural Transit Access
Future
Fixed-Route and
Demand-Response
Areas
LKC

The preliminary results of the Regional Transit Study for the Southeast area are summarized in Table 5-3. The future revenue miles needed are based on projected unserved population. The revenue miles are shown for fixed route service, circulators, and rural transit access. The operating cost for a 20-year period is based on $6.73 per revenue mile for 50 percent of the 2030 service level shown in Table 5-3. The 50 percent factor is intended to reflect the average level of service during the 20-year period. It should be noted that the revenue miles shown in Mesa and Chandler are the proportionate share for the study area.

In addition, the capital cost needed to provide this level of service has been estimated to be about one third of the operating cost.

TABLE 5-3
YEAR 2030 LOCAL FIXED ROUTE TRANSIT SERVICE NEED

MPA	Revenue Miles per Day[1]			20 year Operating Cost (mil)[2]	20 year Capital Cost (mil)[2]
	Urban, Fixed-Route	Circulator	Rural Transit Access		
Apache Junction	1,775	542	180	$55	$18
Chandler[3]	7,705	513	0	$180	$60
Gilbert	8,909	350	0	$203	$68
Mesa[3]	6,264	1,119	55	$162	$54
Queen Creek	2,085	731	235	$67	$22
Pinal County	291	8,768	8,862	$392	$131
TOTAL	27,029	12,023	9,332	$1,059	$353

[1]Source: Valley Metro Draft Regional Transit Study, December 16, 2002
[2]Assume 50 percent of 2030 level for 20 years
[3]Includes only that portion in the study area

In addition to fixed route transit service, there is a need to provide special transit services. Paratransit is transit service designed to meet the goals of the American with Disabilities Act (ADA) for persons with disabilities and also provides optional service for seniors. All communities served by fixed route transit must also be served by ADA complementary paratransit. The projected need of ADA and senior citizen paratransit is presented in Table 5-4. The operating cost for a 20-year period is based on $43.83 per hour for 50 percent of the 2030 service level shown in Table 5-4.

TABLE 5-4
PARATRANSIT NEEDS (2030)

MPA	Hours per Day[1]	20-Year Operating Cost (mil)[2]	20 year Capital Cost (mil) [2]
Apache Junction	55	$8	$2
Chandler	95	$14	$5
Gilbert	60	$9	$3
Mesa	496	$71	$24
Queen Creek	15	$2	$1
Pinal County	206	$29	$10
TOTAL	927	$133	$45

[1]Source: Valley Metro Draft Regional Transit Study, December 16, 2002
[2]Assumes 50 percent of 2030 level for 20 years

I. Additional Transportation Needs

The previous discussion as well as the information presented in Chapter 3 identified the deficiencies and issues for the transportation system both now and in the future. Improvements to the arterial street system, both new and widening, were identified in this chapter as part of the future base network.

In this chapter it was shown that the expansion of the arterial street system does not keep pace with development and projected traffic demand. There is still a need to improve existing highways and examine the need for new transportation corridors in order to accommodate the projected travel demand. Improvements to the existing regional facilities are discussed in Chapter 6 while potential new corridors are presented in Chapter 7.

6.0 ENHANCED TRANSPORTATION SYSTEM

The enhanced network includes the future base improvements plus the following.

- Widen existing freeways to add general purpose lanes
- HOV lanes
- Widen state highways
- New interchanges
- Modifications to existing interchanges

The widening is described for study area-model area for continuity purposes, but the statistical summaries and maps are for the study area-focus area.

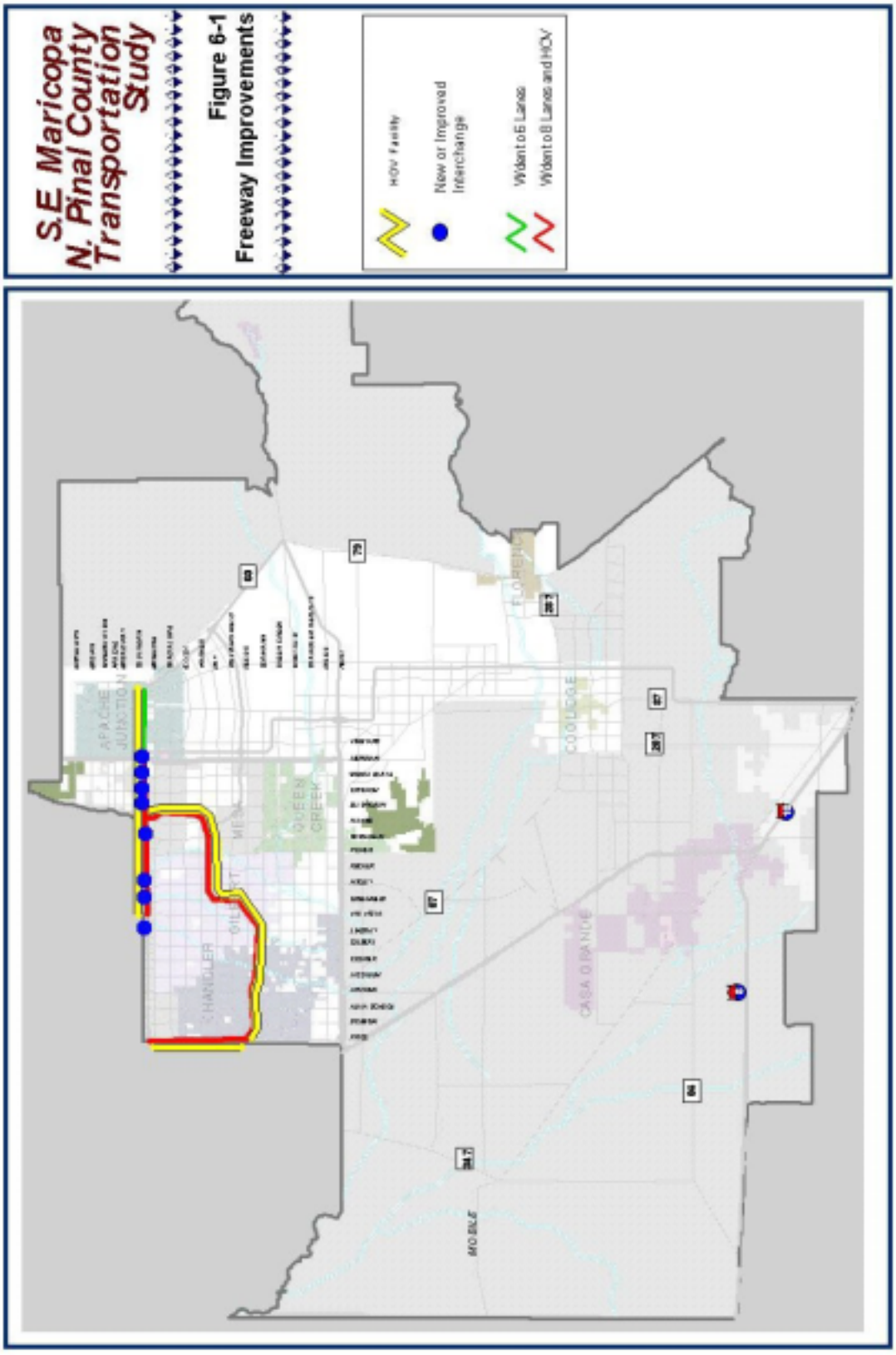
a. Freeway Improvements

Widening was assessed for several freeway facilities in the study area. The widening of a facility could include general-purpose lanes, HOV lanes, or both. In many instances, the widening of an existing freeway can be accomplished with minimal disruption to adjacent land uses and crossroads. The freeways can be widened within the existing right of way and use the existing interchanges and cross road bridges.

The enhanced network includes 45 miles of freeway widening to add a general-purpose lane in each direction and 43 miles of HOV lanes. The widening is shown in Figure 6-1 and described in the following sections. The estimated cost for the freeway widening is $666 million with $610 million in Maricopa County and $56 million in Pinal County. In addition, the enhanced network includes two new traffic interchanges on US 60, modifications to six interchanges along US 60, and one HOV direct connection between US 60 and Loop 202. The estimated cost for the new and modified interchanges is $109 million.

US 60 (Gilbert to Val Vista)

US 60 is currently five through lanes plus an HOV lane in each direction from Loop 101 at the edge of the study area to Gilbert Road. East of Gilbert Road to Val Vista Drive, there are four general-purpose lanes and an HOV lane in each direction. This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Transportation
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Figure 6-1
Freeway Improvements
HOV Facility
New or Improved
Interchange
Widen to 6 Lanes
Widen to 8 Lanes and HOV

widening would provide an additional general-purpose lane eastbound and westbound to match the section to the west.

The widening extends for two miles. The estimated cost of the widening is $16 million.

US 60 (Val Vista to Loop 202)

East of Val Vista to the future Loop 202 alignment (between Hawes and Ellsworth Roads), there are currently three general purpose lanes in each direction: The widening of this six-mile segment will provide five general purpose lanes and one HOV lane in each direction. The HOV lanes will extend the overall HOV system and provide increased opportunities for carpooling and express bus service on the east side of the metropolitan area.

The overall cost of this widening, including both the general purpose lanes and the HOV lanes is $132 million and includes widening through the freeway-to-freeway interchange at Loop 202 and providing direct HOV connections between US 60 and Loop 202.

US 60 (Loop 202 to Signal Butte Road)

This section of US 60 is east of Loop 202 in Maricopa County and continues east three miles. Currently, there are three lanes in each direction. The widening will provide eight lanes with HOV lanes.

The widened facility would serve traffic within the growing areas of eastern Maricopa County, Apache Junction, and northern Pinal County. Currently, there are not any HOV facilities in the area as an alternative to the single occupant vehicle. Park and ride lots should be developed in the corridor to complement the HOV lane construction.

The overall cost of this widening, including both the general-purpose lanes and the HOV lanes is $42 million.

US 60 (Signal Butte to Goldfield Road)

US 60 from Signal Butte to Goldfield Road is a four lane freeway. East of Goldfield Road, the freeway transitions to a four lane divided highway. This section of US 60 crosses boundary of Maricopa and Pinal Counties at Meridian Road. The widening would provide three through lanes and an HOV lane in each direction.

The widening will continue the HOV lanes into Pinal County. Park and ride lots should be developed in the corridor to complement the HOV lane construction.

The overall cost of this five-mile widening, including both the general-purpose lanes and the HOV lanes is $70 million.

Loop 202 (Loop 101 to University Dr)

Loop 202 between Loop 101 and University Drive is being built as a six-lane facility with three general-purpose lanes in each direction. The design of the facility includes provisions for future widening such as leaving open space within the median and building the crossroad bridges wide enough to accommodate the future lanes.

The widening of this facility will provide a fourth lane and an HOV lane in each direction. The length of the widening is 22 miles and would include HOV connections between Loop 202 and Loop 101 at the west end and between Loop 202 and US 60 on the east end. The HOV lane improvements will provide a complete system on Loop 202 from I-10 in Phoenix through Tempe, Mesa, Gilbert, and Chandler.

The estimated cost of the widening is $308 million.

Loop 101 (US 60 to Loop 202 [south])

Loop 101 has been constructed through the study area. The current facility has three lanes in each direction. This widening will provide an additional through lane and HOV lane in each direction between US 60 and Loop 202. The widening serves commuters traveling to and from Chandler.

The widening is seven miles in length and includes modifying the Loop 101 and US 60 interchange in Tempe. The estimated cost of construction is $98 million.

Freeway Widening Summary

The following table presents a summary of the miles and costs for the widened freeway facilities.

TABLE 6-1
SUMMARY OF FREEWAY WIDENING

	LENGTH (mi)	FREEWAY LANES ADDED	HOV LANES ADDED	CONSTRUCTION COST ($millions)
US 60: *Gilbert to Val VIsta*	2	2		$16
US 60: *Val Vista to Loop 202*	6	4	2	$132
US 60: *Loop 202 to Signal Butte*	3	2	2	$42
US 60: *Signal Butte to Goldfield*	5	2	2	$70
Loop 202: *(Loop 101 to University Dr)*	22	2	2	$308
Loop 101: *US 60 to Loop 202 (south)*	7	2	2	$98
TOTAL	43			$666

New and Reconstructed Interchanges

The enhanced network includes new interchanges, modifications to existing interchanges, and an HOV direct connection. The locations are shown on Figure 6-1.

There are two new interchanges proposed for US 60 at Lindsay Road in Mesa and at Meridian Road in Apache Junction. The estimated cost is $20 million. The Lindsay Road location would relieve congestion on adjacent interchanges. The Meridian Road interchange would provide an additional access point for Apache Junction traffic.

There are six interchanges that would be reconstructed on US 60 located at Greenfield Road, Higley Road, Power Road, Ellsworth Road, Crismon Road, and Signal Butte Road. The reconstruction is estimated to cost $3 million per interchange for a total of $18 million in interchange reconstruction.

Another future need for interchange improvements may occur along portions of the Red Mountain and San Tan Freeways now under construction. There may be a need to construct additional turn lanes at some locations in the future. These new sections of freeway are designed and constructed with future widening considered. Assuming that half of the 24 planned interchanges need improvement at $1.5 million each, then there would be an additional need for $18 million.

An HOV direct connection would be provided between US 60 and Loop 202 and Loop 202 and Loop 101 at a cost of $35 million each. The total estimated cost of the interchange improvements is $126 million.

b. Freeway Operational Improvements

The ADOT Freeway Management System (FMS) employs many of the Intelligent Transportation System (ITS) technologies. The system includes fiber optic communications, ramp metering, CCTV cameras, vehicle detectors, and variable message signs. There are 66 miles of freeway currently in operation. ADOT has made a commitment to ITS and maintaining the FMS and will continue to add ITS features to the existing system. New sections of freeway will be designed and constructed with the ITS elements included. ADOT estimates the cost for these facilities on the freeway system to be $1 million per mile. For the focus area, the total cost would be $67 million.

Another freeway operational feature that is currently in use is the Freeway Service Patrol. It is a cooperative effort among DPS, AAA of Arizona, MAG, and ADOT. Trained personnel use specially equipped vehicles to assist stranded motorists and remove road hazards. The service is available 18 hours a day, seven days a week. ADOT has programmed this service through the year 2007. As freeways volumes grow and become more congested, it will be important to continue and expand this service.

c. Freeway Mitigation/Aesthetics

As freeways are built and widened, it is important to mitigate potential negative impacts and to provide positive aesthetic treatments. A major freeway mitigation issue is noise. This can be addressed with the construction of noise walls or berms and with the use of rubberized-asphalt for the riding surface. These mitigation items are usually included in the cost of a new facility. However, there are existing freeways in Maricopa County that are being retrofitted with rubberized asphalt. Also, land uses adjacent to freeways can change over time and as a result additional mitigation treatments may need to be added years after a facility is constructed.

In addition, aesthetics treatments are often included within the freeway right of way. Landscaping is a common treatment. The landscape elements vary depending on the facility design. Also, the landscape can be phased depending on available. Another aesthetic treatment that is being incorporated in to freeway design is the color and design of wall fascia. Adjacent communities are often involved in the design and cost of the walls.

d. Freeway Maintenance

In order to maintain the integrity of the freeway system, the facilities need to be maintained to acceptable service conditions. Freeway maintenance includes providing a satisfactory riding surface for the traveling public. The roadway surface should be kept relatively clean with minimal cracking and rutting. If the surface is maintained, the frequency of reconstruction can be minimized.

The term maintenance also includes litter control, service patrols, and landscape maintenance.

e. State Highway Widening

A number of state highways were identified as candidates for widening. These are shown in Figure 6-2 and described in the following sections.

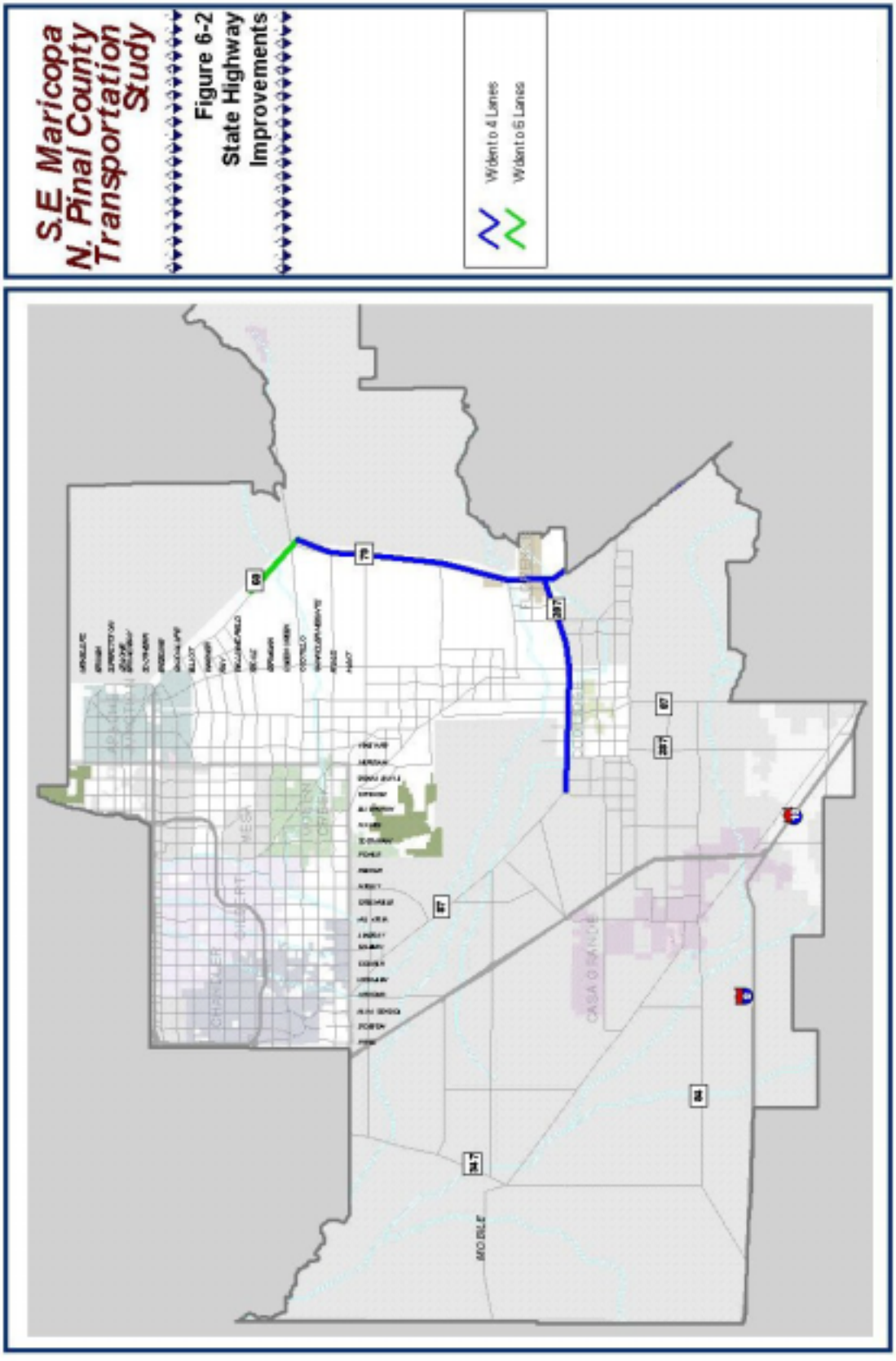
US 60 (Ray Road to Florence Junction)

This section of US 60 begins at the east end of the proposed US 60 bypass and continues to Florence Junction (SR 79), a length of approximately eight miles. It is currently a four-lane divided highway with direct access and at-grade intersections. The concept would be to widen this section to three lanes in each direction to develop a controlled access corridor with future TI's.

This section of US 60 serves a rapidly developing area that has the potential to experience even more significant growth as a substantial amount of State Land to the south could be developed. Currently, the MAG travel forecasting model shows a future volume of 36,000 vehicles per day in 2030, however, this does not include any development southwest of US 60 on the State Land parcel. The estimated cost for widening this portion of US 60 is $28 million.

SR 79 (Florence Junction to focus area boundary)

This section of SR 79 begins at Florence Junction (US 60) and continues south to the focus area boundary near SR 287, a length of approximately 17 miles. It is currently a two-lane highway with direct access and at-grade intersections. The concept is to widen this section to two lanes in each direction.


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 6-2
State Highway
Improvements
Widen to 4 Lanes
Widen to 6 Lanes
60
79
287
87
347
MOBILE
CASA GRANDE

This section of SR 79 is the primary highway connection between eastern Maricopa County and northern Pinal County. Currently, the MAG travel forecasting model shows a future volume that ranges from 10,000 to 19,000 vehicles per day in 2030; however, this does not include any development to the west on the State Land parcel.

The estimated cost for widening this portion of US 60 is $59.5 million.

SR 287 (SR 87 to SR 79)

This section of SR 287 begins at SR 87 (Arizona Boulevard) and continues east to SR 79 a length of approximately 10 miles. It is currently a two-lane highway with direct access and at-grade intersections. The concept is to widen this section to two lanes in each direction. This portion of SR 287 currently has a railroad overpass just east of SR 87, which would either have to be widened or require an additional bridge for the new two lanes.

Along with SR 87, this section of SR 287 is the primary highway connection between the Casa Grande area, Coolidge, and Florence. Currently, the MAG travel forecasting model shows a future volume that ranges from 2,000 to 16,000 vehicles per day in 2030.

The estimated cost for widening this portion of US 60 is $36 million, which includes the additional railroad crossing.

SR 87 (SR 387 to SR 287)

This section of SR 87 begins at SR 387 and continues to SR 87 (Arizona Boulevard)/SR 287, a length of approximately eight miles. It is currently a two-lane highway with direct access and at-grade intersections. The concept is to widen this section to two lanes in each direction.

This section of SR 87 is a continuation of SR 87 from Maricopa County and provides several connections to I-10. It is the primary highway corridor across the Gila River Indian Community. Currently, the MAG travel forecasting model shows a future volume that ranges from 14,000 to 24,000 vehicles per day in 2030.

The estimated cost for widening this portion of US 60 is $28 million.

f. Highway Interchanges

There are highway locations where traffic interchanges may be considered at some point in the future. The need to consider a grade separation at the intersection of two highways may be a result of volume, accident experience, or the need to maintain route continuity. It should be noted that a grade separation is already under construction at US 60 and SR 79 (Florence Junction).

Potential locations are:

- SR 287 and Main Street – Florence
- SR 287 and SR 87
- SR 87 and SR 587
- US 60: Ray Road to Florence Jct. (5 locations)

The estimated cost for a highway interchange is $10 million for a total cost of $30 million for the focus area.

The highway widening and interchange projects are summarized in Table 6-2.

TABLE 6-2
SUMMARY OF HIGHWAY IMPROVEMENTS

	SEGMENT LENGTH (mi)	NUMBER OF LANES ADDED	COST ($millions)
US 60 (Ray Road to Florence Jct.) & five new TI's	8	2	$88
SR 79 (Florence Jct. To Focus Area Boundary)	17	2	$60
SR 287 (SR 87 to SR 79) & two new TI's	10	2	$56
SR 87 (SR 387 to SR 287) & one new TI	8	2	$38
TOTAL	43		$242

g. Roadway Network Operations

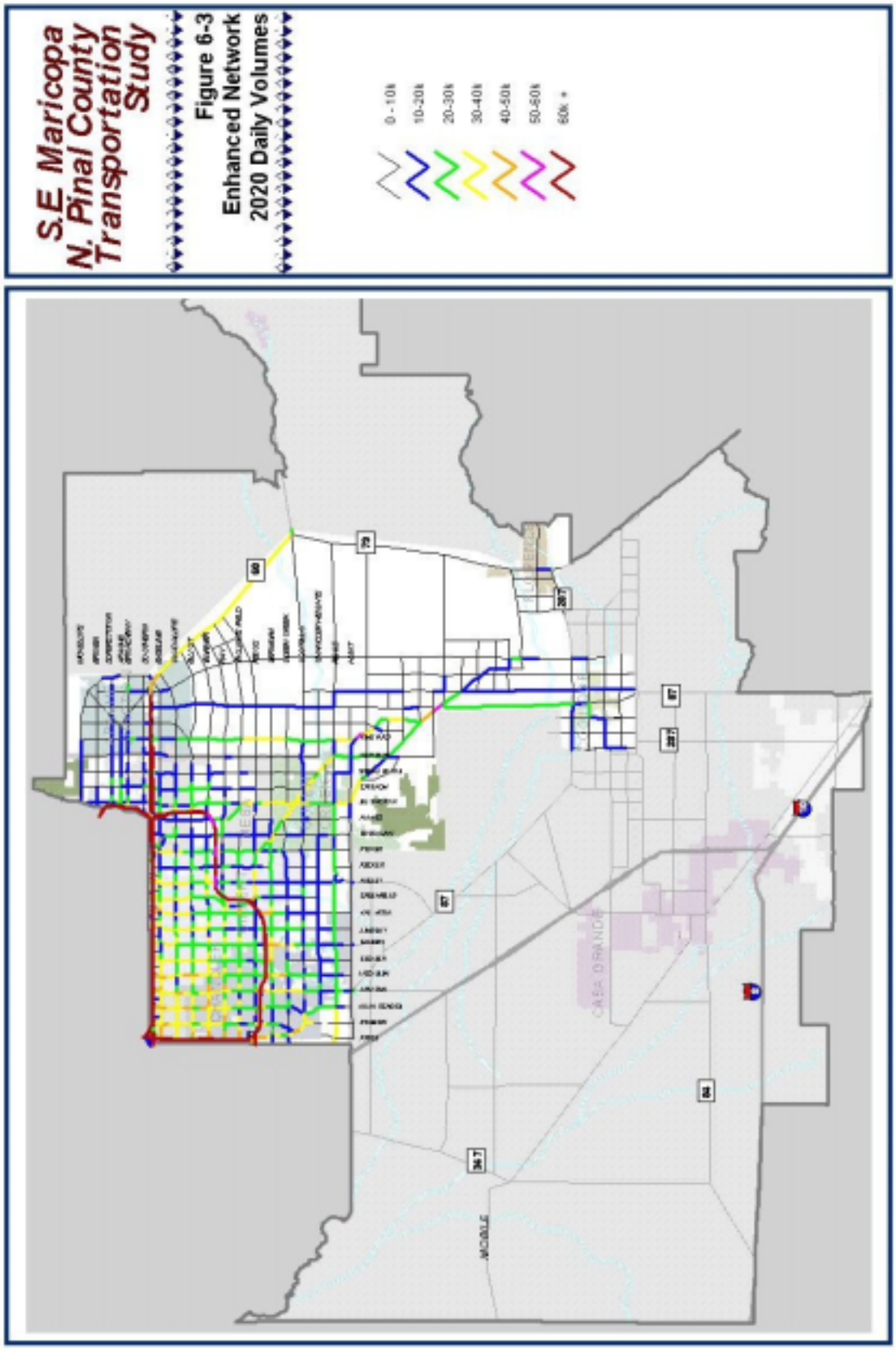
The 2020 and 2030 traffic forecasts for the enhanced network are presented in Figures 6-3 and 6-4. A comparison of Figures 6-3 and 6-4 shows that volume increases occur throughout the study area, but particularly in Pinal County.

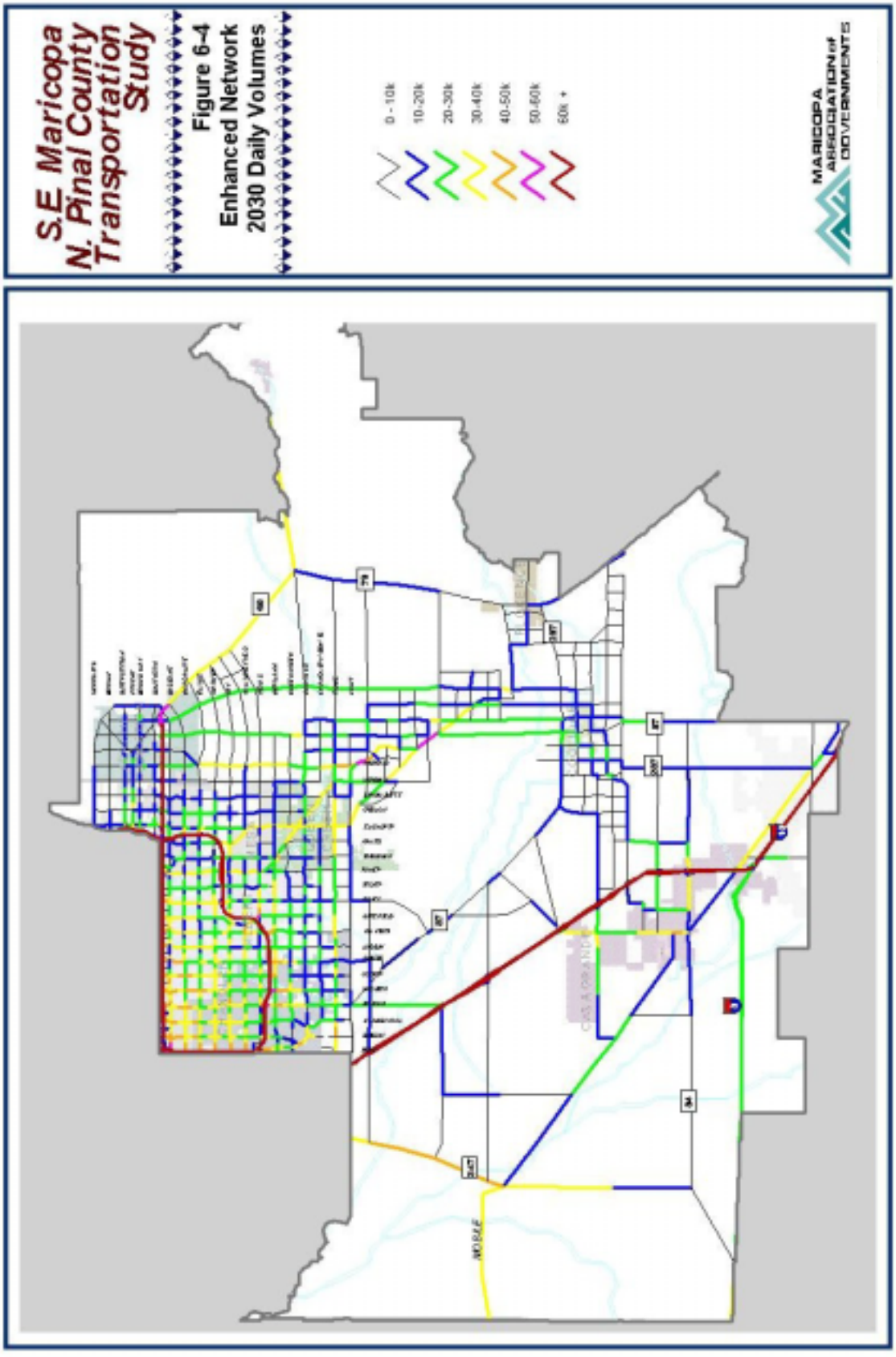
The year 2020 and 2030 level of service for roadway segments within the focus area is shown in Figures 6-5 and 6-6. The level of service for intersections is shown in Figures 6-7 and 6-8 for the years 2020 and 2030 respectively. While the level of service is slightly worse in 2030 than 2020 for the enhanced network, the level of service for either 2020 or 2030 is slightly better compared to the future base network.

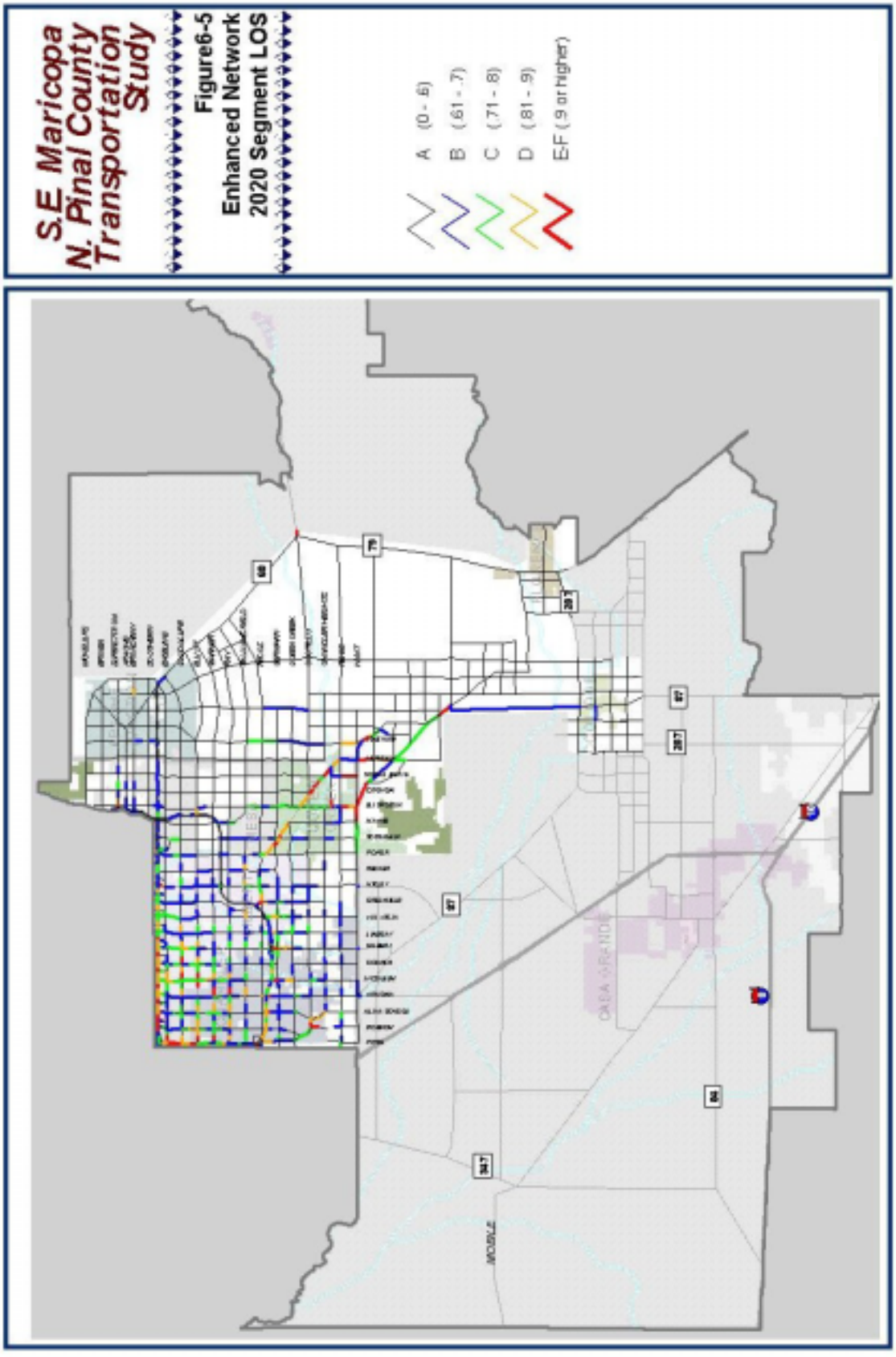
h. Roadway Network Summary

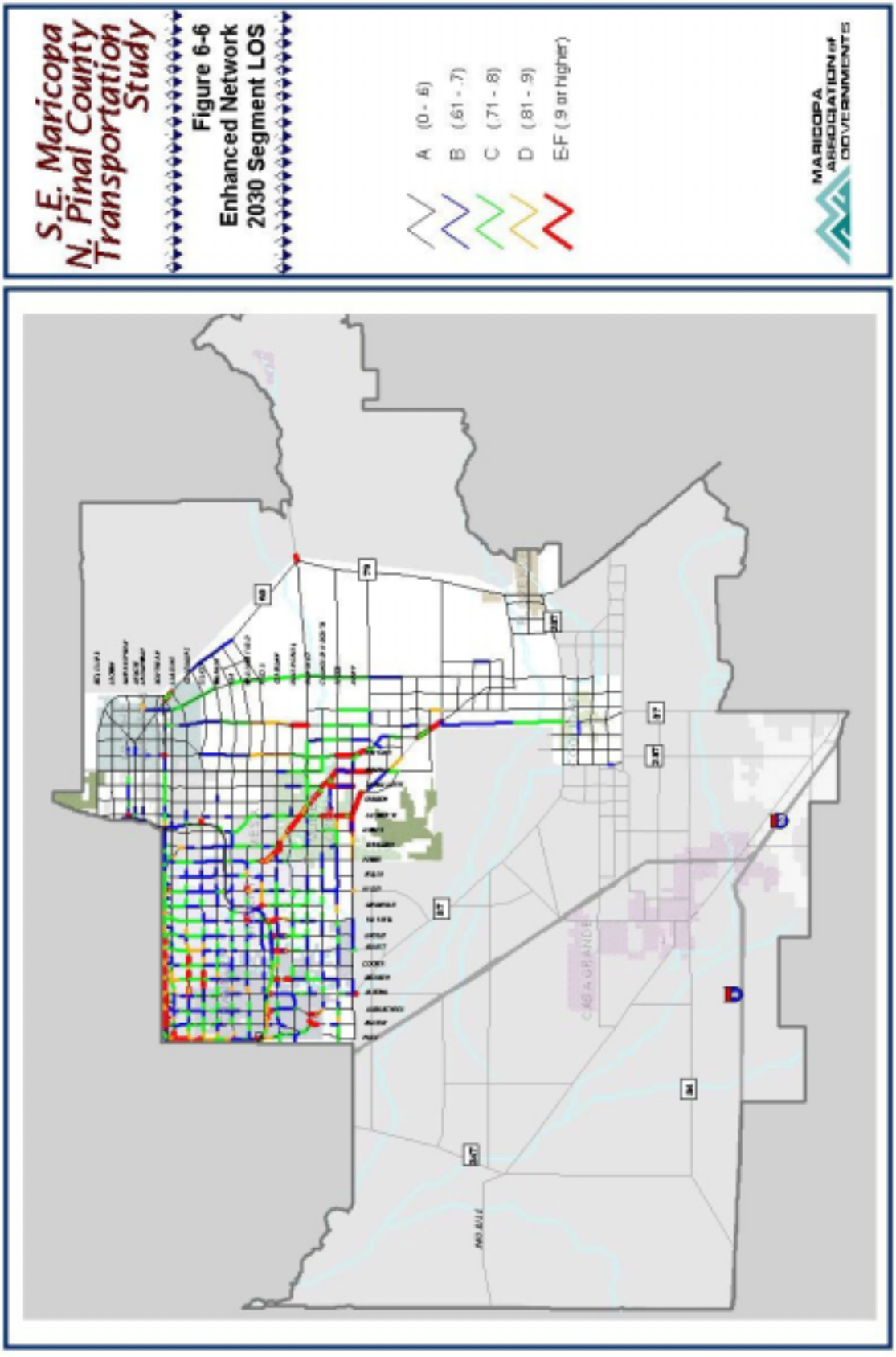
A summary of the 2020 and 2030 enhanced street system statistics and performance for the study area-focus area is presented in Tables 6-3 and 6-4. As can be seen, the street network remains the same between 2020 and 2030, but the amount of travel and congestion increases to reflect continued growth. The vehicle miles of travel increases by about two million vehicle miles in both Maricopa and Pinal counties. This represents a 10 percent increase in Maricopa County and a 42 percent increase in Pinal County. The percent of congested intersections increases from 31 to 38 in Maricopa County and from two to four in Pinal County.

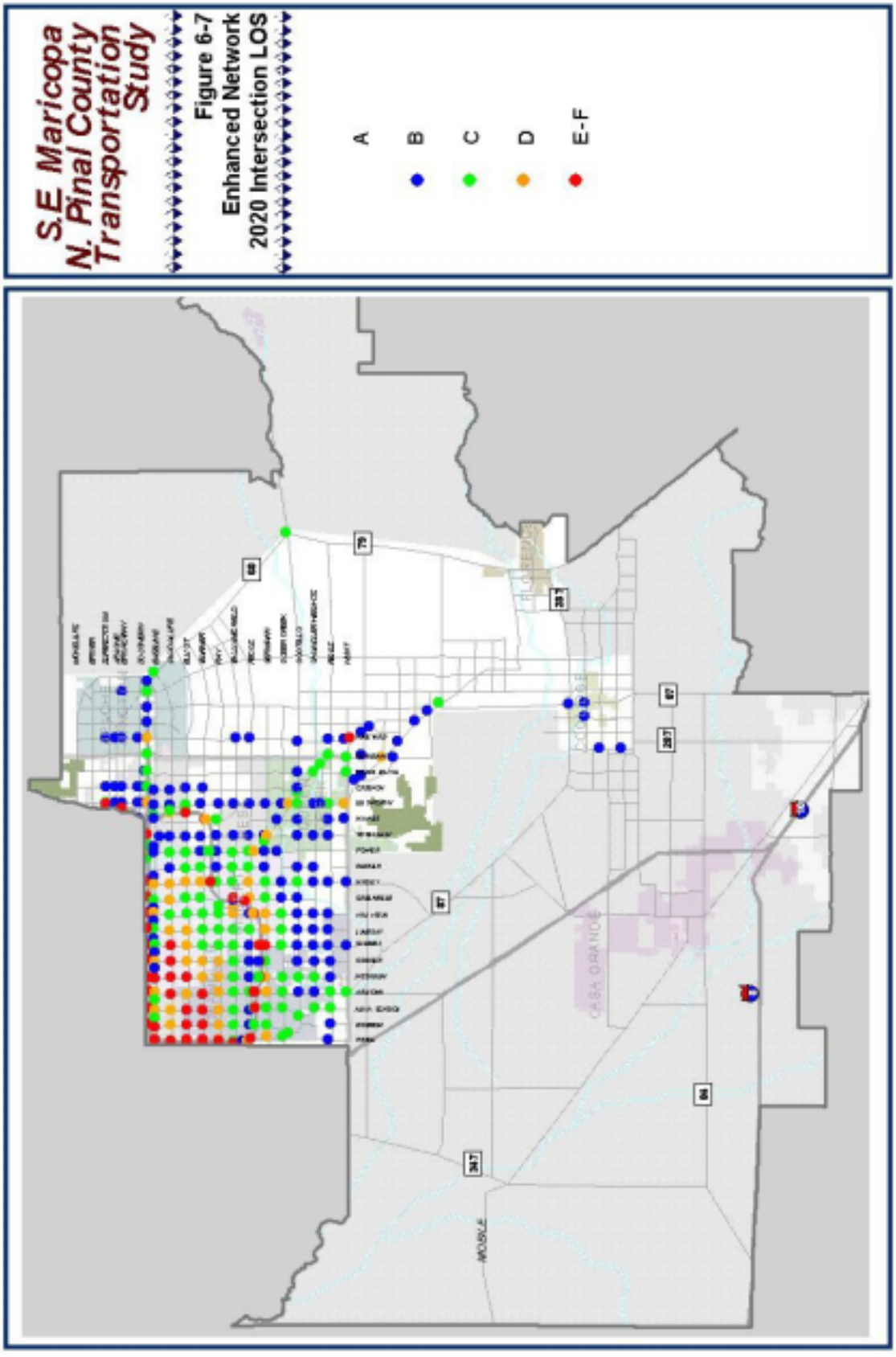
The average number of through lanes on the arterial system remains unchanged compared to the future base. The average number of lanes per mile on the freeway system increases to eight in Maricopa County and 5.2 in Pinal County. The average daily volume on the arterial system in 2030 is expected to be 23,000 vehicles in Maricopa County and 11,900 in Pinal County. On the freeway system in 2030, the average daily volume is 147,300 in Maricopa County and 50,100 in Pinal County. Compared to the future base, this represents a shift in travel from the arterial streets to the freeway system.


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 6-3
Enhanced Network
2020 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
CASA GRANDE
MIDDLE


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 6-4
Enhanced Network
2030 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E Maricopa
N. Pinal County
Transportation
Study
Figure6-5
Enhanced Network
2020 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E-F (.9 or higher)


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 6-6
Enhanced Network
2030 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E-F (.9 or higher)
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 6-7
Enhanced Network
2020 Intersection LOS
A
B
C
D
E-F
79
60
287
87
347
CASA GRANDE
MARICOPA

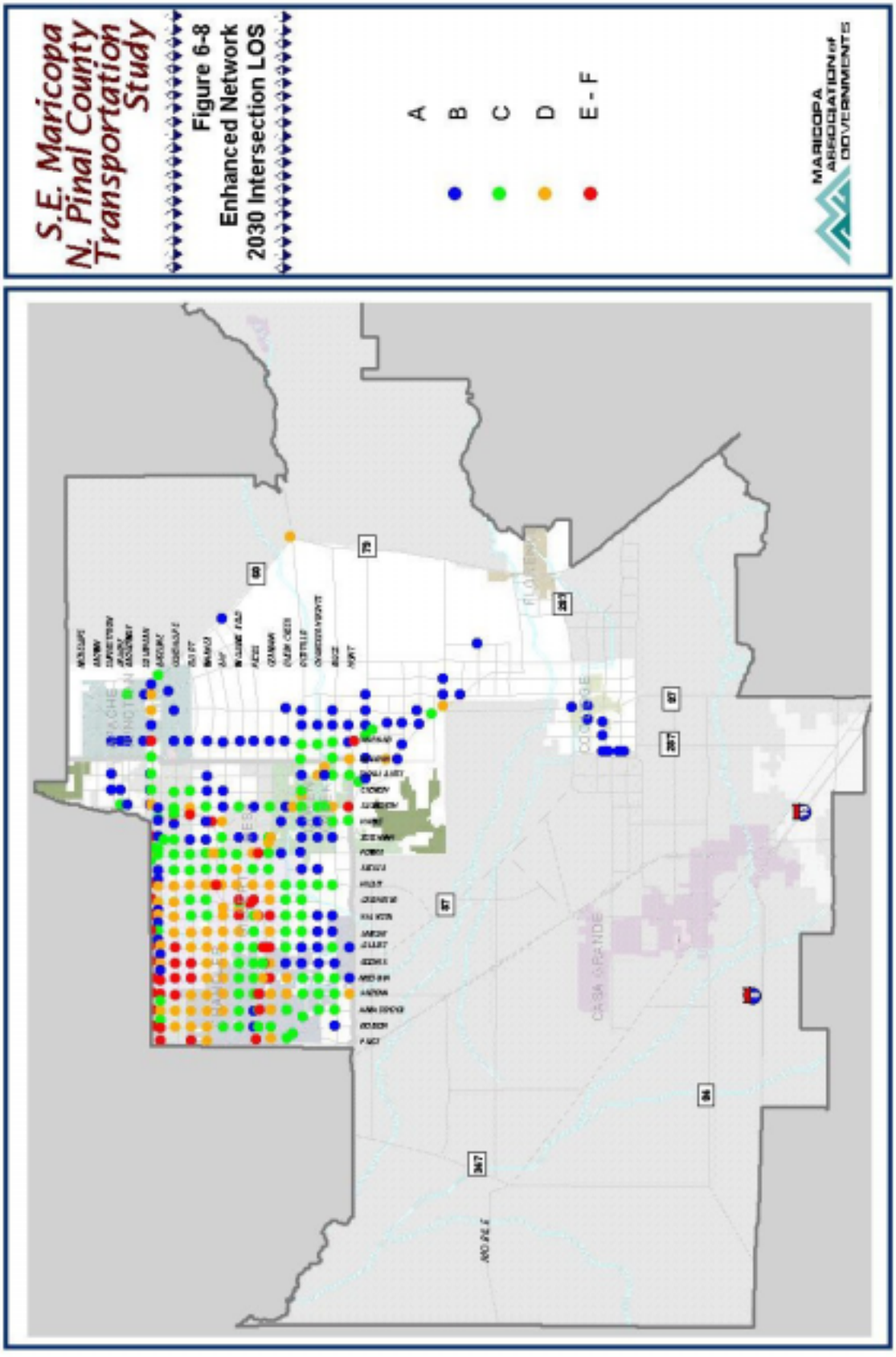

S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 6-8
Enhanced Network
2030 Intersection LOS
A
B
C
D
E - F
MARICOPA
ASSOCIATION of
GOVERNMENTS

TABLE 6-3
YEAR 2020 ENHANCED SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	554	482
Freeway & Expressway	63	17
Freeway-HOV	58	4
Total	675	503
LANE MILES		
Arterial	2827	1962
Freeway & Expressway	504	88
Freeway-HOV	116	8
Total	3,447	2,058
DAILY VMT		
Arterial	11,318,300	3,884,400
Freeway & Expressway	8,631,900	757,500
Freeway-HOV	564,500	5400
Total	20,514,700	4,647,300
INTERSECTION LOS		
D	53	3
E	41	0
F	28	1
Percent Congested	31	2
CONGESTED LANE MILES-PM Peak		
Arterial	51	12
Freeway & Expressway	37	1
Freeway-HOV	5	0
Percent Congested	3	1
HOURS OF DELAY-PM Peak		
Arterial	2536	442
Freeway & Expressway	3903	41
Freeway-HOV	80	0
Total	6,519	483
AVERAGE P.M. PEAK SPEED		
Arterial	30	36
Freeway	49	63
Freeway-HOV	58	63

TABLE 6-4
YEAR 2030 ENHANCED SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	554	482
Freeway & Expressway	63	17
Freeway-HOV	58	4
Total	675	503
LANE MILES		
Arterial	2827	1962
Freeway & Expressway	504	88
Freeway-HOV	116	8
Total	3,447	2,058
DAILY VMT		
Arterial	12,766,100	5,756,600
Freeway & Expressway	9,282,000	851,100
Freeway-HOV	671,600	7800
Total	22,719,700	6,615,500
INTERSECTION LOS		
D	83	6
E	40	2
F	29	1
Percent Congested	38	4
CONGESTED LANE MILES-PM Peak		
Arterial	66	28
Freeway & Expressway	51	1
Freeway-HOV	6	0
Percent Congested	4	1
HOURS OF DELAY-PM Peak		
Arterial	3378	871
Freeway & Expressway	4802	97
Freeway-HOV	125	0
Total	8,305	968
AVERAGE P.M. PEAK SPEED		
Arterial	29	35
Freeway	47	62
Freeway-HOV	57	63

i. Transit

The additions to the transit system associated with the enhanced network are also taken from the *Regional Transit System Study (RTS)*. These improvements would include park and ride lots, transit centers, BRT/express bus service on the freeway system, and connections to the regional high capacity system.

The addition of HOV lanes on Loop 202, US 60, and Loop 101 will provide opportunities for added express bus service. Additional corridors identified as regional connector routes include Arizona Avenue, Gilbert Road, Power Road, Chandler Boulevard/Williams Field Road, and Germann Road. Additional park and ride lots are shown in the vicinity of Chandler Boulevard and Loop 101, Williams Field Road and Gilbert Road, and Loop 202 and Val Vista Drive. A proposed transit center is shown on Gilbert Road between Guadalupe Road and Elliot Road.

An important supplement to the basic bus grid network is provided by regional express bus service. This service enables transit riders to access key activity centers with less of a travel time commitment than by using the local bus grid. An 85-mile set of express bus routes for the study area would cost approximately $106 million for a 20-year period. This includes $80 million for operating costs and $26 million for capital costs associated with the service.

j. Non-Motorized

One of the major goals of the non-motorized system improvements is to close the gaps that currently exist, implement the bicycle/pedestrian/trail plans of the respective jurisdictions, and provide continuity across municipal boundaries.

In addition to gaps in the non-motorized system, it is important that other transportation facilities do not create unnecessary barriers in the non-motorized system. Freeways, railroads, canals, and wide arterial streets can be considered barriers to bicycle and pedestrian traffic. It is important that these facilities are developed with consideration of the non-motorized user.

The Maricopa County Trail Commission has been working to form a regional trail system. The goals of the program are to connect the County park system, link recreational corridors around the Valley, and help preserve open space in the community. This is an example of how a coordinated plan can support alternative

modes of travel as part of a regional recreational / transportation element. The key to their contribution is in their implementation. Once they are in place, they can serve multiple uses. It also takes a number of communities to agree on the treatment within their areas to raise and maintain support for the project.

Locally, the Town of Florence has designated a system of trails and paths in its General Plan; Pinal County has built 13 miles of the Arizona Trail and a portion of the Superstition Trail in conjunction with Apache Junction, and bike and equestrian trails are included in Queen Creek's General Plan. The City of Mesa has identified a system of bike routes, lanes and shared use paths in its recently completed Transportation Plan.

7.0 NEW CORRIDORS

New freeways can provide a variety of benefits for communities in the East Valley and Northern Pinal County. High capacity highway corridors with controlled access are a vital element of the transportation system in the study area. In general, they carry the longer trips in the area and serve to connect the communities and major activity centers.

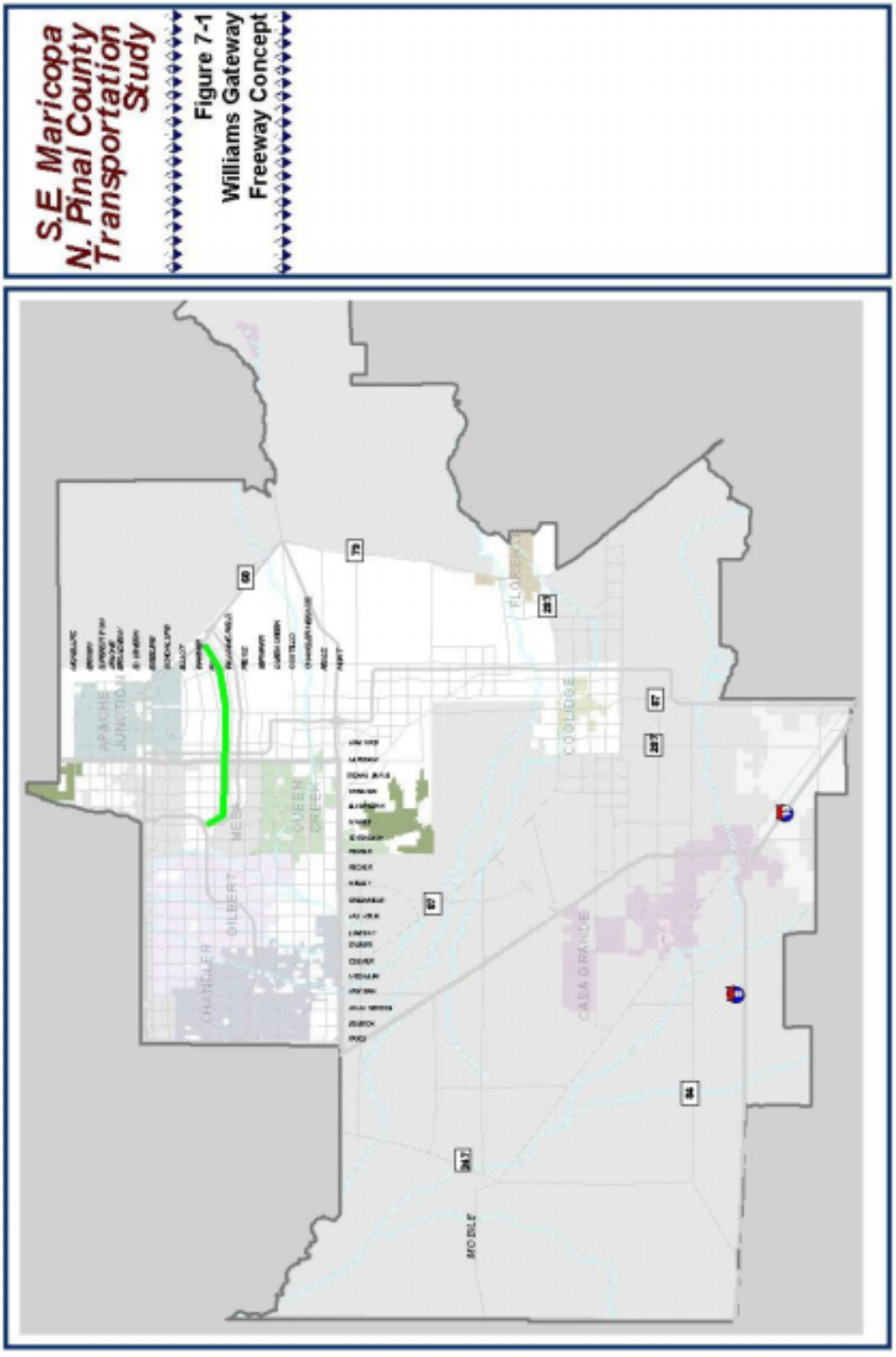
Freeway facilities can provide congestion relief to adjacent parallel arterial streets especially during the peak hours of commuter travel. Properly planned freeway facilities can provide needed access to developing areas and support economic development. Also, a freeway facility provides the infrastructure necessary to accommodate HOV lanes and express bus service.

Five potential new freeway corridors were analyzed for the Southeast Area. These potential corridors include both general-purpose lanes and HOV lanes. The new corridors assume that the future base and enhanced improvements are in place. These corridors are described in the following sections.

If constructed, these new facilities could be built in phases rather than constructed for their entire length as one project. For example, each facility could be built in segments of five to seven miles in length. Another option for phasing the construction is to build less than the ultimate the number of lanes. If the facility is to be three lanes in each direction with grade separated interchanges, an initial phase could be two lanes in each direction with limited at-grade intersections. In addition, while these corridors were analyzed as freeway facilities, they could be developed as expressways or high-level arterials.

a. Williams Gateway Freeway (Loop 202 to US 60)

The Williams Gateway Freeway corridor is located in southeast Mesa near Williams Gateway Airport. The freeway would begin at Loop 202 near the Hawes Road interchange and extend southeasterly into Pinal County and connect to US 60. The freeway would provide three lanes in each direction with grade-separated interchanges spaced 1-2 miles apart. The general location is shown in Figure 7-1.


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 7-1
Williams Gateway
Freeway Concept
APACHE JUNCTION
QUEEN CREEK
MESA
CHANDLER
GILBERT
FLORENCE
COOLIDGE
CASA GRANDE
MOBILE

The freeway would serve the Williams Gateway Airport and ancillary developments, the General Motors site (scheduled for re-development), and potential developments on State Land in Pinal County. The majority of the land in the corridor is currently vacant. The freeway could serve as a link between the emerging development areas at the county boundary. The freeway could be phased to keep pace with the developments. This freeway is included in the Mesa Transportation Plan as a facility that provides regional access to the planned employment hub in this part of this City.

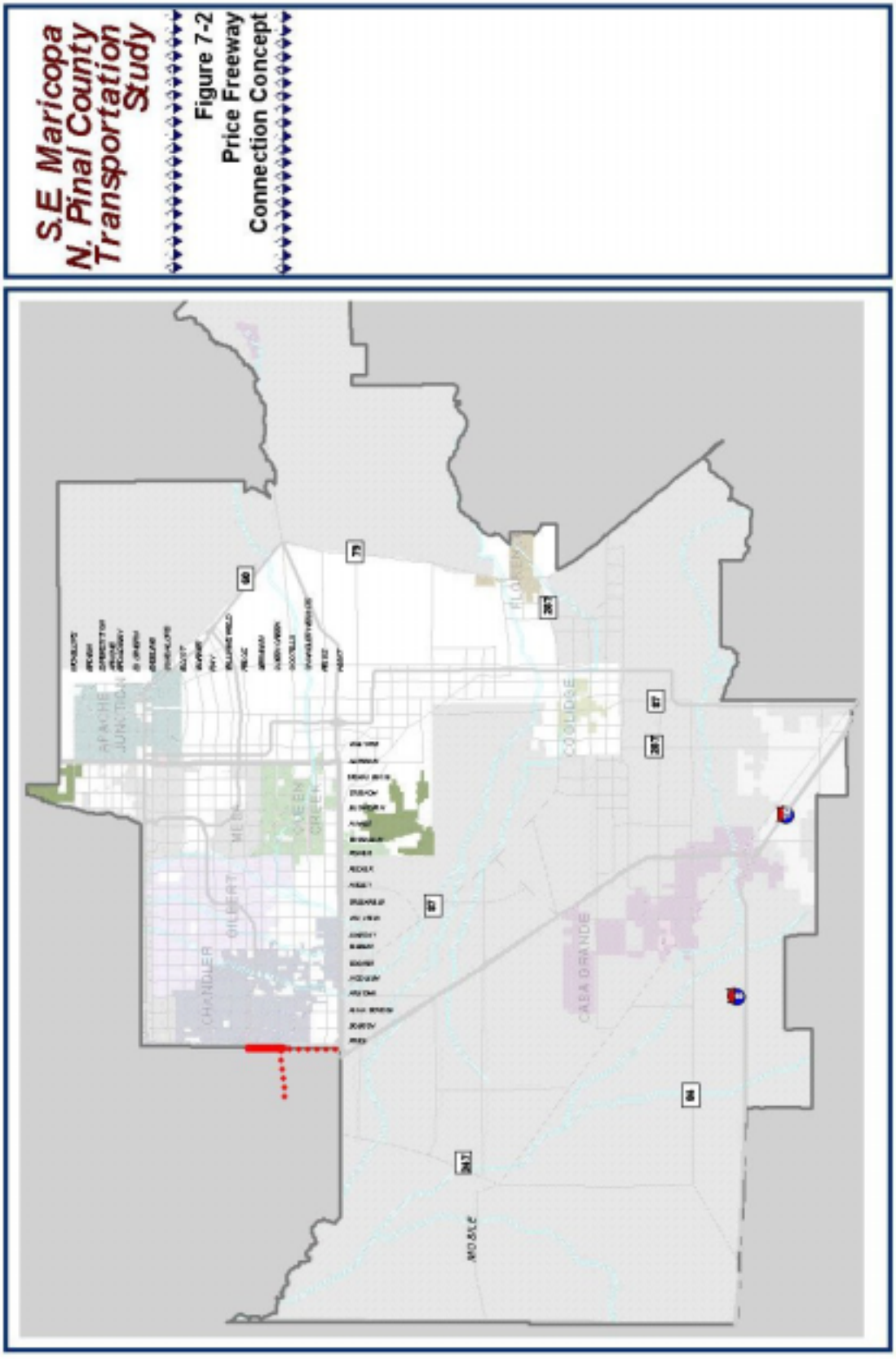
The Williams Gateway Freeway would be approximately 15 miles in length with six miles in Maricopa County and nine miles in Pinal County. The alignment includes a crossing of the Central Arizona Project. This facility is expected to carry daily traffic volumes in the range of 60,000 to 100,000 vehicles in the Maricopa County area based on 2030 projections. It should be noted that revised population projections being prepared for the Northern Pinal County area covering the State Land property would likely result in higher traffic volume projections. The estimated construction cost of the Williams Gateway Freeway is $750 million.

b. Price Freeway Connection (Loop 202 to I-10)

The Price Freeway Connection would extend Loop 101 from its current terminus at Loop 202 in Chandler south to I-10. The extension would continue the three lanes in each direction to match the existing section to the north. The general location is shown in Figure 7-2.

With the current system, traffic traveling between I-10 and Loop 101 in the East Valley has to exit I-10 onto Loop 202 and then exit Loop 202 to Loop 101. The concept of the Price Freeway Connection is to provide direct access between I-10 and Loop 101. This facility would also provide improved access to Memorial Airfield on the Gila River Indian Community.

Two potential alignments have been reviewed for the extension and are shown as dotted lines on the map. One would extend Loop 10 straight south and connect to I-10 in the vicinity of Hunt Highway. This location is on the boundary between Chandler and the Gila River Indian Community. Depending on which side of the boundary the facility was located, it could be disruptive to existing residential and industrial developments. The other alignment extends Loop 101 south from Loop 202 to Queen Creek Road. At this point, the facility would turn to the west and follow the existing Queen Creek Road alignment across the Gila River Indian Community to I-10.


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-2
Price Freeway
Connection Concept

The existing interchange would be modified to function as a freeway to freeway interchange. This alignment of the extension would reduce the potential impacts on existing development compared to the one which continues straight south.

With either alignment, the Price Freeway Connection would be approximately six miles in length and carry an estimated 96,000 to 140,000 vehicles daily. The construction cost is projected to be $390 million including the freeway to freeway interchange and $60 million as an expressway/controlled access arterial.

c. US 60 Freeway Extension (Baseline to Ray)

This potential freeway is an extension of the US 60 freeway from its current terminus at Goldfield Road to the southeast. The facility would parallel the existing US 60 Highway alignment through the Gold Canyon Ranch area in Pinal County. The facility is currently under study by ADOT (US 60, Goldfield Road to Florence Junction Design Concept Study) and is referred to as the US 60 Bypass alignment. The general location is shown in Figure 7-3. According to the Design Concept Study, the facility would provide two lanes in each direction and be approximately seven miles long.

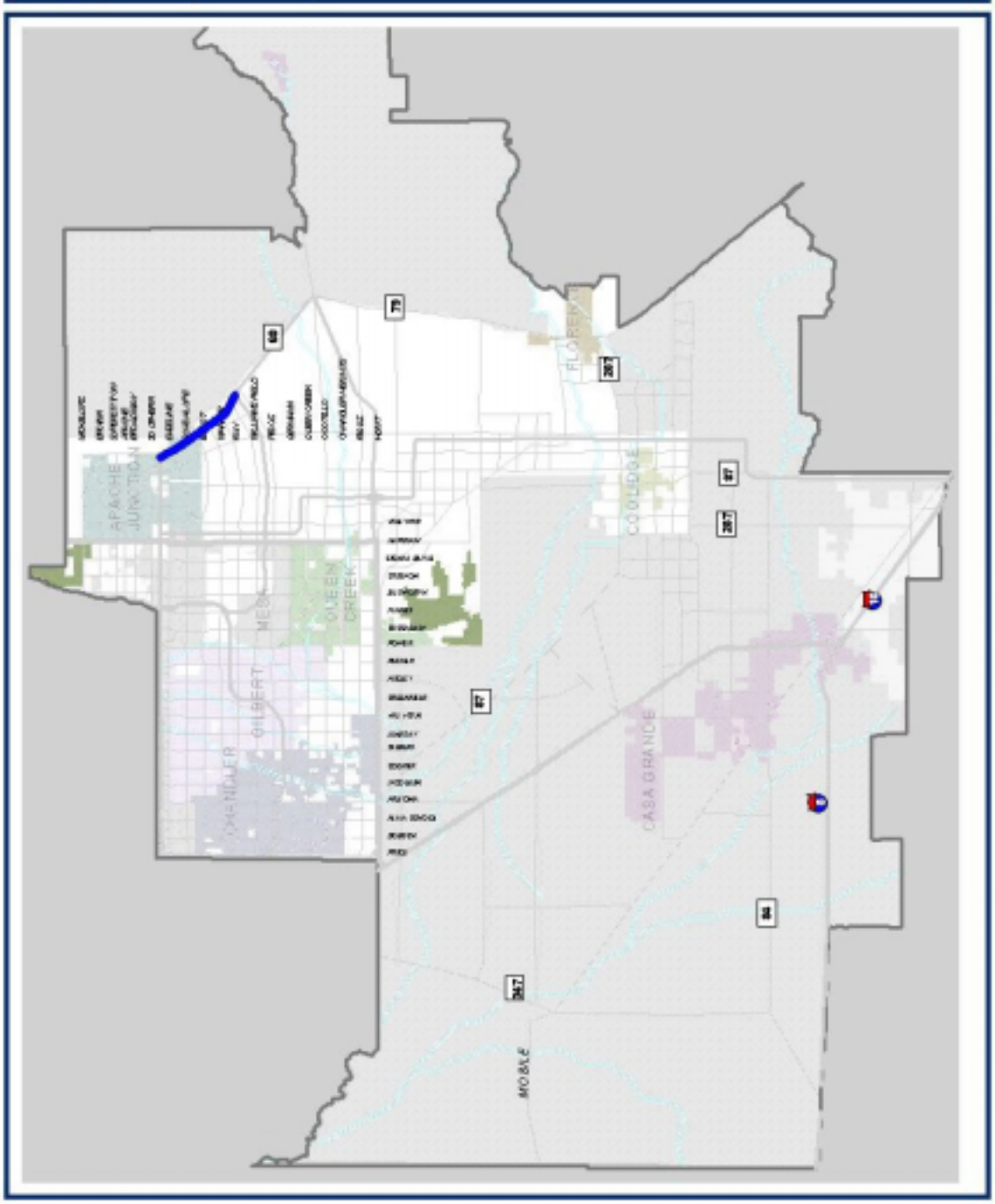
According to study documents, ADOT undertook the study to address the increasing congestion and safety concerns along US 60. The study also cites concerns about the rapid pace of development in the Gold Canyon area and associated access issues as a reason for the study.

The US 60 Freeway Extension would continue the freeway to the east on the south side of the existing US 60 Highway. The corridor identified in the study would be on new right of way. The right of way, which is estimated to be 351 acres, would be on State Land. Environmental impacts identified in the report include change in visual quality, Section 404 impacts, habitat fragmentation, and disturbance of suitable habitat for the pygmy-owl and the long-nosed bat.

According to the Design Concept Study, the facility would provide two lanes in each direction and be approximately seven miles long. The year 2025 daily traffic forecasts in the study range from 35,000 to 65,000 vehicles. The concept includes two interchanges, one east of Mountain View Road and one at Peralta Road. The study states that the estimated cost of the US 60 Bypass is $117 million.

S.E. Maricopa
N. Pinal County
Transportation
Study

Figure 7-3
US 60 Freeway
Extension Concept



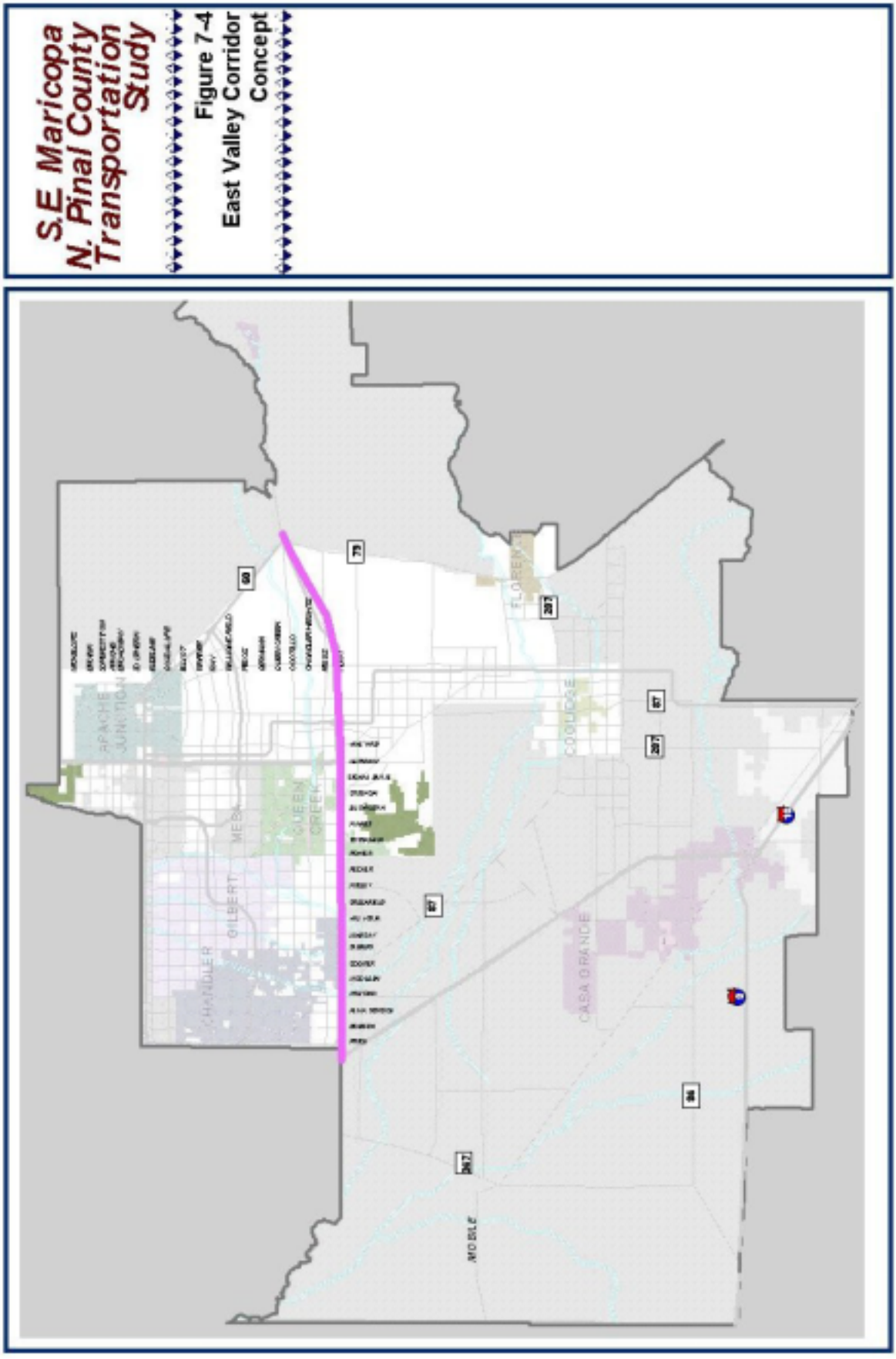
d. East Valley Corridor (I-10 to Florence Junction)

The East Valley Corridor is a corridor that would extend in an east-west direction through the middle of the study focus area. The Corridor parallels or overlaps Hunt Highway along the southern boundary of Maricopa County. The general location is shown in Figure 7-4. The facility would be approximately 31 miles long with 19 miles within Maricopa County and 12 miles within Pinal County.

The concept is to provide a high-level facility, which extends from I-10 eastward to US 60 near Florence Junction. There are two arterials that follow a portion of the corridor: Riggs Road and Hunt Highway. Both are arterial roadways that start at I-10 and extend to the east. If developed as an expressway/controlled access arterial, this facility could utilize portions of both the Riggs Road and Hunt Highway alignments. This corridor would provide an alternative for east-west travel.

The alignment on the west end of the corridor would have to consider existing land uses and minimize impacts to development. The land on the east end of the facility is currently vacant, however, San Tan Regional Park is located just south of the corridor near Ellsworth Road. Between Power Road and I-10, the corridor is located along the border between Maricopa County and the Gila River Indian Community. Depending on which side of the boundary the facility was located, it could be disruptive to existing development.

The East Valley Corridor would be a six-lane facility with interchanges at 1-2 mile spacing. According to MAG travel projections, the Corridor would carry 84,000 to 110,000 vehicles daily between I-10 and Higley Road, 63,000 to 84,000 vehicles daily between Higley Road and Ironwood, and 14,000 to 21,000 between Ironwood and US 60. It should be noted that revised population projections being prepared for the Northern Pinal County area covering the State Land property would likely result in higher traffic volume projections. The estimated cost of the overall facility is $1,390 million as a freeway and #310 million as an expressway/controlled access arterial.


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-4
East Valley Corridor
Concept
APACHE JUNCTION
QUEEN CREEK
CHANDLER
GILBERT
MESA
FLORENCE
COOLIDGE
CASA GRANDE
MIDDLE
60
79
287
87
347
10

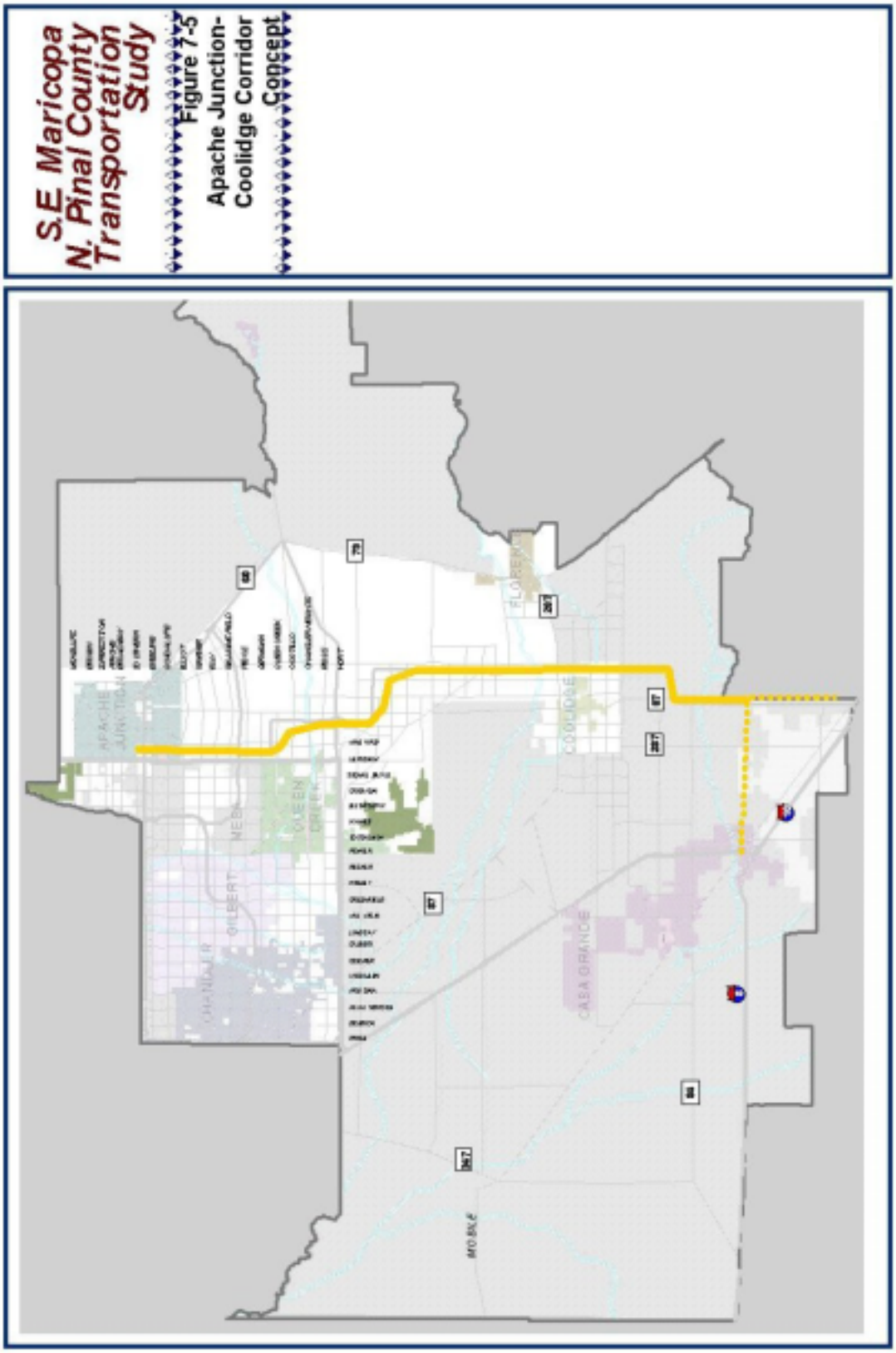
e. Apache Junction/Coolidge Corridor (US 60 to I-10)

The longest of the corridors under consideration, the Apache Junction/Coolidge Corridor, extends approximately 36 miles in the north-south direction on the east side of the study area. The Corridor generally follows SR 87 south of Coolidge and continues north to US 60. The general location is shown in Figure 7-5. The Apache Junction/Coolidge Freeway would be entirely within Pinal County. The alignment includes a crossing of the Gila River and a crossing of the UPRR mainline tracks.

The concept is to provide a freeway facility between US 60 in Apache Junction and I-10 in Casa Grande. Freeway traffic destined for the East Valley from Tucson currently uses I-10 and continues northwesterly to the US 60 interchange in Tempe. This corridor would reduce travel time for those travelers and relieve congestion on I-10. In addition, a freeway facility in this part of the Valley would serve regional trips and provide an alternative for truck traffic to and from industrial developments. Because of its length, this facility would most likely be built in phases rather than all at once. The design characteristics of the facility may change across its length as well. Portions of the facility would be near the communities of Apache Junction, Coolidge, and Florence. In these areas, the design will need to be compatible with the surrounding land uses.

The concept includes two alternatives for the southern terminus. One alternative follows the existing SR 87 alignment south to I-10 at Eloy. This routing follows the overall north-south direction of the facility. Another potential terminus would be at the interchange of I-10 and I-8. With this alternative, the corridor would turn and follow an east-west alignment toward Casa Grande. The east-west portion of the alignment would be an extension of the existing I-8 facility.

This facility is expected to carry daily traffic volumes in the range of 60,000 to 88,000 vehicles between US 60 and Empire Road, 55,000 to 110,000 vehicles between Empire Road and SR 287, and 26,000 to 45,000 between SR 287 and I-10 based on 2030 projections. As noted previously, revised population projections for northern Pinal County will likely increase projected traffic volumes. The estimated construction cost of the facility is $1,640 million.


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-5
Apache Junction-
Coolidge Corridor
Concept
APACHE JUNCTION
GILBERT
QUEEN CREEK
CHANDLER
FLORENCE
COOLIDGE
CASA GRANDE
MESA
79
60
287
87
387
347
10

f. Roadway Network Operations

The 2020 and 2030 traffic forecasts for the new corridor network are presented in Figures 7-6 and 7-7. A comparison of Figure 7-6 and 7-7 shows that volume increases occur throughout the study area, but particularly in Pinal County. The year 2020 and 2030 level of service for roadway segments within the focus area is shown in Figures 7-7 and 7-8. The level of service for intersections is shown in Figures 7-9 and 7-10 for the years 2020 and 2030 respectively. While the level of service is slightly worse in 2030 than 2020 for the new corridors network, the level of service for either 2020 or 2030 is slightly better compared to the future base network or the enhanced network.

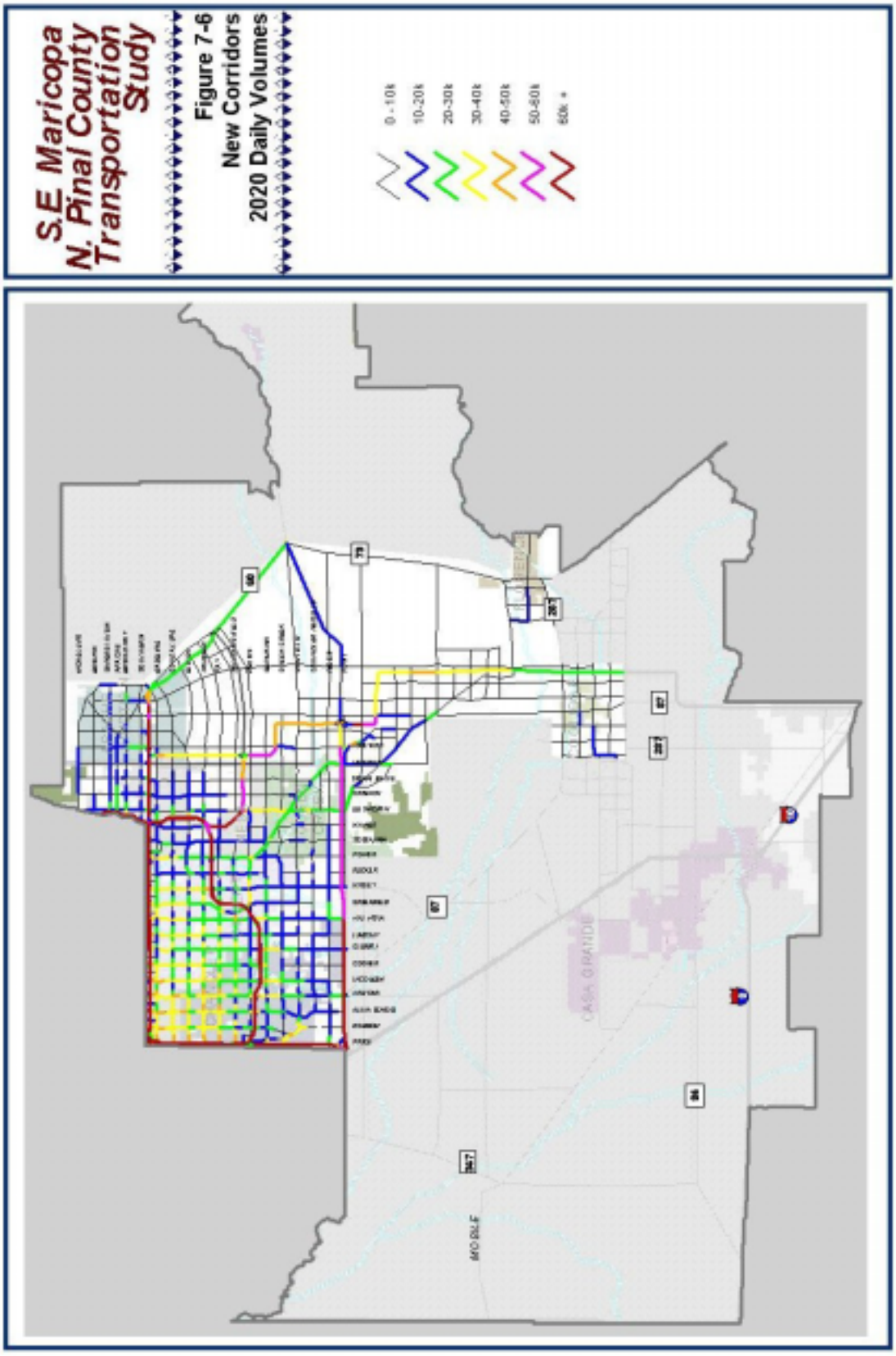
g. Roadway Network Summary

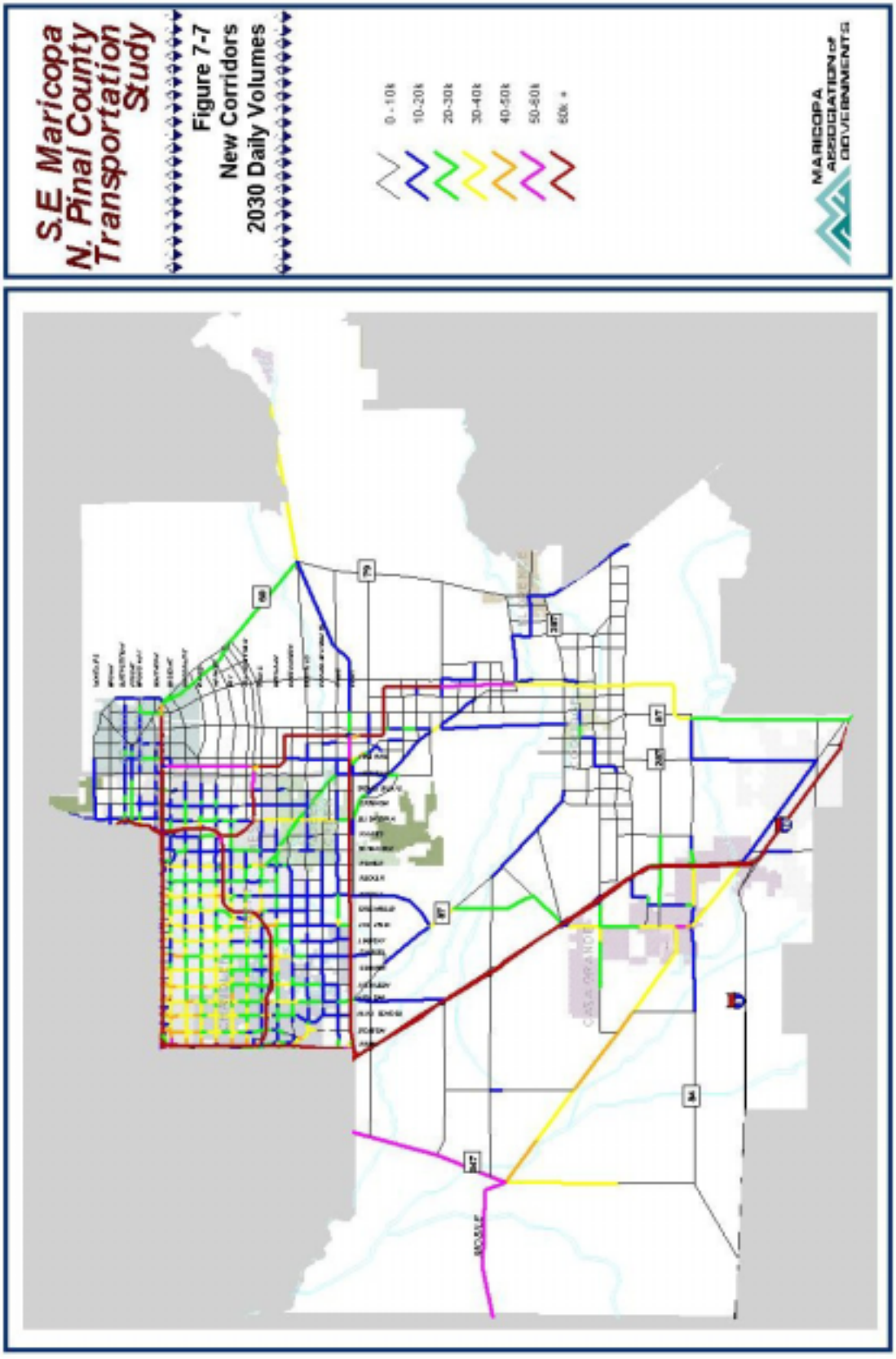
Table 7-1 presents a summary of the potential new freeway corridors and the cost.

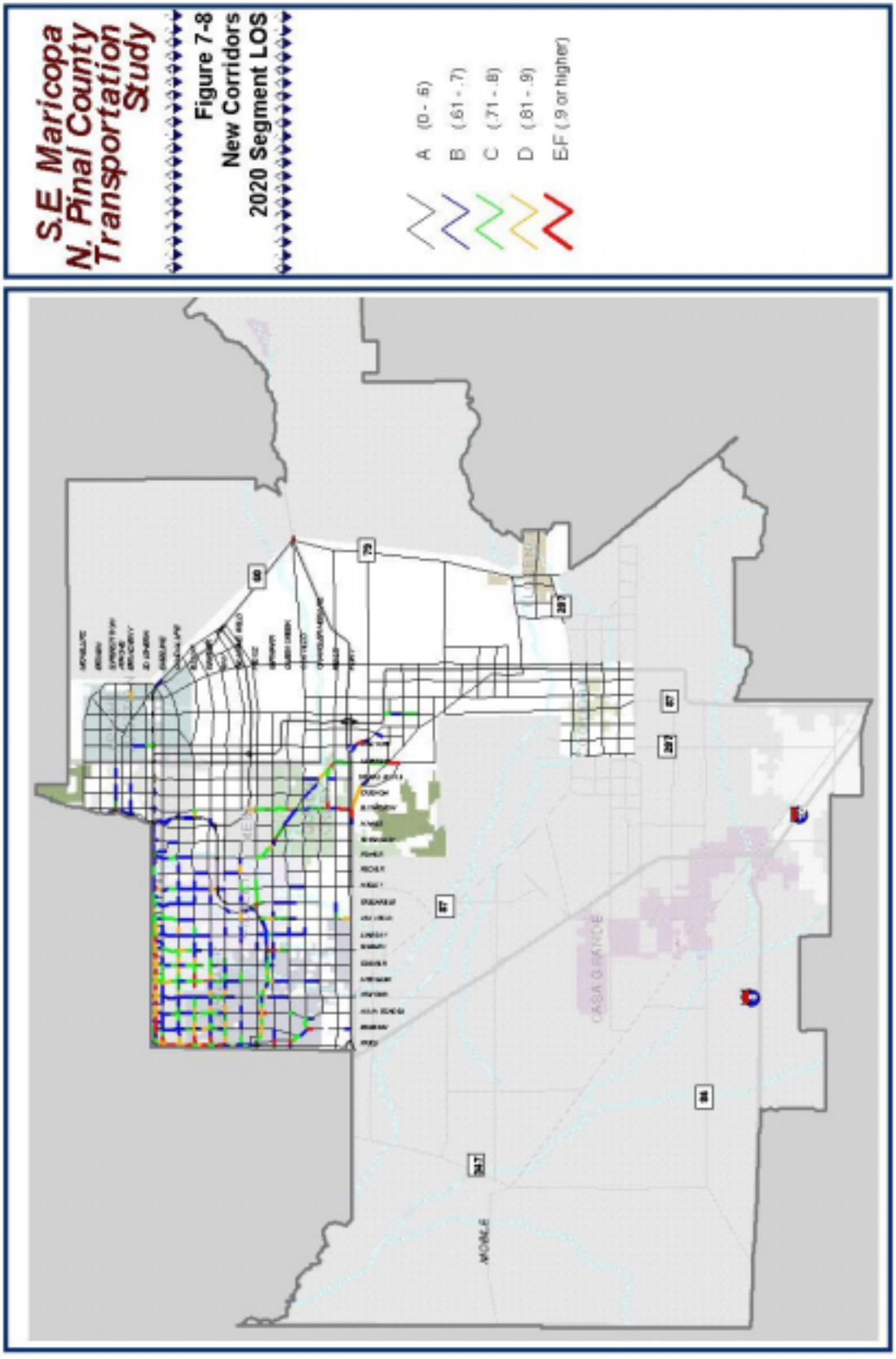
TABLE 7-1
NEW FREEWAYS SUMMARY

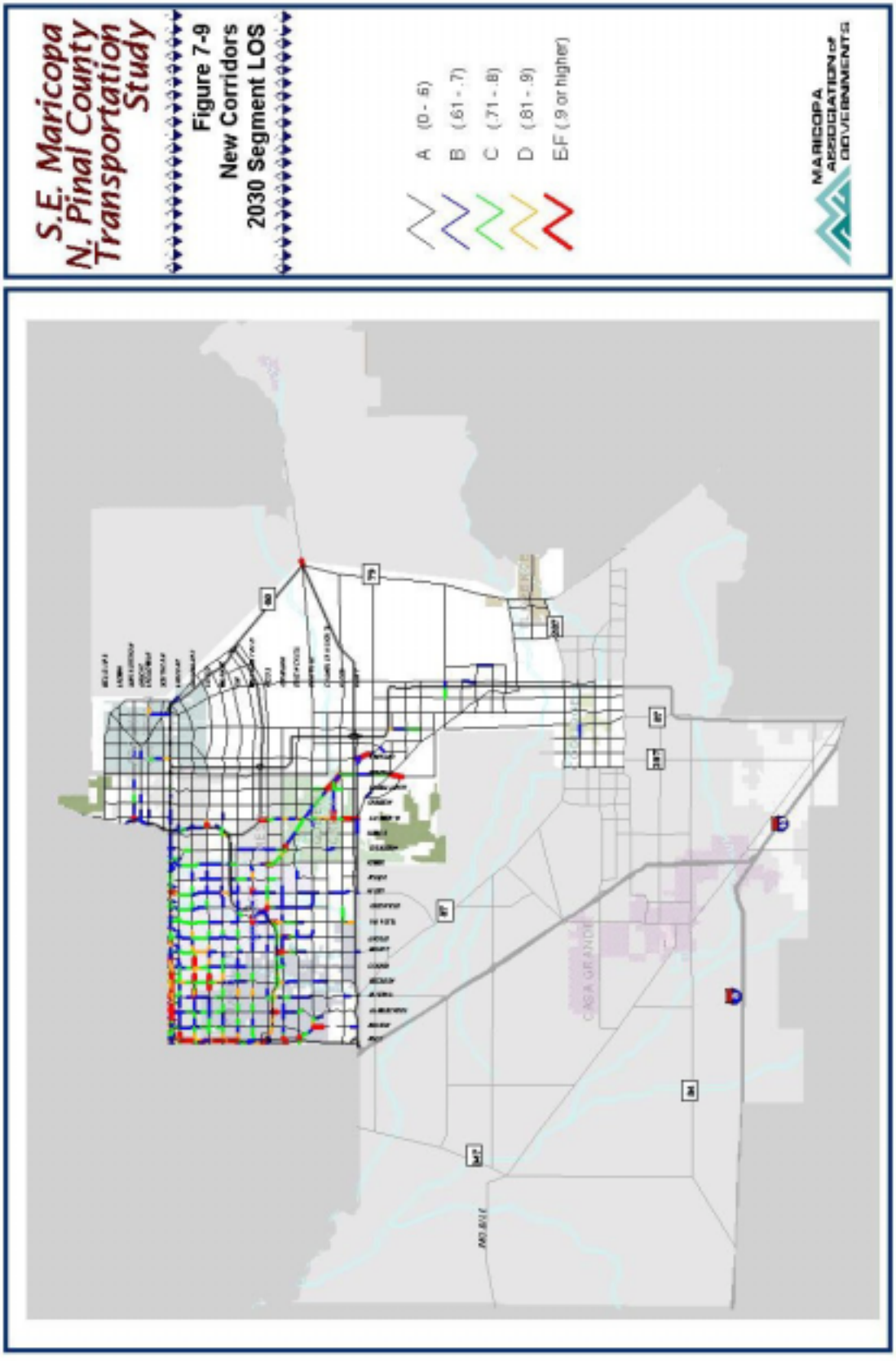
	CENTERLINE MILES	CONSTRUCTION COST (in millions)
Williams Gateway Freeway	15	$750
Price Freeway Connection	6	$390
US 60 Freeway Extension	7	$117
East Valley Corridor	31	$1,390
Apache Junction/Coolidge Corridor	36	$1,640
TOTAL	95	$4,287

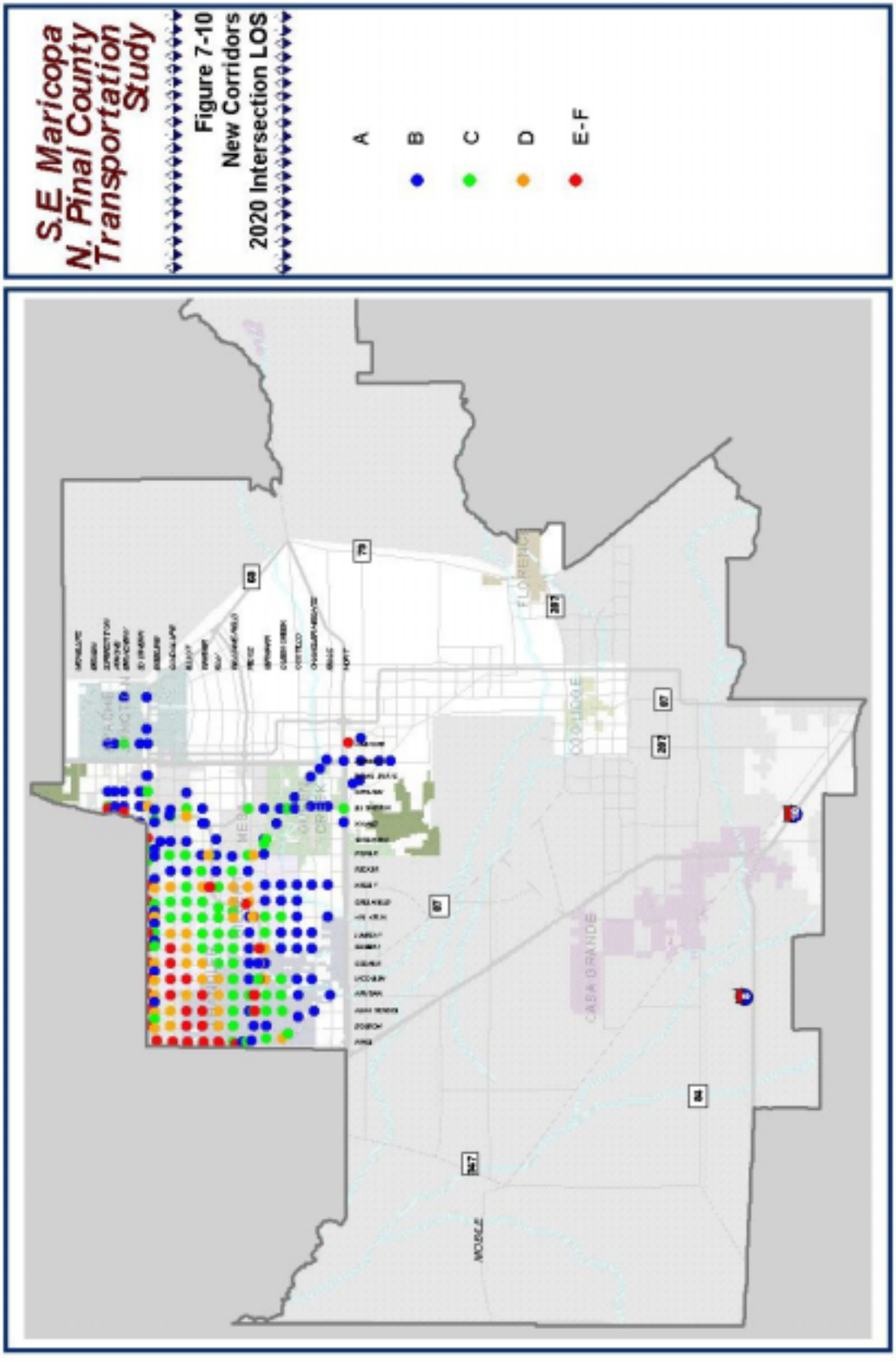
At the intersection of these freeways or their termination at an existing freeway, a system level interchange would be required. Within the focus area, six freeway-to-freeway interchanges are identified. The East Valley Corridor would have freeway-to-freeway interchanges at Price Freeway Connection and at the Apache Junction/ Coolidge Corridor. The Apache Junction/Coolidge Corridor would also have freeway-to-freeway interchanges at the Williams Gateway Freeway, at US 60, and at I-10. Williams Gateway Freeway would require a system interchange at the US 60 Freeway Extension. The cost of the system interchanges is included in freeway costs listed in Table 7-1.

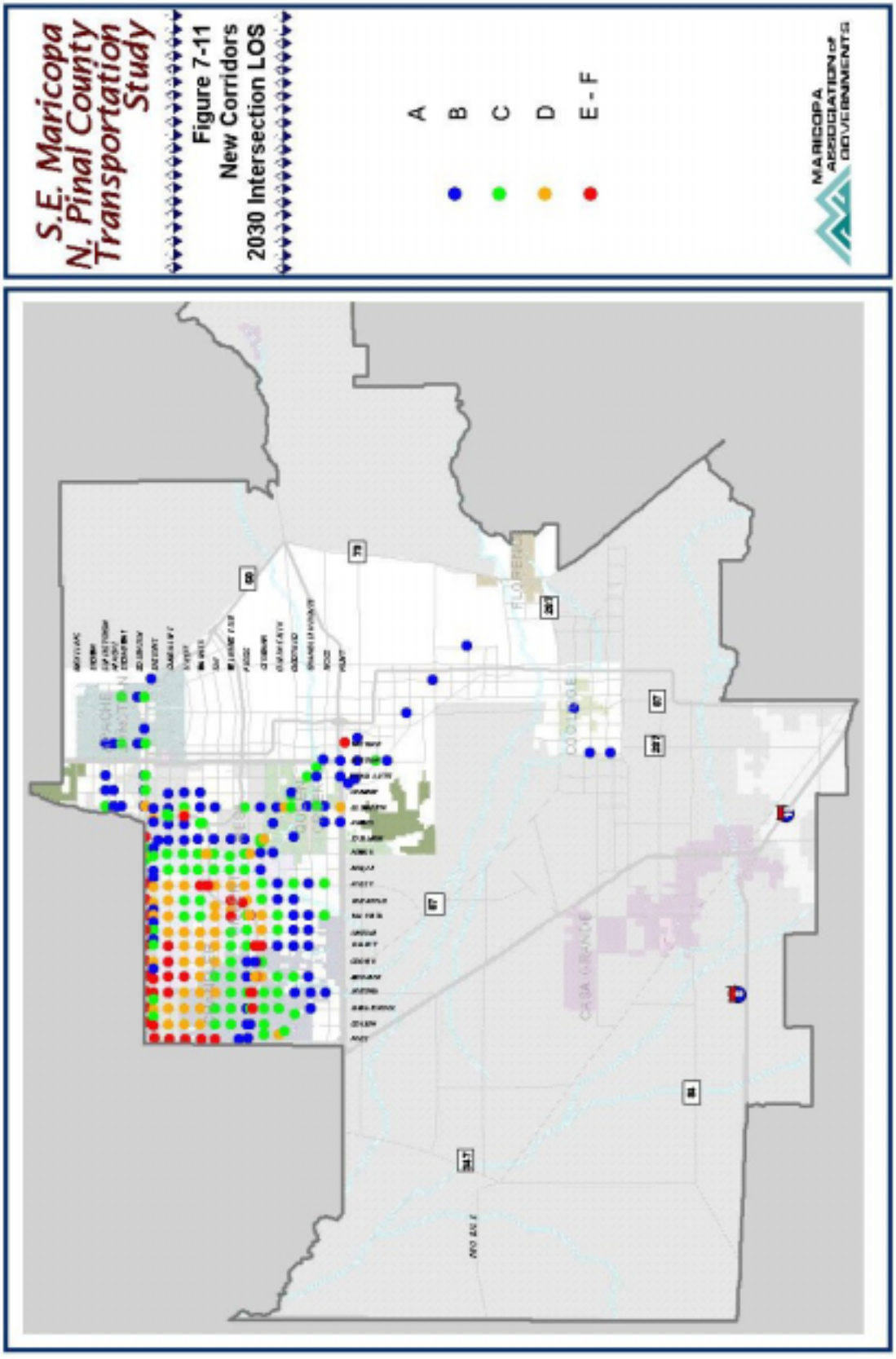

S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-6
New Corridors
2020 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
CASA GRANDE


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-7
New Corridors
2030 Daily Volumes
0 - 10k
10-20k
20-30k
30-40k
40-50k
50-60k
60k +
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-8
New Corridors
2020 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E,F (.9 or higher)
CASA GRANDE
MARICOPA


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 7-9
New Corridors
2030 Segment LOS
A (0 - .6)
B (.61 - .7)
C (.71 - .8)
D (.81 - .9)
E/F (.9 or higher)
MARICOPA
ASSOCIATION of
GOVERNMENTS


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-10
New Corridors
2020 Intersection LOS
A
B
C
D
E-F
FLORENCE
COOLIDGE
CASA GRANDE
MARICOPA


S.E. Maricopa
N. Pinal County
Transportation
Study
Figure 7-11
New Corridors
2030 Intersection LOS
A
B
C
D
E - F
MARICOPA
ASSOCIATION of
GOVERNMENTS

A summary of the 2020 and 2030 new corridors system statistics and performance for the study area-focus area are presented in Tables 7-2 and 7-3.

A further look at Tables 7-2 and 7-3 can provide some interesting statistics for use in comparing the different network packages. The average number of through lanes per mile on the arterial system is 5.2 in Maricopa County and 4.1 in Pinal County. The average number of lanes per mile on the freeway system is 7.3 in Maricopa County and 5.8 in Pinal County. The average daily volume on the arterial system in 2020 is expected to be 18,400 vehicles in Maricopa County and 4,700 in Pinal County. In 2030, the daily volume is expected to be 20,300 vehicles in Maricopa County and 6,100 in Pinal County. On the freeway system in 2020, the average daily volume is 116,900 in Maricopa County and 27,600 in Pinal County. In 2030, the average daily volume on the freeway system is 130,400 in Maricopa County and 40,500 in Pinal County.

TABLE 7-2
YEAR 2020 NEW CORRIDORS SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	539	482
Freeway & Expressway	94	81
Freeway-HOV	58	4
Total	691	567
LANE MILES		
Arterial	2779	1977
Freeway & Expressway	690	472
Freeway-HOV	116	8
Total	3585	2457
DAILY VMT		
Arterial	9,893,200	2,279,000
Freeway & Expressway	11,225,000	2,484,700
Freeway-HOV	525,700	2100
Total	21,643,900	4,765,800
INTERSECTION LOS		
D	44	0
E	35	0
F	25	1
Percent Congested	27	0
CONGESTED LANE MILES-PM Peak		
Arterial	26	6
Freeway & Expressway	34	0
Freeway-HOV	2	0
Percent Congested	2	0
HOURS OF DELAY-PM Peak		
Arterial	1897	104
Freeway & Expressway	4352	1
Freeway-HOV	137	0
Total	6,386	105
AVERAGE P.M. PEAK SPEED		
Arterial	31	37
Freeway	52	70
Freeway-HOV	58	63

TABLE 7-3
YEAR 2030 NEW CORRIDORS SUMMARY & PERFORMANCE

MEASURE	Maricopa County	Pinal County
CENTERLINE MILES		
Arterial	539	482
Freeway & Expressway	96	90
Freeway-HOV	58	4
Total	691	567
LANE MILES		
Arterial	2779	1977
Freeway & Expressway	690	472
Freeway-HOV	116	8
Total	3585	2457
DAILY VMT		
Arterial	10,931,800	2,918,100
Freeway & Expressway	12,522,300	3.647,800
Freeway-HOV	622,300	3700
Total	24,076,400	6,569,600
INTERSECTION LOS		
D	58	1
E	37	0
F	27	1
Percent Congested	32	0
CONGESTED LANE MILES-PM Peak		
Arterial	39	4
Freeway & Expressway	58	0
Freeway-HOV	8	0
Percent Congested	3	0
HOURS OF DELAY-PM Peak		
Arterial	2292	164
Freeway & Expressway	5220	2
Freeway-HOV	116	0
Total	7628	166
AVERAGE P.M. PEAK SPEED		
Arterial	30	36
Freeway	51	69
Freeway-HOV	58	63

h. Transit

The MAG High Capacity Transit study identifies a network of new transit services designed to meet the growing demand in the region. The overall objective of the recommended high capacity transit network is the creation of an integrated system of high capacity transit corridors providing efficient and convenient travel throughout the region. An important part of these corridors fulfilling their objective is to ensure that there are connections between the corridors and that these connections facilitate the movement of riders between systems no matter which transit technology is being operated.

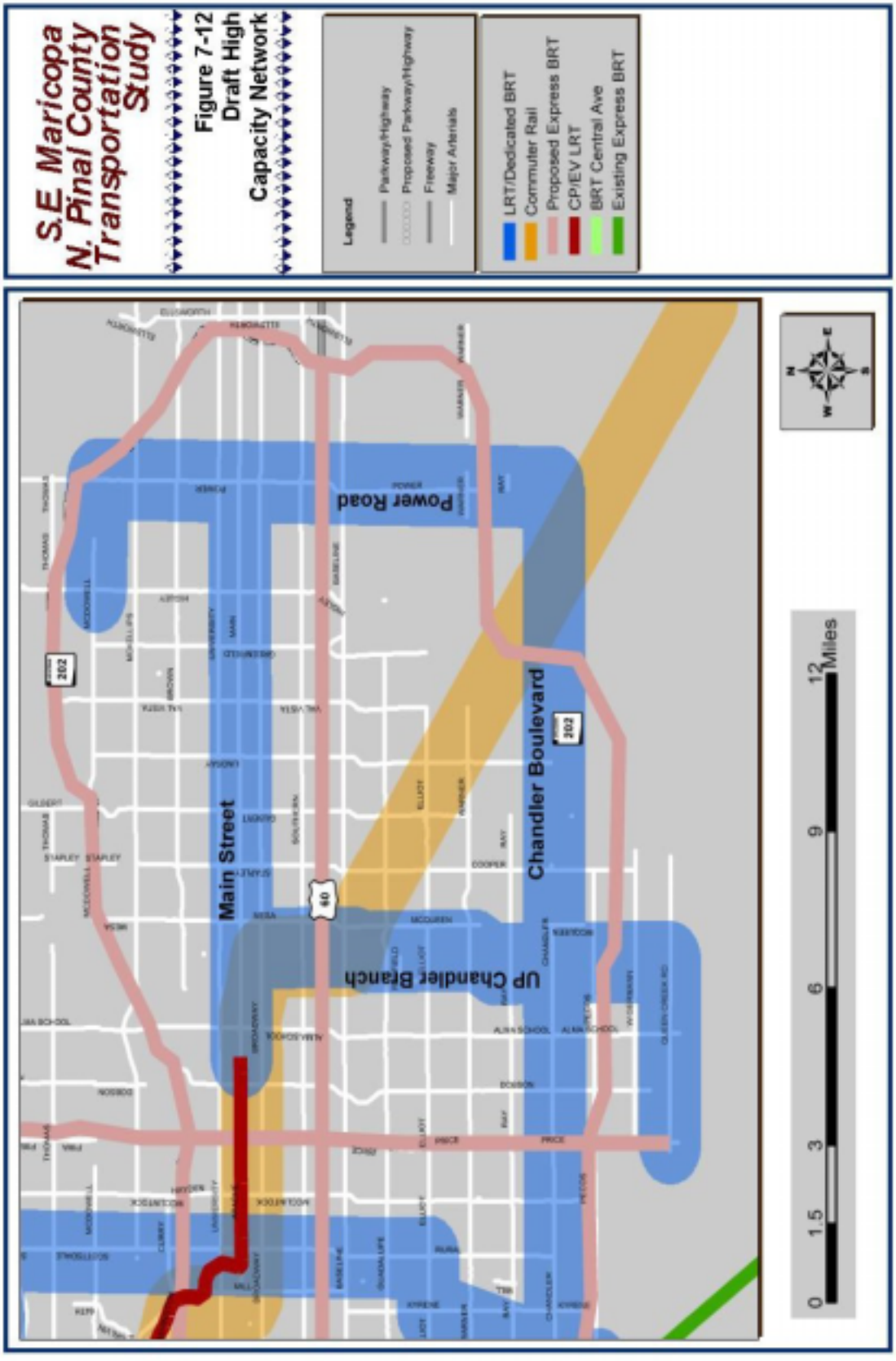
The High Capacity Transit Study is designed to be the first step in developing and prioritizing the recommended network of high capacity transit services in the region. This prioritization will continue at a more detailed level during the development of the MAG Regional Transportation Plan (RTP).

The high capacity corridors under consideration in the Southeast Maricopa/ Northern Pinal County area are shown in Figure 7-12. The potential cost of the high capacity corridors is summarized in Table 7-4. There is a range in cost because different technologies could ultimately be selected for the corridors.

TABLE 7-4
PRELIMINARY HIGH CAPACITY CORRIDOR COST

MPA	Operating Cost (mil)*	Capital Cost (mil)
UP Mainline Chandler	$70 to $104	$226 to $530
Chandler Boulevard	$38 to $97	$306 to $684
Main Street	$54 to $90	$185 to $374
Power Road	$33 to $83	$237 to $465
UP Southeast	$160	$567
TOTAL	$335-$534	$1,521-$2,620

*Assumes 50 percent of 2030 level for 20 years


S.E Maricopa
N. Pinal County
Transportation
Study
Figure 7-12
Draft High
Capacity Network
Legend
Parkway/Highway
Proposed Parkway/Highway
Freeway
Major Arterials
LRT/Dedicated BRT
Commuter Rail
Proposed Express BRT
CP/EV LRT
BRT Central Ave
Existing Express BRT
Power Road
Main Street
Chandler Boulevard
UP Chandler Branch
202
60
0
1.5
3
6
9
12
Miles

8.0 SUMMARY OF FINDINGS AND FUTURE SYSTEM DEVELOPMENT

This report has presented a discussion of three future network packages, and individual improvement projects contained in these packages, that address the projected growth in Southeastern Maricopa County and Northern Pinal County. This chapter will present a comparison of the three networks and related costs, as well as a discussion of priorities for improvement projects covering each of the transportation modes. Also, key consideration for future planning, coordination and implementation are identified.

The priorities described here are intended as a guide for MAG for this study area in the preparation of the Regional Transportation Plan, and as input to CAAG and its jurisdictions for their future efforts to address transportation needs and growth in Northern Pinal County.

a. Comparison of Transportation Networks

The MAG model was used to examine the 2000 existing condition and future conditions in the years 2020 and 2030. The study involved an assessment of three street and highway network packages: Future Base, Enhanced, and New Corridors.

Performance measures for existing conditions and each network package were documented in Chapters 3, 5, 6, and 7. Tables 8-1 through 8-4 present a comparison of these networks for Maricopa and Pinal counties for the years 2020 and 2030.

The following points highlight the significant performance measures in Table 8-1, which covers the Maricopa County portion of the study area-focus area for the Year 2020.

- The number of congested intersections is lowest with the 2020 New Corridors network.
- The number of congested lane miles is lowest with the New Corridors network.
- The hours of delay for arterials are lowest with the New Corridors and hours of delay are lowest for freeways with the Enhanced.
- The highest average freeway speed occurs with the 2020 New Corridors.

For the portion of Pinal County in the study area-focus area, the following points highlight the significant performance measures in Table 8-2, which also covers the Year 2020.

- The number of congested intersections is lowest with the 2020 New Corridors network.
- The number of congested lane miles is lowest with the New Corridors network.
- The hours of delay for arterials and freeways are lowest with the New Corridors.
- The highest average freeway speed occurs with the 2020 New Corridors.

The following points highlight the significant performance measures for southeastern Maricopa County as shown in Table 8-3, which covers the Year 2030.

- The number of congested intersections is lowest with the 2030 New Corridors network.
- The number of congested lane miles is lowest with the New Corridors network.
- The hours of delay for arterials are lowest with the New Corridors and hours of delay are lowest for freeways with the Enhanced.

For the portion of Pinal County in the study area-focus area, the following points highlight the significant performance measures in Table 8-4, which also covers the Year 2030.

- The number of congested intersections is lowest with the 2030 New Corridors network.
- The number of congested lane miles is lowest with the New Corridors network.
- The hours of delay for arterials and freeways are lowest with the New Corridors.

A more detailed discussion of each of the performance measures is provided below.

Network Lane Miles

The same networks were analyzed for both 2020 and 2030. In the Maricopa County portion of the study area, the future base network added significantly to the roadway capacity compared to the 2000 system. Total lane miles increased by 94%, with arterial lane miles increasing by 90% and freeway lane miles increasing by 124%. Compared to the future base, the enhanced network had a 6% increase in total lane miles, with a significant increase of 42% in freeway/expressway lane miles. Compared to the enhanced system, the new corridors network increased total lane miles by 8%, with freeway/expressway lane miles growing by 51%.

In the Pinal County portion of the study area, the capacity of the future base network was much greater than that of the 2000 network with total lane miles increasing by a factor of 4.7. Compared to the future base, the enhanced system added 1% to total lane mile capacity with a 35% increase in the freeway/expressway category. In the

new corridors network, relative to the enhanced system total lane miles increased by 37%, with freeway/expressway lane miles growing by a factor of 8.7.

Daily Vehicle Miles of Travel (VMT)

For the Maricopa County portion of the study area, total VMT increases in the range of 105-125% compared to the year 2000. The VMT increase from 2020 to 2030 is in the range of 2-10 percent for the three different networks. This reflects the forecasted population growth patterns, which indicate only a 6% increase in population between 2020 and 2030. In 2030, the new corridors package has a somewhat higher total VMT (6%) than the other options.

For Pinal County portion, total VMT in the future base increases by a factor of 2.8 for 2020 compared to 2000 and by a factor of 4.0 for 2030. This reflects the continuing growth in northern Pinal County after 2020. The VMT levels in the other networks again follow a similar pattern. However, in both 2020 and 2030 the enhanced and new corridors package have lower VMT than the future base, likely due to the better connectivity provided by these networks.

Intersection Level of Service (LOS)

In the Maricopa County part of the study area, congested intersections increases from 26% in 2000 to 36% in 2020 and 45% in 2030 for the future base network. This reflects the greater growth in VMT (129%) than lane miles (93%) between 2000 and 2030. With the additional capacity provided in the enhanced network, the percent congested intersections declines to 31% and 38% for 2020 and 2030, respectively. The further capacity additions in the new corridors package results in further reductions in percent congested intersections to 27% and 32% for 2020 and 2030.

For the Pinal County area, intersection congestion is minor with no package over 5% congested intersections in any of the target years. In 2030, the new corridor package virtually eliminates any congested intersections.

Congested Lane Miles (PM Peak) and Delay

In Maricopa County for the future base network, total miles of congested facilities increases by 1% between 2000 and 2020 and 27% between 2000 and 2030. The small increase between 2000 and 2020 is due, in part, to the significant increase in arterial lane-miles included in this network. The percent congested declines from 9% in 2000 to 5% and 6% in 2020 and 2030, respectively, due to the fact that

considerable new arterial mileage is added in uncongested areas. However, the hours of delay on these congested facilities increases very significantly between 2000 and the future. For the future base, total hours of delay increases by 39% for 2020 compared to 2000 and 86% for 2030.

The addition of the new capacity in the enhanced network significantly reduces this delay compared to the future base network. As a result, the enhanced system has 28% less delay than the future base in 2020 and 31% less in 2030. The new corridors network provides further reductions in delay, having 2% less delay in 2020 and 9% less in 2030 compared to the enhanced network.

For the Pinal County area, for the future base network, congested lane miles and delay increase by a significant amount compared to the 2000 figures. This is in keeping with the major growth in VMT. Compared to 2000 congested lane miles increases by a factor of 12.2 and total delay by a factor of 13.0 for 2030. However, this level of delay (220 hours per million VMT) is only about half that experienced in the Maricopa County part of the study area, which is 530 hours per million VMT.

As was the case in Maricopa County, the enhanced and new corridors networks reduce the amount of delay significantly in the Pinal County area. Compared to the future base, the enhanced system reduces total delay by 22% in 2020 and 42% in 2030. Further reductions in delay are provided by the new corridors system, with total delay declining by a factor of 4.6 in 2020 and 5.8 in 2030, compared to the enhanced system. It should be noted that the traffic modeling process may be diverting larger volumes of traffic to high level facilities than may actually be experienced in actual practice.

Average p.m. Peak Speed

In the Maricopa County area, speeds on arterials decline from 31 mph in 2000 to 30 mph in 2020 and 28 mph in 2030 in the future base. The arterial speeds are 1 to 2 mph greater in the enhanced and new corridor networks. For freeways, speeds are significantly greater for the enhanced and new corridors networks. In 2020, the average speed on freeways is 49 mph in the enhanced system and 52 mph in the new corridor network compared to the future base speed of 44 mph in 2020. For the enhanced and new corridors in 2030, speeds are 47 mph and 51 mph compared to 40 mph for the future base.

In the Pinal County area, speeds on arterials and freeways are 35 mph and 63 mph, respectively in 2000. These figures fall to 35 mph and 58 mph for the future base network in 2020 and 33 mph and 55 mph in 2030. For the enhanced system and the new corridors network, speeds are 1 to 2 mph greater than the future base on arterials and 5 to 14 mph greater on freeways.

TABLE 8-1
MARICOPA COUNTY-2020 NETWORK COMPARISON

MEASURE	2000	Future Base	Enhanced	New Corridors
CENTERLINE MILES				
Arterial	455	554	554	539
Freeway & Expressway	36	63	63	94
Freeway-HOV	0	16	58	58
Total	491	633	675	691
LANE MILES				
Arterial	1491	2827	2827	2779
Freeway & Expressway	195	402	504	690
Freeway-HOV	0	34	116	116
Total	1686	3263	3447	3585
DAILY VMT				
Arterial	6,098,100	12,236,200	11,318,300	9,893,200
Freeway & Expressway	3,878,600	9,828,200	8,631,900	11,225,000
Freeway-HOV	0	420,500	564,500	525,700
Total	9,976,700	22,484,900	20,514,700	21,643,900
INTERSECTION LOS				
D	37	66	53	44
E	33	51	41	35
F	10	24	28	25
Percent Congested	26	36	31	27
CONGESTED LANE MILES-PM Peak				
Arterial	114	80	51	26
Freeway & Expressway	37	63	37	34
Freeway-HOV	0	9	5	2
Percent Congested	9	5	3	2
HOURS OF DELAY-PM Peak				
Arterial	3515	3482	2536	1897
Freeway & Expressway	2992	5349	3903	4352
Freeway-HOV	0	221	80	137
Total	6507	9052	6519	6386
AVERAGE PM PEAK SPEED				
Arterial	31	30	30	31
Freeway	42	44	49	52
Freeway-HOV	NA	52	58	58

TABLE 8-2
PINAL COUNTY-2020 NETWORK COMPARISON

MEASURE	2000	Future Base	Enhanced	New Corridors
CENTERLINE MILES				
Arterial	159	482	482	482
Freeway & Expressway	17	17	17	81
Freeway-HOV	0	0	4	4
Total	176	499	503	567
LANE MILES				
Arterial	368	1962	1962	1977
Freeway & Expressway	68	68	88	472
Freeway-HOV	0	0	8	8
Total	434	2030	2058	2457
DAILY VMT				
Arterial	1,309,800	4,637,000	3,884,400	2,279,000
Freeway & Expressway	592,200	707,500	757,500	2,484,700
Freeway-HOV	0	160	5400	2100
Total	1,902,000	5,344,660	4,647,300	4,765,800
INTERSECTION LOS				
D	0	3	3	0
E	0	0	0	0
F	0	1	1	1
Percent Congested	0	2	2	0
CONGESTED LANE MILES-PM Peak				
Arterial	5	17	12	6
Freeway & Expressway	0	1	1	0
Freeway-HOV	0	0	0	0
Percent Congested	1	1	1	0
HOURS OF DELAY-PM Peak				
Arterial	109	566	442	104
Freeway & Expressway	19	51	41	1
Freeway-HOV	0	0	0	0
Total	128	617	483	105
AVERAGE P.M. PEAK SPEED				
Arterial	35	35	36	37
Freeway	63	58	63	70
Freeway-HOV	NA	63	63	63

TABLE 8-3
MARICOPA COUNTY-2030 NETWORK COMPARISON

MEASURE	2000	Future Base	Enhanced	New Corridors
CENTERLINE MILES				
Arterial	455	554	554	539
Freeway & Expressway	36	63	63	94
Freeway-HOV	0	16	58	58
Total	491	633	675	691
LANE MILES				
Arterial	1491	2827	2827	2779
Freeway & Expressway	195	402	504	690
Freeway-HOV	0	34	116	116
Total	1686	3263	3447	3585
DAILY VMT				
Arterial	6,098,100	14,102,400	12,766,100	10,931,800
Freeway & Expressway	3,878,600	8,269,200	9,282,000	12,522,300
Freeway-HOV	0	480,200	671,600	622,300
Total	9,976,700	22,851,800	22,719,700	24,076,400
INTERSECTION LOS				
D	37	98	83	58
E	33	56	40	37
F	10	24	29	27
Percent Congested	26	45	38	32
CONGESTED LANE MILES-PM Peak				
Arterial	114	103	66	39
Freeway & Expressway	37	78	51	58
Freeway-HOV	0	11	6	8
Percent Congested	9	6	4	3
HOURS OF DELAY-PM Peak				
Arterial	3515	4842	3378	2292
Freeway & Expressway	2992	6916	4802	5220
Freeway-HOV	0	325	125	116
Total	6507	12,083	8305	7628
AVERAGE PM PEAK SPEED				
Arterial	31	28	29	30
Freeway	42	40	47	51
Freeway-HOV	NA	50	57	58

TABLE 8-4
PINAL COUNTY-2030 NETWORK COMPARISON

MEASURE	2000	Future Base	Enhanced	New Corridors
CENTERLINE MILES				
Arterial	159	482	482	482
Freeway & Expressway	17	17	17	81
Freeway-HOV	0	0	4	4
Total	176	499	503	567
LANE MILES				
Arterial	368	1962	1962	1977
Freeway & Expressway	68	68	88	472
Freeway-HOV	0	0	8	8
Total	434	2030	2058	2457
DAILY VMT				
Arterial	1,309,800	6,824,200	5,756,600	2,918,100
Freeway & Expressway	592,200	763,900	851,100	3.647,800
Freeway-HOV	0	300	7800	3700
Total	1,902,000	7,588,400	6,615,500	6,569,600
INTERSECTION LOS				
D	0	8	6	1
E	0	1	2	0
F	0	1	1	1
Percent Congested	0	5	4	0
CONGESTED LANE MILES-PM Peak				
Arterial	5	61	28	4
Freeway & Expressway	0	1	1	0
Freeway-HOV	0	0	0	0
Percent Congested	1	3	1	0
HOURS OF DELAY-PM Peak				
Arterial	109	1536	871	164
Freeway & Expressway	19	132	97	2
Freeway-HOV	0	0	0	0
Total	128	1668	968	166
AVERAGE P.M. PEAK SPEED				
Arterial	35	33	35	36
Freeway	63	55	62	69
Freeway-HOV	NA	63	63	63

b. Future Development of the Transportation System

This section presents an approach for the development of the transportation system in the study area. This was done by identifying three groups of actions/projects that represent key components in the future development of the system. The order of these groups is intended to convey the relative degree of emphasis that should be placed on their implementation, with Group I having the highest emphasis. The order of projects within the groups is not significant.

The groupings were based on public and agency input received at workshops and forums, as well as data and information compiled throughout the study process. This includes factors such as community issues and concerns, facility utilization and system continuity and connectivity.

It should be noted that the timing of individual project implementation steps might vary. For example, actions such as right-of-way protection may need to occur early, even though a project may not have a high overall priority. Table 12 provides a summary of project costs by group.

Group I

Group I includes the projects and programs listed below. A further description of these elements follows the initial listing.

- MAG/CAAG/State lands coordination
- Future Transportation Funding
- Arterial improvements
- Local bus expansion
- Freeway and highway widening
- William Gateway Freeway
- Superstition Freeway Extension (US 60 Bypass)

MAG/CAAG/State Lands Coordination

The primary purpose of the Southeast Maricopa/Northern Pinal County Area Transportation Study (SEMNPTS) has been to initiate closer coordination of transportation planning and implementation functions in the two-county area. Along with the jurisdictions in MAG and CAAG, another key actor in this area is the State Land Department, which has major land holdings. The manner in which these

holdings are developed will have a major influence on the nature and magnitude of future transportation needs in the area. Of particular importance is the need to preserve right-of-way for key future transportation corridors.

The cooperative effort established among the agencies as part of the SEMNPTS process needs to continue to ensure that effective planning for future growth occurs.

Some of the specific steps in this regard include:

- Integration of MAG and CAAG transportation plans into State Land development plans.
- Continued joint transportation planning studies by MAG and CAAG for the SEMNPTS study area.
- Continued joint population and travel forecasting efforts by MAG and CAAG for the SEMNPTS study area.

Future Transportation Funding

As noted in the study, significant improvements and expansion of all modes of transportation will be needed. A particular concern in this regard is funding required for development and upgrades of the arterial grid network. This system serves not only traffic within the study area but also plays a vital regional role. Funding for the arterial grid from regional, as well as local and developer, sources should be pursued. A parallel concern is present for the bus grid. This system plays a dual role similar to the arterial network and is appropriate for regional funding participation.

The study has also clearly identified the close transportation ties that exist between southeast Maricopa and northern Pinal County. Funding for meeting the common transportation needs of this area should be approached through joint efforts by MAG, CAAG and ADOT, seeking funding for critical transportation projects within both southeast Maricopa and northern Pinal County.

Arterial Improvements

This is the arterial street widening presented in Figure 4. The arterial grid is the backbone of the transportation system and the investment needs to be protected. The arterial street widening results in a consistent cross section and provides a logical number of lanes.

Local Bus Expansion

There is still relatively little transit service in the Southeast Maricopa/Northern Pinal County area. Fixed route service currently exists on some of the arterial streets in the northwest portion of the study area.

For the most part, there is limited service in Northern Pinal county, with the exception of Coolidge and some scattered vanpool service. The communities of Casa Grande, Florence, and Apache Junction do not have organized city-sponsored transit services.

Like the arterial street system, the fixed route transit system would be expanded to serve growth in existing service areas as well as new development. Service improvements and additions would coincide with the arterial street system improvements and residential and commercial development.

Freeway and Highway Widening

This includes the freeway, highway and interchange improvements presented in Figures 6 and 7. These widenings result in significant reductions in travel delay and congested intersections.

Enhancements to existing freeway facilities are considered to be a high priority. Significant investments have already been made in these facilities and it is important to maintain their operational integrity.

The enhancements to the freeway facilities described in this study include the provision of HOV lanes and general-purpose lanes. The HOV lanes encourage carpooling and have the added advantage of providing infrastructure for express bus service.

Other components of this package are new interchanges and improvements to existing interchanges and widening of state highway. These improvements are needed to maintain accessibility to the freeway system and continue to serve the increasing demand. This should also include allowances to ensure that funding is available for future interchange enhancements not yet specified but that will inevitably be needed as the SEMNPTS area develops more fully.

Williams Gateway Freeway

This is one of the new corridors. The Williams Gateway Freeway would serve the Williams Gateway Airport and ancillary developments, the General Motors site (scheduled for re-development), and potential developments on State Land in Pinal County. The majority of the land in the corridor is currently vacant. The freeway would serve as a link between the emerging development area at the county boundaries and the rest of the regional freeway network. This freeway is included in the Mesa Transportation Plan as a facility that provides regional access to the planned employment hub in this part of this City. The Williams Gateway Freeway is expected to reduce traffic volumes on adjacent arterial streets including Ray Road, Williams Field Road, and Germann Road.

Superstition Freeway Extension

This is one of the new corridors. The US 60 Freeway Extension would continue the existing freeway portion of US 60 southeasterly towards Florence Junction. The freeway would provide access to additional land area in Pinal County and enhance the opportunity for arterial street extensions into Pinal County. It would provide a critical bypass for U. S. 60 in the developing areas of Northern Pinal County and be a key link in the freeway system structure as the State Lands develop.

Group II

Group II includes the projects and programs listed below. A further description of those elements follows the initial listing.

- East Valley Corridor
- Price Freeway Connection
- BRT/Express Bus Expansion
- Rural Bus Service
- Apache Junction/Coolidge Corridor
- Non-motorized System

East Valley Corridor

This is one of the new corridors. The East Valley Corridor extends from I-10 eastward to US 60 near Florence Junction. This corridor would provide an alternative to US 60 for regional east-west travel. There is existing development along the west end of the corridor, which could be impacted. The land on the east end of the facility is currently vacant. Between Power Road and I-10, the corridor is located along the border

between Maricopa County and the Gila River Indian Community. The Santan Mountain Regional Park would have to be avoided near the mid-point of the route.

Price Freeway Connection

This is one of the new corridors. The Price Freeway Connection provides a direct north-south connection from areas to the south of Loop 202. This connection would improve access to Memorial Airfield on the Gila River Indian Community and provide alternative access to the freeway system for the East Valley. There do exist residential and industrial developments along the corridor that would be subject to disruption by a new facility.

Express Bus Expansion

Enhancements to the regional transit system would also be an important element of the transportation network in the study area. The freeway widening which includes HOV lanes provides the opportunity for additional express bus service. Additional features including park and ride lots, transit centers, and express service along selected arterial streets are all a high priority for the transit system.

Rural Bus Service

In the study area, Greyhound operates intercity bus routes on US 60 that connect Apache Junction with Phoenix and with Globe. Other cities served along the eastern route are Superior and Florence Junction. Gilbert and Mesa lie on the western route. Apache Junction has a Greyhound Ticket Center. Other intercity Greyhound routes connect Chandler with Phoenix and with Tucson. Maintaining and increasing intercity service will be important in the future, especially to provide alternatives for access between communities in Pinal County.

Apache Junction/Coolidge Corridor

This is one of the new corridors. The Apache Junction/Coolidge Corridor extends in a north-south direction on the east side of the study area completely within Pinal County. The concept is to provide a freeway facility between US 60 in Apache Junction and I-10 in Casa Grande to provide more direct north-south regional access. A new facility would reduce travel time between the East Valley and Tucson or I-8. This facility would reduce demand on I-10 between Casa Grande and US 60 and provide an alternative for truck traffic to and from industrial developments in Pinal County and the East Valley. Much of the land along the corridor is vacant except in those areas adjacent to the cities of Florence and Coolidge.

Non-motorized System

This element would address issues and conditions on the non-motorized system discussed previously in this document. Non-motorized projects include on-street facilities, off-street facilities, other corridors, and connections to other modes. On-street facilities should be built as the street is built to save construction costs and minimize disruption to adjacent properties. On-street facilities are addressed as part of the arterial improvements in Group I. Crossing of barriers is also a high priority for non-motorized travel.

Group III

Group III includes the projects and programs listed below. A further description of these elements follows the initial listing.

- High Capacity Transit
- New Arterial Links

High Capacity Transit

The High Capacity Corridor Study (MAG, 2003) evaluated a number of potential BRT/LRT and commuter rail corridors. A number of these corridor fall within the study area and have the long-range potential to provide key regional transit access to activity centers as they develop.

New Arterial Links

The arterial network will include construction of new arterials to accommodate expected future growth. The construction of new arterials is expected to be development driven. Most agencies in the study area require developers to provide right of way and some portion of the arterial street along their frontage as part of the development approval process.

TABLE 8-5
FOCUS AREA IMPROVEMENT SUMMARY (2002 cost in millions)

Improvement	Description	Maricopa Area Cost (millions-2002 $)	Pinal Area Cost (millions-2002 $)	Total Cost millions-2002 $)
GROUP I				
Arterial Improvements	Various widening 2-4, 2-6, and 4-6	$1,213	$402	$1,65
Intersection Improvements	Various locations	$90	$0	$90
US 60: *Gilbert to Val Vista*	Widen to five general purpose + one HOV lane	$16	$0	$16
US 60: *Val Vista to Loop 202*	Widen to five general purpose + one HOV lane	$132	$0	$132
US 60: *Loop 202 to Signal Butte*	Widen to four general purpose + one HOV lane	$42	$0	$42
US 60: *Signal Butte to Goldfield*	Widen to three general purpose + one HOV lane	$28	$42	$70
Loop 202: *(Loop 101 to University Dr)*	Widen to four general purpose + one HOV lane	$308	$0	$308
Loop 101: *US 60 to Loop 202 (south)*	Widen to four general purpose + one HOV lane	$98	$0	$98
Freeway-New/Improved Interchanges	US 60 at Lindsay (new) US 60 at Meridian (new) US 60 at Greenfield US 60 at Higley US 60 at Power US 60 at Ellsworth US 60 at Crismon US 60 at Signal Butte Various locations-Loop 101 & Loop 202	$13 $0 $3 $3 $3 $3 $3 $3 $18	$0 $7 $0 $0 $0 $0 $0 $0 $0	$13 $7 $3 $3 $3 $3 $3 $3 $18
US 60 (Ray Road to Florence Jct.)	Widen to three lanes in each direction Develop access controlled corridor Add five traffic interchanges	$0 $0	$28 $60	$28 $60
SR 79 (Florence Jct. To Focus Area Boundary)	Widen to two lanes in each direction	$0	$60	$60
SR 287 (SR 87 to SR 79)	Widen to two lanes in each direction	$0	$36	$36
SR 87 (SR 387 to SR 287)	Widen to two lanes in each direction	$0	$28	$28

TABLE 8-5 (CONTINUED)
FOCUS AREA IMPROVEMENT SUMMARY (2002 cost in millions)

Improvement	Description	Maricopa Area Cost (millions-2002 $)	Pinal Area Cost (millions-2002 $)	Total Cost millions-2002 $)
GROUP I (continued)				
Canal Bridges	Various locations	$8	$2	$10
River Crossing	Various locations	$0	$6	$6
Railroad Crossing	Various locations	$2	$6	$8
Highway Interchanges	SR 87 & Main Street (Florence) SR 87 & SR 287 SR 87 & SR 587	$0 $0 $0	$10 $10 $10	$10 $10 $10
New HOV Interchange Ramps	US60/202 & 101/202	$70	$0	$70
Freeway Operational Improvements	All freeway miles	$94	$81	$175
Williams Gateway Freeway[1]	New six-lane freeway	$300	$450	$750
US 60 Freeway Extension[1]	New four-lane freeway	$0	$117	$117
Local Bus Expansion-Capital[2]	Various locations	$201	$83	$284
Local Bus Expansion-Operating[2]	Various locations	$606	$249	$855
Paratransit-Capital	Various locations	$63	$24	$87
Paratransit-Operating	Various locations	$189	$75	$264
Subtotal		**$3,509**	**$1,786**	**$5,295**

[1] Cost reflects freeway construction

[2] Includes urban fixed-route and circulator

TABLE 8-5 (CONTINUED)
FOCUS AREA IMPROVEMENT SUMMARY (2002 cost in millions)

Improvement	Description	Maricopa Area Cost (millions-2002 $)	Pinal Area Cost (millions-2002 $)	Total Cost millions-2002 $)
GROUP II				
Apache Junction-Coolidge Corridor[1]	New roadway corridor	$0	$1,640	$1,640
Price Freeway Connection[1]	New roadway corridor	$390	$0	$390
East Valley Corridor[1]	New six-lane freeway	$860	$530	$1,390
Express Bus Expansion-Capital	Various locations	$26	$0	$26
Express Bus Expansion-Operating	Various locations	$80	$0	$80
Rural Access Service-Capital	Various locations	$3	$66	$69
Rural Access Service-Operating	Various locations	$6	$198	$204
Non-Motorized	Various locations	$10	$5	$15
Subtotal		**$1,375**	**$2,439**	**$3,814**
GROUP III				
New Arterials	Various locations	$373	$963	$1,336
UP Mainline Chandler-Capital	New High Capacity Transit Corridor	$226-$530	$0	$226-$530
UP Mainline Chandler-Operating	New High Capacity Transit Corridor	$70-$104	$0	$70-$104
Chandler Boulevard-Capital	New High Capacity Transit Corridor	$306-$684	$0	$306-$684
Chandler Boulevard-Operating	New High Capacity Transit Corridor	$38-$97	$0	$38-$97
Main Street-Capital	New High Capacity Transit Corridor	$185-$374	$0	$185-$374
Main Street-Operating	New High Capacity Transit Corridor	$54-$90	$0	$54-$90
Power Road-Capital	New High Capacity Transit Corridor	$237-$465	$0	$237-$465
Power Road-Operating	New High Capacity Transit Corridor	$33-$83	$0	$33-$83
UP Southeast-Capital	New High Capacity Transit Corridor	$567	$0	$567
UP Southeast-Operating	New High Capacity Transit Corridor	$160	$0	$160
Subtotal		**$2,249-$3,527**	**$963**	**$3,212-$4,490**
TOTAL		**$7,133-$8,411**	**$5,188**	**$12,321-$13,599**

[1] Cost reflects freeway construction