

September 2003



Northwest Area Transportation Study

FINAL REPORT

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prepared for



prepared by



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1. Study Purpose and Background

As the designated Metropolitan Planning Organization or MPO for the Maricopa region, the Maricopa Association of Governments (MAG) is developing a new Regional Transportation Plan (RTP). As part of the RTP development process, and at the request of local jurisdictions, MAG initiated three sub-area transportation studies¹ to provide background information and input to the RTP. This area study focuses on the Northwest portion of the region.

Related to this study, MAG also initiated a separate study for regional high capacity transit (HCT). Valley Metro similarly initiated a Regional Transit System (RTS) Study. Findings from these two transit studies conducted in parallel formed the basis for recommendations for transit in this study. More information on the transit and other background studies for the RTP may be found on the MAG Web page, located at www.mag.maricopa.gov.

The goal of the MAG Northwest Area Transportation Study (NWATS) is to identify transportation needs within the study area and develop a prioritized list of major transportation projects to address those needs. The highest ranked projects from that list will subsequently be assessed against competing regional projects as part of the RTP process, where the highest ranked projects will be selected for possible regional funding. In addition to identifying major projects for potential regional funding, this area study will provide a general long range

framework to prioritize and guide transportation development in the northwest.

1.1 Study Area

As shown in Figure 1, the study area is bounded by I-17 on the east, I-10 on the south, and the county lines on the west and north. While the study covered the entire area, the focus for recommendations is the developed or developing area, which generally lies east of the CANAMEX Corridor.

The study area includes El Mirage, Glendale, Litchfield Park, Peoria, Surprise, Wickenburg, and Youngtown. Additionally, portions of Avondale, Buckeye, Goodyear, Phoenix and Tolleson as well as unincorporated portions of Maricopa County are located within the study area.

1.2 Study Process / Methodology

The study was structured into separate tasks and produced the following working papers:

Working Paper #1: Review of Previous Studies

Working Paper #2: Socioeconomic Conditions

Working Paper #3: Transportation Data

Working Paper #4: Transportation Issues

Working Paper #5: Evaluation of Alternatives

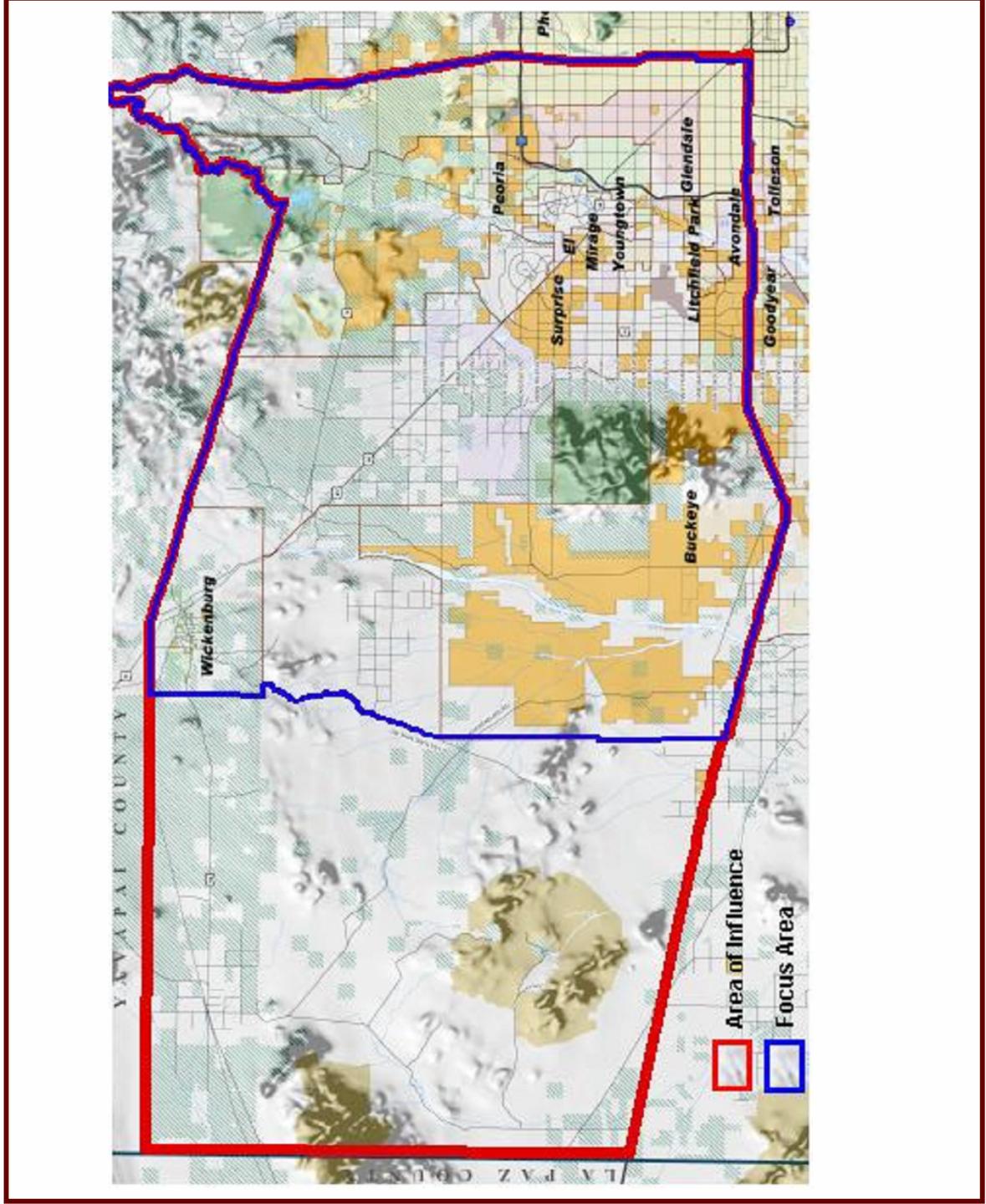
Working Paper #6: Recommendations

The Final Report is based upon the Working Papers and feedback on the papers received in consultation with the public, stakeholders and agencies, which occurred throughout the study process. The first three papers document key results from previous related studies as well as available information on growth and transportation in the northwest.

¹ Area studies for the southwest and southeast were also conducted. Separate area studies for central Phoenix and the northeast were declined by the local jurisdictions, which had already completed studies or otherwise wished to provide input to the RTP process directly.

Working Paper #4 documents transportation issues identified through the consultation process as well as technical analyses conducted for this study. Working Paper #5 presents alternative scenarios designed to address the identified transportation issues and assesses the scenarios against standard evaluation criteria. Finally, considering the assessment of alternatives and feedback received in consultation, recommendations for transportation improvements in the Northwest area are developed.

Figure 1: Study Area



Northwest Area Transportation Study

STUDY AREA

2. Review of Previous Studies

The Northwest Valley transportation needs have been heavily studied over the past ten 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 appears to reach slightly further into the future as plans for the Northwest area communities change, generally to higher levels of development. For purposes of understanding, the various products have been grouped into five categories based on their modal emphasis: general, highways, transit, bicycle/pedestrian and goods movement. The summaries of the various studies are presented in Appendix 1. Table 1 shows the salient points from each study reviewed.

The Northwest Valley transportation needs have been heavily studied over the past ten 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 appears to reach slightly further into the future as plans for the Northwest area communities change, generally to higher levels of development. For purposes of understanding, the various products have been grouped into five categories based on their modal emphasis: general, highways, transit, bicycle/pedestrian and goods movement.

General

Some studies cover a multimodal or non-transportation subject matter. These have been grouped and summarized in a “General” category. Among the studies in this category are the MCDOT Northwest Area Transportation Study and White Tank/Grand Avenue Area Plan, both of which covered much of the same area as NWATS. Though the horizon timeframe was different, the

underlying data was based on an earlier generation of the MAG model and the study area was confined primarily to the urbanized portion of the Northwest, the results may offer insights into the regional issues facing the area. At the same time, the Regional Congestion Study and the External Travel Survey begin to shape an understanding of some of the areas requiring improvement in the short term.

Studies Reviewed

- MAG FY 2002-2006 Transportation Improvement Program
- MAG Long Range Transportation Plan 2001 Update
- 1998 Regional Congestion Study
- MAG External Travel Survey
- MAG Desert Spaces
- MCDOT White Tank/Grand Avenue Area Plan
- MCDOT Northwest Area Transportation Study
- ITS Strategic Plan Update
- Transportation Elements of Municipal General Plans in Buckeye, Glendale, Peoria, Phoenix, Surprise and Wickenburg

Highways

Grand Avenue has been studied many times over the years. Its diagonal alignment across the highway grid system in the Northwest Valley and the parallel BNSF Railroad present many challenges that do not lend themselves to easy solutions. Only now, after years of discussion about strategies, are options being fully explored to address the unusual nature of the roadway and its significance in the area highway network. The latest reports propose the construction of grade-separated overpasses at critical locations to expedite traffic on Grand or one of the primary cross-

streets. The first of these projects is now underway at Thomas Road. Others will follow as funding becomes available.

Loop 303 is the topic that claims the broadest interest among Northwest Valley residents and businesses. The configuration, not the existence of the roadway, is the greatest question. Many would prefer a freeway type facility while others want a “parkway” that they perceive would limit heavy trucks and have less impact on adjacent properties. As things are, the travel demands in the growing area may require as much capacity as possible. The issue will be how to accomplish that with minimal negative environmental impacts.

The longstanding issue of an alternative route for commercial vehicles in Wickenburg continues to defy a widely acceptable and fundable solution. The impact of heavy traffic on the downtown has become more and more difficult to manage for the historic community. With traffic growth between Phoenix and Las Vegas, it begs the identification, once and for all of a route that can serve heavy vehicles. The alignment of the CANAMEX Corridor is viewed by Wickenburg officials as holding significant promise in their effort to remove heavy vehicles from the downtown environment while preserving local economic vitality.

Studies Reviewed

- Grand Avenue Major Investment Study
- Grand Avenue NW (Loop 101 to 303) Corridor Study
- Wickenburg SR 60/US 93 Realignment – Corridor Location Report
- 1996 Roads of Regional Significance
- East-West Mobility Study
- Bottleneck Study

Transit

There is still little transit service in the Northwest Valley. Most cities are beginning to recognize the need for alternatives as they grow, but funding has not as yet followed that realization. Only Phoenix and Glendale have dedicated sources of revenue for transit development and operation. Others, with more limited sources of revenue, are looking for a regional solution that would fold their needs into a regionally integrated plan.

Given this, studies (e.g., city transit plans) have been done by those communities that would like to establish a structure for future transit development. Surprise and Peoria have recently adopted transit plans into their General Plans and are using them in decisions related to new development projects in their areas. With RPTA’s help, Surprise is investigating an interjurisdictional proposal with some of its neighbors to offer a subregional circulator service among important local destinations. Glendale has the most well developed plan after Phoenix, but overall there has been limited regional vision about transit as part of anticipated growth plans and as a true travel choice in the future of the area.

Studies Reviewed

- Peoria Transit Plan
- Surprise Transit Plan
- Glendale Transportation Plan
- MAG Park and Ride Lot Study

Bicycle/ Pedestrian

The West Valley Rivers Master Plan is an ambitious program that calls for participation from many of the Northwest Valley cities. It will result in an extensive recreational amenity for the area when complete and will tie east and west Valley trails together. The new system can serve many needs, including some limited commuting and shopping given

its location in the New River and the Agua Fria River.

On the other hand, there is less information about “in town” bicycle programs. Again, Glendale and Phoenix have well-developed plans and are moving to implement them, but other cities have not yet been able to make that kind of commitment to bicycle mobility.

Studies Reviewed

- 1995 Pedestrian Area Plan Design Guidelines
- 1999 Pedestrian Plan Summary
- Bicycle Plan 1999
- West Valley Rivers Master Plan

Goods Movement

MAG and ADOT jointly initiated a study in late 1999 to develop a recommendation for the routing of the CANAMEX Corridor through the MAG region. The MAG Regional Council approved the recommendation for the corridor in April 2001. The alignment selected was at the western edge of the Valley included I-8, SR-85, I-10, and an alignment in the general vicinity of Vulture Mine and Wickenburg Roads connecting to the Wickenburg Bypass.

The ITS/CVO Business Plan was a review of ITS policies that would aid the commercial vehicle industry and help to mesh CVO traffic control and guidance practices with other ITS efforts underway at ADOT, Maricopa County and MAG.

At present, within the MAG region, most trucking is to and from sites within the Phoenix Metro area, and not attempting to bypass it. Many of those destinations are distribution centers along I-10 in Tolleson and Avondale. This pattern could change in the future, for example if major distribution centers move from their central urban locations to ones on the periphery of the urban center if lower costs can be achieved that way.

MAG Intermodal Study was to give people choices so they can select which mode or modes of travel that best meet their needs. In particular, the project’s goals were to enhance the capability of transportation facilities, whether public or privately owned to provide for the most efficient, cost-effective and least environmentally harmful means of traveling from place to place. In order to accomplish this, the intermodal system was defined as providing the greatest number of reasonable choices that enhances the connectivity between modes as well as increases the coordination among transportation-related decisions.

Studies Reviewed

- ITS-CVO Business Plan
- MAG Intermodal Management System Study
- Compilation of Evaluation Data for Designation of the CANAMEX Corridor through the Maricopa County Region

Table 1: Related Studies Summaries Review

Report or Study	Date	Jurisdiction	Summary
General			
MAG Transportation Improvement Plan 2002-2006	July 2001	Maricopa Association of Governments	Reflects five-year funded transportation capital improvement program for the region
MAG Long Range Transportation Plan 2001 Update	July 2001	Maricopa Association of Governments	Currently adopted long range transportation plan covering all modes and anticipated funding based on a trend assumption of regional and local funding sources.
Regional Congestion Study	September 2000	Maricopa Association of Governments	While not including the entire Northwest Valley, this study focuses on those cities immediately adjacent to the I-17/I-10 corridors, and the SR 101 corridor. Peak hour travel congestion is detailed in the study, as well as the level of service of the freeway segments within this study.
Phoenix Area External Travel Survey	March 5, 2001	Maricopa Association of Governments	This survey was performed as part of the MPO responsibility to maintain the regional travel demand forecast model. In regard to the Northwest Valley Study Area, four survey stations were established to survey motorists concerning their respective origin-destinations of their trips. Both Internal-External and External-External trips were surveyed and tabulated. The results were that 46% of all trips in Maricopa County were Internal-External.
Desert Spaces Plan	April 1995	Maricopa Association of Governments	The concept plan provides a framework for Northwest Valley jurisdictions regarding land use planning and preservation and conservation of open spaces. Specifically mentioned, are the Aqua Fria and New Rivers as recreational trails to link with major roadways and residential developments. The White Tank Regional and Thunderbird Parks are also detailed on how regional bikeways, pathways and trail system could link these recreational destinations and tie into the regional roadway network to provide transportation linkages.
Desert Spaces: Environmentally Sensitive Development Areas Policies and Design Guidelines	June 2000	Maricopa Association of Governments	This follow-up study to the Desert Spaces Plan provides a land use policy framework for Northwest Valley jurisdictions when planning new developments near environmentally sensitive areas. Included are specific considerations such as, pedestrian friendly development design, transit-oriented design and recreational trails to link to regional parks and river course ways.
White Tank/Grand Avenue Area Plan	2000	Maricopa Association of Governments	The goals and objectives in this plan provides the benchmark in three-dimensional sub-regional planning incorporating quality of life enhancements by recommending alternate mode transit planning to reduce congestion within the Northwest Valley. Benefits such as coordinated planning between public and private agencies and developers to encourage alternate modes in new development design and transportation improvements.
Northwest Valley Transportation Study	2000	Maricopa County DOT	Study assessed transportation needs for all modes in the Northwest part of urbanized Maricopa County.
MAG ITS Strategic Plan Update	2001	Maricopa Association of Governments	The Strategic Plan was undertaken to define the future structure, planning and programming needs and responsibilities for ITS in Maricopa County following the success of the FHWA Model Deployment Initiative (AzTech). The plan recommends: 1) specific architecture objectives to ensure compatibility among jurisdictions, 2) a telecommunications plan that would move away from leased lines in favor of a WAN for ITS, 3) establishing MAG ITS Committee as the guidance and regional champion and 4) lays out a series of implementation strategies to ensure interjurisdictional coordination and compatibility.
Buckeye General Plan	1989	Town of Buckeye	The General Development Plan is a statement of the Town of Buckeye's community goals and development policies. It is to be used by the Town Council as a decision-making guide for the physical development and redevelopment of the Town. The General Development Plan offers community goals and objectives indicating how the Town would like to develop in the foreseeable future.
Glendale Transportation Plan	2001	City of Glendale	The Glendale Transportation Plan is a guide for the development of transportation in the Glendale Planning Area for the years 2000 through 2025. Current conditions and future prospects are addressed with plans for each mode of transportation.
Peoria General Plan	2000	City of Peoria	The Peoria General Plan presents goals, objectives, and policies which identify Peoria's priority for land use and development.

Phoenix General Plan	2001	City of Phoenix	The Circulation element of the General Plan discusses how to reduce the rate of increased traffic congestion, which is increasing faster than population growth. According to the General Plan, Phoenix needs to promote more alternatives to driving alone and to decrease the number and length of trips.
Surprise General Plan	2000	City of Surprise	The objective of the Transportation/Circulation element of the General Plan is to ensure that residents and visitors have a safe, efficient, effective, and convenient multi-modal transportation system. The system provides internal efficient travel connections while providing access regionally. The Transportation/Circulation element strives to complete the grid system. It is a priority to restrict developers from inhibiting construction of arterial roadways along section lines.
Wickenburg General Plan	2000	Town of Wickenburg	The Transportation element of the General Plan identifies the general location and extent of existing and proposed major arterials, collector streets and street classifications. It considers multi-modal transportation options including transit, pedestrian and bicycle alternatives.
Highways			
Grand Avenue MIS (I-17 to Loop 101)	1999	Arizona Department of Transportation	With the objective to expedite traffic flows, the report makes recommendations to eliminate all six-legged intersections along Grand Ave using a variety of techniques, mostly grade separations. The plan also provides for some transit and alternative mode accommodations, though they are not a primary focus of the study. Mention is made of the possibility of a future expressway subject to a number of provisos related to row acquisition and elimination of local streets. Cost estimate for the entire program is over \$500 million.
Grand Avenue Study (Loop 101 to Loop 303)	Underway	Arizona Department of Transportation	Project has identified grade separations of various types as possible solutions, but has not yet arrived at a final set of recommendations. There is still discussion about key locations such as Bell Road/Grand and areas that have been introducing new traffic controls.
US 60 – US 93 Wickenburg Realignment Corridor Location Report	1998	Arizona Department of Transportation	This study reviewed opportunities to identify and evaluate possible highway corridors connecting US 60 and US 93 around downtown Wickenburg. Two alignments (one east and one west) were recommended for further study, but none has been selected for implementation.
Roads of Regional Significance Evaluation	January 1996	Maricopa Association of Governments	Included in this evaluation, is the examination of upgrading of regionally significant roadways to accommodate bicycle facilities. This includes the 119 miles of roadways within the Study area that also incorporates the design guidelines to meet the Arizona Bicycle Facilities Planning Design Guidelines.
East-West Mobility Study	Underway	Maricopa Association of Governments	Analysis of opportunities for better or additional improvements in the Northern-Beardsley Corridor from Loop 303 to SR 51
Freeway Bottleneck Study	Underway	Arizona DOT/ Maricopa Association of Governments	Study of freeway bottlenecks and solutions for future funding consideration
Transit			
Peoria Transit Plan	November 2000	City of Peoria	Plan developed to meet objectives for long-range multimodal options in the City. Focus is on dial-a-ride in the short term, with provisions for more fixed route service in the long term.
Surprise Transit Plan	September 2001	City of Surprise	City developed plan to provide for choices. Like Peoria, focus was on expansion of dial-a-ride in short term and fixed route or even high capacity in the long term. Working with RPTA and adjacent cities to set up a circulator to serve specific destinations.
Glendale Transportation Plan	2001	City of Glendale	Plan was develop to address city's transportation needs from bus bays and road widenings to light rail. Served as basis for successful sales tax election in November 2001
Park and Ride Report	January 2001	Maricopa Association of Governments	Study identifies the four existing Park & Ride facilities within the Northwest Valley Study area. Included in this report are the future planned Park & Ride facilities including their respective location, size, and cost and design guidelines to accommodate and encourage the use of transit.

Bicycle/Pedestrian			
Bicycle System Plan	April, 1999	Maricopa Department of Transportation	The plan's regional context applies to the Northwest Valley in that the overall plan recommends that the County double the number of bike lanes within the county, incorporate bicycle facilities in new roadway design and improvements; and to recognize and evaluate bicycle facilities as a viable alternate mode for commuting within the Study Area. Organizational and facility changes to institute these recommendations are also detailed.
Pedestrian Plan 2000 Final Report	December 1999	Maricopa Association of Governments	An update to the MAG 1993 Study, this plan recommends the inclusion of pedestrian facility guidelines into the Maricopa Department of Transportation roadway design guidelines. This includes new roadway construction, as well as retrofitting existing roadways with specific pedestrian-friendly designed facilities to encourage pedestrian activity.
Pedestrian Area Plan Design Guidelines	October 1995	Maricopa Association of Governments	Plan provides a comprehensive plan for the utilization of public/private funds for the installation of pedestrian facilities within the study area. Included are recommended design criteria and placement of facilities and amenities to improve and promote pedestrian activities.
West Valley Rivers Master Plan		Maricopa Association of Governments/Flood Control District of Maricopa County	Sets forth a plan to improve the New and Agua Fria River flood control corridors with bicycle and pedestrian amenities.
Goods Movement			
ITS/CVO Business Plan Study	March, 1998	Arizona DOT	Business plan concentrates on Freeway management system and the variable message signs installed along the study area freeways to improve mobility. Utilizing ITS to improve mobility through effective communication to motorists and motor carriers of roadway travel conditions. Plan also details methods to improve streamlining of motor carrier freight permitting and inspection processes.
Intermodal Management Plan	April, 1995	Maricopa Association of Governments	Plan examined the methodologies in providing area residents choices in transportation modes, and developing ways to expedite the transfer from one mode to another. Specific recommendations in developing public/private partnerships to accommodate the ease of transferring from one mode of travel to another to enhance the social and environmental benefits to maintain and improve the quality of life in the Northwest Valley.
CANAMEX Corridor	August 2000	Arizona DOT	Study addressed the needs of an international corridor for goods transportation through Maricopa County to support increased activity expected as a result of NAFTA. In NWATS, the alignment is along Vulture Mine and Wickenburg Roads between I-10 and US 93.

3. Consultation Process

Determining how the Northwest Area identifies its needs and how it resolves differences about these needs was an important part of the study. To that end, a Consultation Program was created to develop a consensus among stakeholders that the study is thorough, addresses their needs and concerns, provides a vision for the area, and will result in a plan of investments for the area that can be implemented.

Based on identified issues and experience from consultation on previous studies, the goals for this consultation program and the objectives for meeting those goals are as follows:

1. Inform, educate, and engage people/agencies early and continuously throughout the planning process.
2. Provide opportunities for early and continuing public participation in the decision-making process and encourage participation.
3. Respond to participant issues and concerns clearly and understandably.
4. Obtain input from a broad range of citizenry by using a variety of techniques.
5. Review participant comments and integrate them into transportation plans as appropriate.
6. Maintain consistency with MAG's RTP consultation process, the ongoing general MAG public involvement process, and

any relevant local jurisdictional public involvement/consultation processes.

The structure of the Consultation Program was designed to encourage stakeholder/public initiative and comment and provide opportunities for meaningful communication between the study team and the stakeholders. Stakeholders were categorized into target audiences, based on commonality of interests, use of existing organized groups, geographic location, and/or existing official structure.

- Elected Officials
- Agency Stakeholders
 - Representatives from the participating cities
 - Representatives from other interested jurisdictions and agencies
- Community Stakeholders / General Public
 - Neighborhood Groups
 - Businesses
 - Professional Organizations
 - Civic Organizations / Local Advisory Groups
 - Individuals

3.1 Consultation Program Activities

Consultation activities were closely linked and integrated with study milestones. Each activity was specifically designed to meet one or more of the consultation program goals. See Table 2 on the next page.

Table 2: Activities/Goals Matrix

Consultation Activities	Consultation Program Goals					
	Goal 1: Inform, Educate, Engage	Goal 2: Provide Opportunities	Goal 3: Develop Accountability, Credibility, Accessibility	Goal 4: Reach Broad Range	Goal 5: Consider and Incorporate Comments	Goal 6: Maintain Consistency with other Public Involvement Processes
Newsletters	●			●		●
Summary Reports			●		●	
Public Open House Meetings	●	●	●	●		●
Stakeholder Interviews	●	●	●			●
Agency Forum Workshops	●	●	●			●
Displays	●	●	●	●		
Website	●	●	●	●		●
Study Tour	●	●	●			

3.2 Summary of Consultation Activities

Throughout the course of the study, numerous meetings and workshops were held, including a tour of the study area with representatives of the participating agencies (see Table 3).

Agency Forum Workshops were an important part of the study as they provided opportunities for the participating agencies to meet in a small to mid-size group and discuss in detail the various transportation options considered, modeling data, and estimated costs. Four Agency Forum Workshops were conducted.

Two public open house meetings were conducted, providing additional opportunities for all stakeholders and the general public to obtain information about the study and provide input.

Additionally, interviews with representatives of individual agencies and stakeholder groups were conducted. Representatives typically included planning staff, town/city managers, and department heads.

Each interviewee completed a survey soliciting input on existing conditions and opinions on transportation improvement priorities. The results of those surveys were considered in the final recommendations. Interviewees included:

- Town of Buckeye
- City of El Mirage
- City of Peoria
- City of Phoenix
- City of Surprise
- Town of Youngtown
- Town of Wickenburg
- Regional Public Transportation Authority

- Sun City Grand Homeowners Association
 - Sun City Property Owners and Residents Association (PORA)
 - Westmarc
 - Bureau of Land Management
- Interviews were also offered to Mayors of participating jurisdictions and conducted with:
- Mayor Joan Shafer, Surprise
 - Mayor Lon McDermott, Wickenburg
 - Mayor Dusty Hull, Buckeye
 - Mayor John Keegan, Peoria, and
 - Mayor Roy Delgado, El Mirage

Table 3: Consultation Events for the MAG NW Area Transportation Study

Agency Kick-off Meeting	Tuesday, November 13, 2001 Surprise City Hall 12425 West Bell Road, Surprise
Study Area Tour – Elected Officials	Wednesday, May 1, 2002 12:00 noon – 3:00 p.m.
Agency Forum	Monday, July 1, 2002 1:30 p.m. Glendale Main Library, Large Meeting Room 5959 W. Brown Street, Glendale
Open House and Public Meeting	Tuesday, September 17, 2002 6:30 – 8:30 p.m. Glendale Community College Student Lounge, Glendale
Agency Forum	Monday, December 9, 2002 1:30 p.m. Peoria City Hall, 8401 West Monroe, Pine Room, Peoria
MAG Transportation Review Committee Presentation	Thursday, January 30, 2003 MAG, 301 N. 1 st Avenue, Saguaro Room, Phoenix
Agency Forum	Wednesday, February 19, 2003 10:00 a.m. Glendale Civic Center – Boardroom 5750 W. Glenn Drive, Glendale 85301
Agency Forum	Tuesday, April 29, 2003 10:00 a.m. City of Surprise Council Chambers 12425 West Bell Road, Surprise
Open House and Public Meeting	Tuesday, April 29, 2003 5:00 – 7:00 p.m. Alta Loma Elementary School 9750 N. 87th Avenue, Peoria

These activities generated significant discussion and input in addition to refining the base data used to develop the final recommendations. Results of the Consultation process were incorporated into

the identification of issues phase of the project (see Section 6, Transportation Issues in this report) and into the final results of the study (see Section 8, Recommendations).

4. Socioeconomic Conditions

The basis for planning future transportation investments rests in a good prediction of future residential and commercial growth patterns. This working paper describes the trends evident in future growth in the Northwest Valley and the socioeconomic data developed for the analysis of future transportation needs in the area. As part of the discussions in this analysis, location and potential implications to Title VI/Environmental Justice populations are evaluated in the context of future growth patterns and needed transportation improvements.

The data used to assess future conditions were developed by MAG for use in the RTP. Interim (“draft 2”) socioeconomic data from the MAG RTP update were used for this study, with assigned horizon years of 2020 and 2030. As is typical for long-range forecasts, actual population and employment may reach these forecast levels a few years earlier or later than assumed in the forecasts. The study therefore focuses on the transportation system and services needed to support the projected future levels of population and employment in the northwest, and not on the precise years in which those levels may be reached.

4.1 Base Year 2000 Socioeconomic Overview

MAG base year 2000 socioeconomic data was provided by traffic analysis zone. It includes 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.

4.1.1 Population

Base year (2000) population counts are shown in Table 3. Base year population distribution patterns in the Northwest area are indicated in Figure 2. TAZs in the southeastern sector of the study area, closest to the center of the urbanized area, have densities as high as 5,000 persons per square mile. These densities generally decrease to the north and the west.

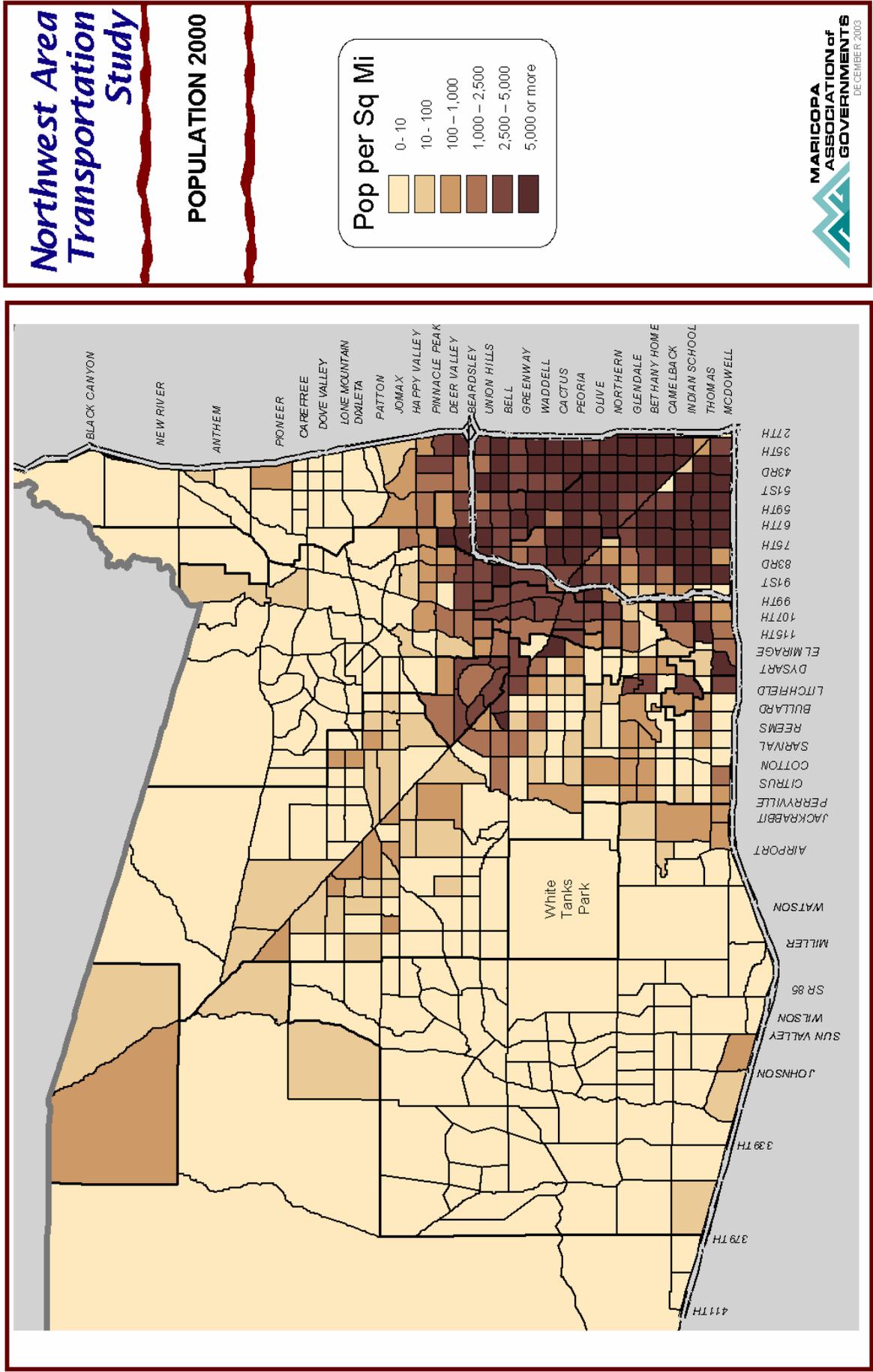
Higher densities follow the Grand Avenue corridor to Sun City and parts of Surprise where development patterns in the retirement communities are relatively compact. Still, most of the acreage in the study area is only sparsely populated. Some of these low-density areas will remain so because of protected status as parks and/or environmental preserves, but large tracts of land remain available for development to the north and west of current urban densities.

Table 4: Population Year 2000

MPA	Year 2000 Population
Avondale	19,145
Buckeye	2,954
County	65,738
El Mirage	8,723
Glendale	230,286
Goodyear	8,868
Litchfield Park	3,831
Peoria	114,142
Phoenix	414,549
Surprise	37,746
Wickenburg	7,419
Youngtown	3,013
Total Study Area	916,414
Total Region	3,135,944

Note: Does not include seasonal or transient population

Figure 2: Population Density Year 2000



Many of the Northwest Valley communities have vast incorporated areas that have been zoned for generally low density residential, but there are pockets of intensity around future employment or government centers that will be defining hubs for the transportation system. Buckeye and Surprise are prime examples of this type of change. Buckeye has plans for over 150,000 homes and associated employment distributed in a balanced pattern west of the White Tank Mountains. Surprise is beginning development of a new government/sports/retail complex near Bell Road and Loop 303 that will provide a major anchor to that part of the Northwest Valley and be a focus of transportation activity in the future.

4.1.2 Employment

Base year (2000) employment (Table 4) shows a pattern similar to that of population, with higher densities in the southeastern sector. The employment pattern of the Northwest Valley has historically been focused toward the southeast in Glendale, Phoenix, and other cities. Until recently, the employed population in outlying areas dwindled quickly as it approached retirement communities in the Sun Cities. A few newer employment nodes have begun to appear farther out along the major transportation corridors. Among them are the areas near Lone Mountain Road and as far north as

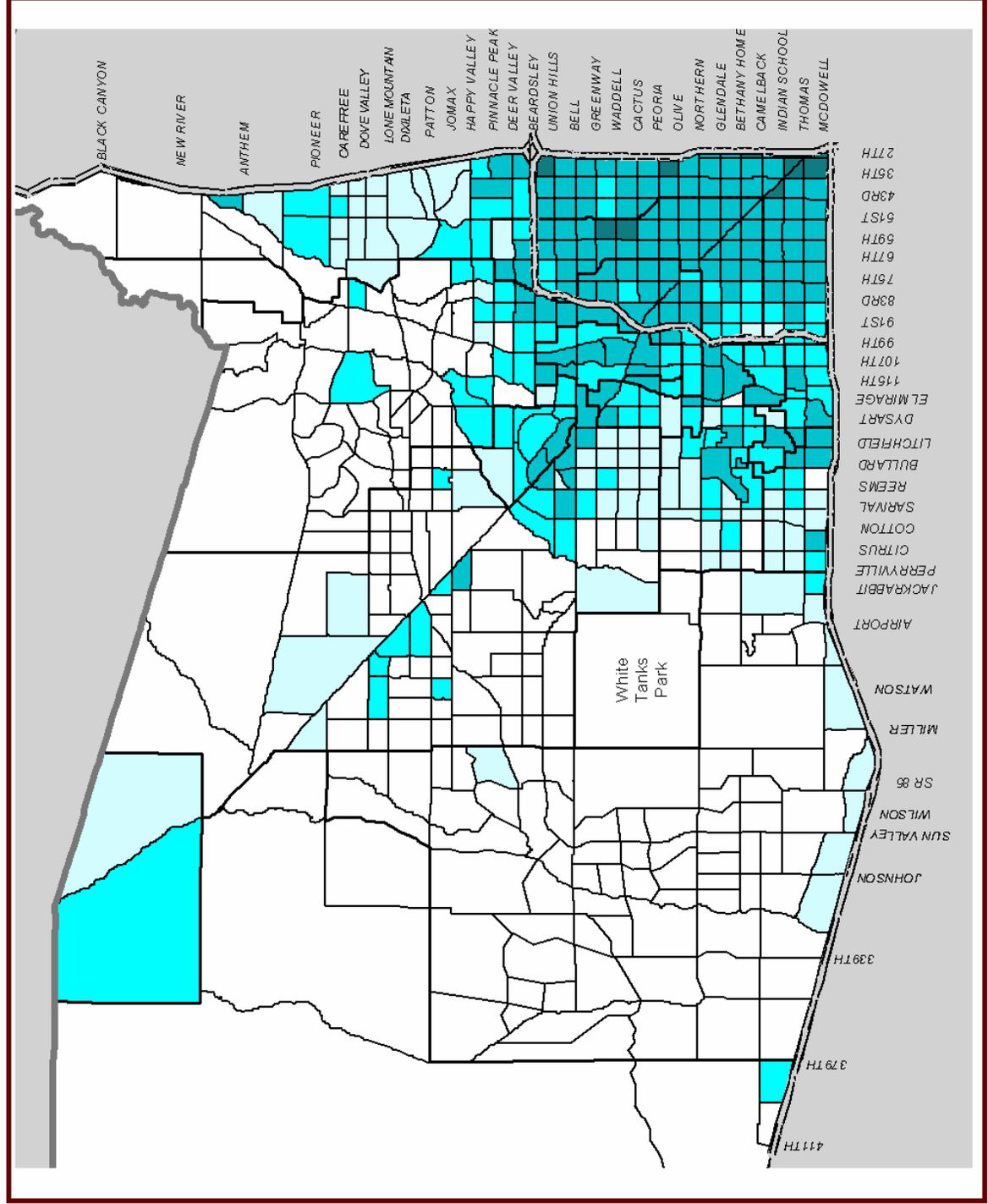
Anthem along north Interstate 17 and in Surprise along Grand Avenue.

The outward trend is putting pressure on transportation facilities. Freeways to the west and north and Grand Avenue are becoming more congested as employment spreads further away from the urban center. Major new transportation facilities in planning stages will improve access to additional areas that will help mitigate areas of the new employment travel demand, but will also open opportunities for further development.

Table 5: Employment Year 2000

MPA	Year 2000 Employment
Avondale	3,236
Buckeye	538
County	20,546
El Mirage	1,885
Glendale	84,542
Goodyear	6,299
Litchfield Park	1,178
Peoria	28,359
Phoenix	111,757
Surprise	8,999
Wickenburg	4,052
Youngtown	1,224
Total Study Area	272,615
Total Region	1,640,297

Figure 3: Employment Density Year 2000



4.2 Socioeconomic Projections

The data used to assess future conditions were developed by MAG for use in the RTP. Interim (“draft 2”) socioeconomic data from the MAG RTP update were used for this study, with assigned horizon years of 2020 and 2030.

4.2.1 Population

These projections show high-density clusters, as high as 5,000 persons per square mile and higher, spreading and “leap-frogging” to areas far outside the existing urban core. As indicated in the previous section, the Buckeye and Surprise MPAs in particular showed remarkable growth, as do portions of Phoenix along I-17. This is consistent with expectations given the substantial land available for future growth in the Northwest Valley. Results of the data preparation effort show that over the next 20 to 40 years growth will reflect a new emphasis on West Valley development as land in other parts of the valley becomes less available and more expensive. Major developers have begun to concentrate significantly more interest in the large expanses of land available at reasonable cost in the West Valley. This will be particularly true in the planning areas of Buckeye and Surprise, which are only now beginning to explore their opportunities with the development industry and major housing/employment projects.

Because of the forecast changes, the study area population doubled by 2020 and increased another 60% by 2030. In 2020, the study area population for the Buckeye MPA increases from 3,000 to over 400,000, an increase of over a

hundred-fold. The population of Surprise increases eight-fold from 38,000 to 290,000 in that same timeframe. While these are among the largest, increases occur in all communities in the Northwest Valley.

From the perspective of managing the transportation system, the most effective response to these growth trends is the definition of at least the structure of the network needed to address transportation challenges in the developing areas as soon as possible. The objective should be to prepare the transportation system in the newly expanding areas to function as efficiently as possible when built, but with room for expansion and modal options. Early planning and programming allow development of the transportation system to occur concurrent with or as part of land use implementation. If memorialized in both regional and local documents, they also strengthen the credibility of local plans in discussions with the development community.

4.2.2 Employment

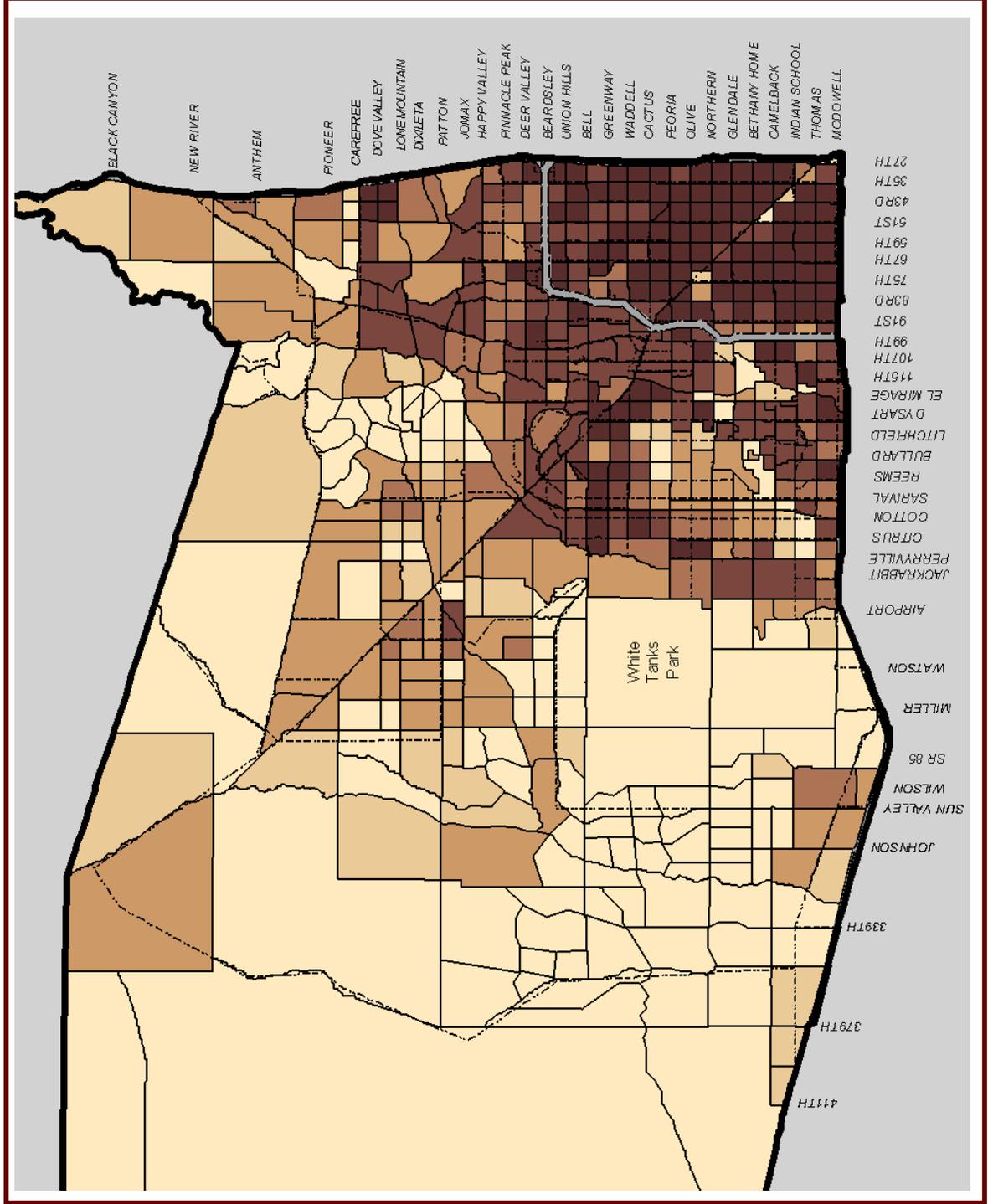
The employment levels keep pace with the population growth in the projections. The local jurisdictions have planned for a large amount of commercial development. Already, the predominant pattern of travel to Downtown Phoenix for work has begun to spread more broadly to other areas throughout the Northwest Valley as new employment centers are built along the major freeway and arterial corridors. Many communities view employment as a major part of future development. This reflects a significant change in perspective and vision compared to past experience and could result in more employment development in outlying areas to support new housing projects that will be far from

existing employment opportunities. However, because of the need to maintain a regionwide jobs/housing balance, the scenario totals finally formulated were sometimes lower than those expected by the local jurisdictions.

Depending on the long term relationship of new employment locations to new residential development, this could exacerbate the transportation problem or

lead to better balancing between where people live and where they work. In general, should the relationship shift away from balance, there will be a greater need for transportation improvements. In other words, maintaining the regional jobs/housing balance could prevent some growth areas (e.g., Buckeye) from reducing regional travel to existing employment centers.

Figure 4: Population 2020



Northwest Area Transportation Study

"Draft 2"
POPULATION
2020

Pop per Sq Mi

- 0 - 10
- 10 - 100
- 100 - 1,000
- 1,000 - 2,500
- 2,500 - 5,000
- 5,000 or more

Figure 5: Population 2030

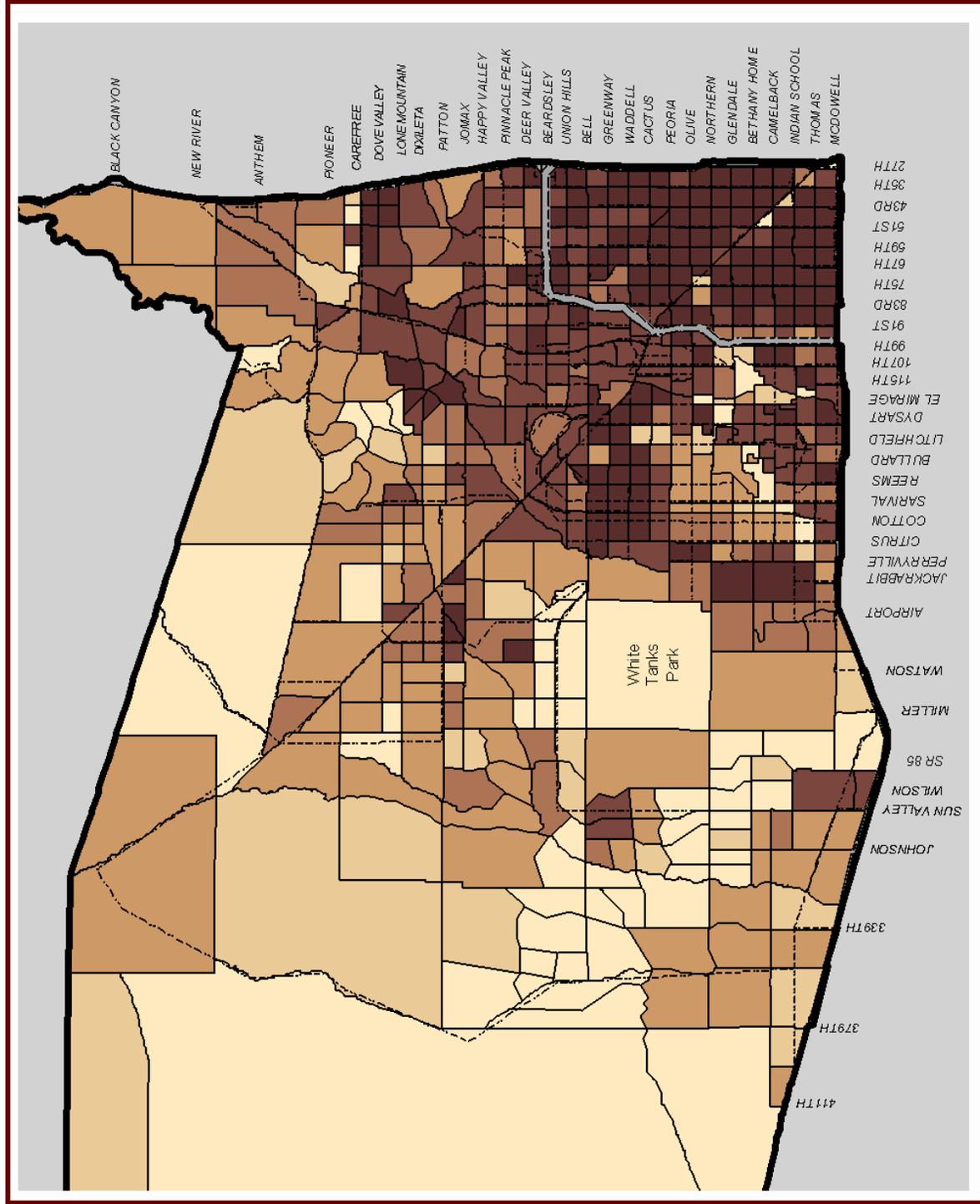


Figure 7: Employment 2030

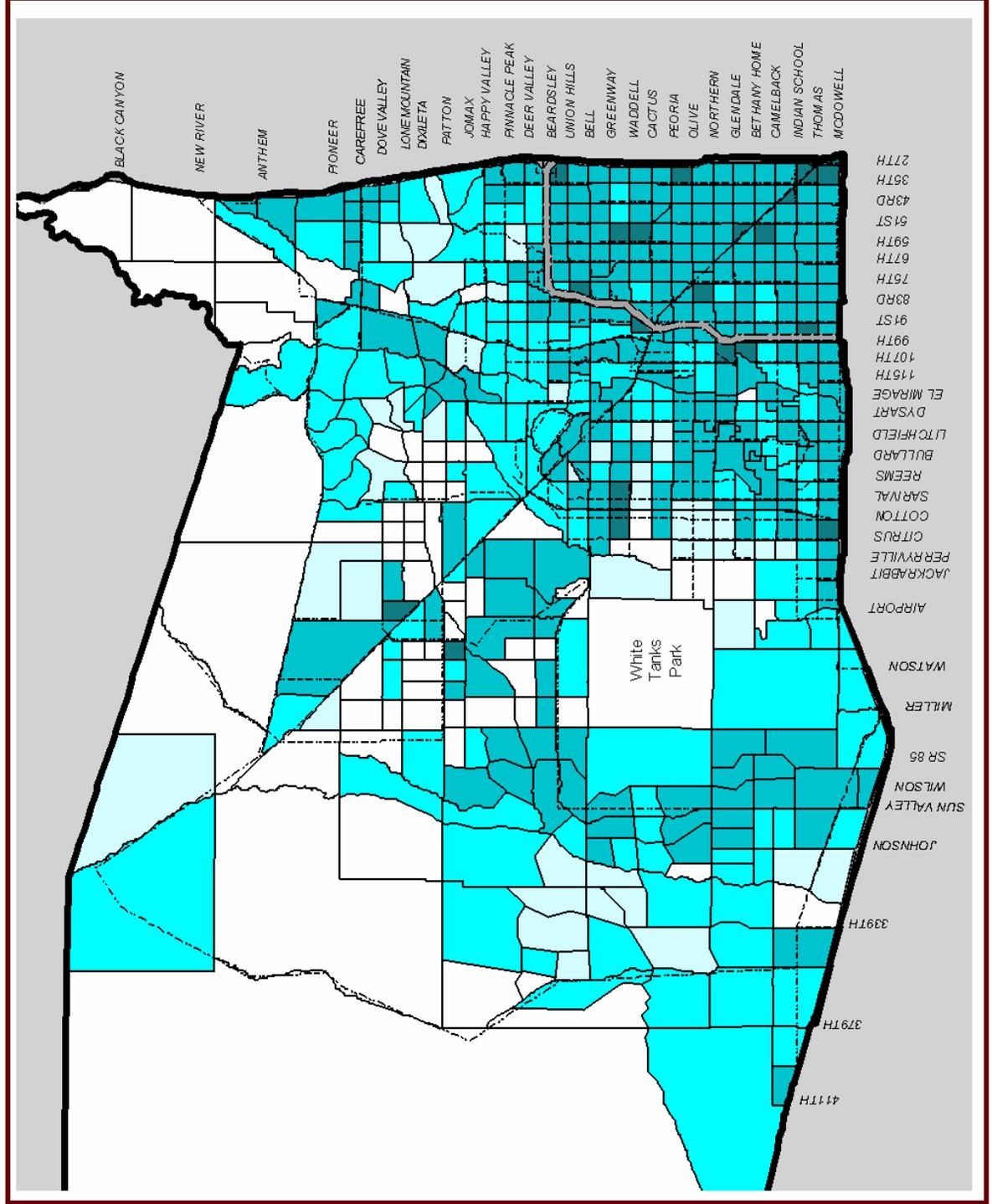


Table 6: Population within the Study Area*

MPA	2000 Population	2020		2030	
		Population	Increase Over 2000	Population	Increase Over 2000
Avondale	19,145	37,231	94%	37,325	95%
Buckeye	2,954	59,570	1,917%	201,309	6,715%
County	65,738	82,209	25%	118,201	80%
El Mirage	8,723	44,696	412%	51,186	487%
Glendale	230,286	308,854	34%	311,693	35%
Goodyear	8,868	33,136	274%	40,892	361%
Litchfield Park	3,831	14,095	268%	14,573	280%
Peoria	114,142	250,391	119%	349,639	206%
Phoenix	414,549	547,697	32%	590,357	42%
Surprise	37,746	210,629	458%	345,510	815%
Wickenburg	7,419	9,956	34%	18,766	153%
Youngtown	3,013	6,395	112%	7,170	138%
Total Study Area	916,414	1,604,859	75%	2,086,621	128%
Total Region	3,135,944	5,525,548	69%	6,815,583	103%

Note: Does not include seasonal or transient population. "Draft 2" data superseded in RTP.

Table 7: Employment within the Study Area*

MPA	2000 Employment	2020		2030	
		Employment	Increase Over 2000	Employment	Increase Over 2000
Avondale	3,236	18,587	474%	23,944	640%
Buckeye	538	19,432	3,512%	63,168	11,641%
County	20,546	27,578	34%	38,682	88%
El Mirage	1,885	17,701	839%	24,904	1221%
Glendale	84,542	160,344	90%	192,053	127%
Goodyear	6,299	29,002	360%	41,818	564%
Litchfield Park	1,178	5,059	329%	4,703	299%
Peoria	28,359	98,114	246%	153,098	440%
Phoenix	111,757	178,519	60%	247,680	122%
Surprise	8,999	55,310	515%	123,181	1,269%
Wickenburg	4,052	6,304	56%	12,214	201%
Youngtown	1,224	1,655	35%	1,713	40%
Total Study Area	272,615	617,605	127%	927,158	240%
Total Region	1,640,297	2,918,881	80%	3,668,663	123%

Note: "Draft 2" data superseded in RTP.

4.3 Additional Variables

The complete list of EMM2 trip generation inputs is shown in Table 8.

Table 8: MAG EMM2 Socioeconomic Data Input File Format

Field	Start	Length
Year	1	6
Traffic Analysis Zone (TAZ)	7	6
District	13	6
Metropolitan Planning Area (MPA)	19	A3
Resident population in households	22	6
Resident population in Group Quarters	28	6
Transient population	34	6
Seasonal population	40	6
Number of Residential households	46	6
Number of Group Quarter households	52	6
Number of transient households	58	6
Number of seasonal households	64	6
Other employment	70	6
Public employment	76	6
Retail employment	82	6
Office employment	88	6
Industrial employment	94	6
Number of households with income \$0 – \$15k	100	6
Number of households with income \$15 - \$25	106	6
Number of households with income \$25 - \$35	112	6
Number of households with income \$35 - \$50	118	6
Number of households with income \$50+	124	6
Total Area (sq mi)	130	F8.2
Office Area (sq mi)	138	F8.2
Post HS enroll	146	6
Retirement zone flag	152	6
Sky Harbor Emplanements	158	6
Number of dwelling units age 0 – 9 (years)	164	6
Number of dwelling units age 10 - 19 (years)	170	6
Number of dwelling units age 20 – 30 (years)	176	6
Number of dwelling units age 30+ (years)	182	6
Number of multifamily dwelling units	188	6
Number of single family dwelling units	194	6

4.4 Title VI – 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 populations with limited resources for self-advocacy. Specifically, all federally-funded projects must demonstrate that minority, low-income, and disadvantaged populations have been identified and brought into the process, and that the negative impacts of the project do not disproportionately impact 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 signed by President Clinton in February 1994 provided further guidance for federal agencies in carrying out Title VI. US DOT ORDER 5680-1 addresses the process by which the US DOT will implement the principles of the law:

- The identification and location of low-income and minority populations;
- Community outreach with environmental justice populations; and
- The evaluation and analysis of the impacts of the transportation projects on target populations with an assessment of whether they will produce disproportionately high and adverse human health or environmental effects on the target populations.

4.4.1 Title VI and Environmental Justice Populations

Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national origin. 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. Executive Order 12898 and the DOT and FHWA Orders on Environmental Justice address persons belonging to any of the following groups:

- 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.
- Low-Income - a person whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines.

Several additional populations were also evaluated for this study, including: Disabled Population; Population over Age 60; and Female Headed Households. Countywide and statewide statistics on the measures are included in Table 9.

Table 9: Title VI Populations

	Total Population	Percent of Population					Percent of Households
		Minority	Hispanic	Over Age 60	Below Poverty	With a Disability	Female Head of Household
Maricopa County	3,072,149	34%	25%	15%	12%	18%	27%
Arizona	5,130,632	36%	25%	17%	14%	19%	27%

4.4.2 Poverty

For purposes of this study, Census 2000 data was mapped at the census tract level. The Northwest area has several pockets where the poverty levels are quite high, but, in general, poverty is low in the Northwest

Valley. These areas are largely found closer to existing urban facilities with a definite pattern following the Grand Avenue corridor north. A high percentage of the population west of Wickenburg Road is also below the poverty level.

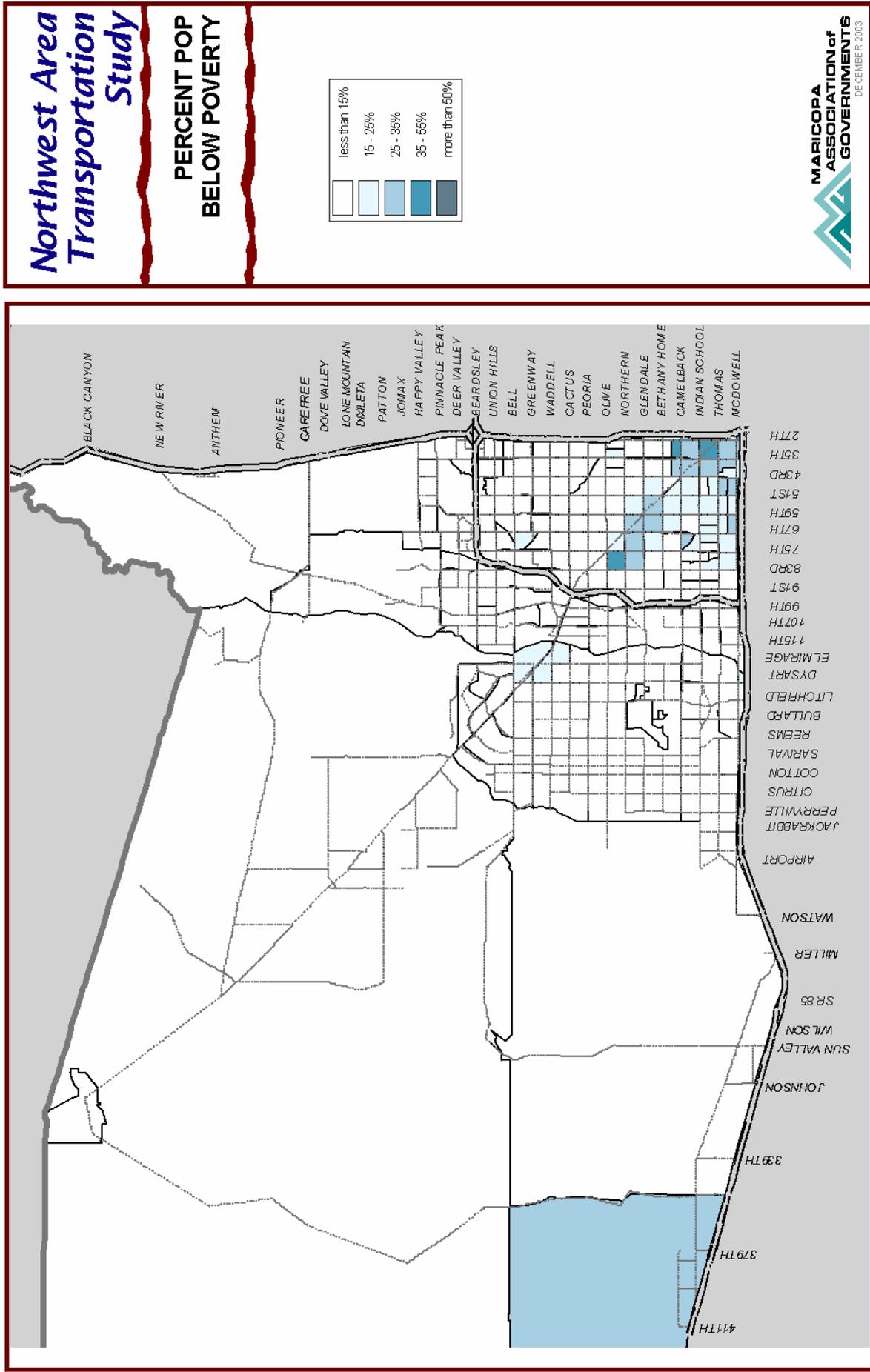
Table 10: 2001 HHS Poverty Guidelines

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

For the 48 continuous states and D.C.

Source: Federal Register, Vol. 66, No. 33, February, 16, 2001, pp. 10,695-10,697.

Figure 8: Percent Population Below Poverty



4.4.3 Minority Population

Minority population was identified as “Non-White Hispanic” and “Non-White Other Population.” The statewide and countywide average percent minority population is approximately 35%; the Northwest area has many areas where the target population exceeds this figure. Some exceptionally high figures are found in the southeast portion of the study area, with one additional area of concentration in El Mirage.

Most of these populations have ready access to the transportation system and will benefit further from public transportation efforts in Phoenix and Glendale. Some focus will need to be placed in El Mirage to ensure these residents are not negatively impacted and can be helped by future plans.

4.4.4 Percent Population Disabled

The Census 2000 used the following definition of disability status:

“For data products that use a disability status indicator, individuals were classified as having a disability if any of the following three conditions were true: (1) they were 5 years old and over and had a response of “yes” to a sensory, physical, mental or self-care disability; (2) they were 16 years old and over and had a response of “yes” to going outside the home disability; or (3) they were 16 to 64 years old and had a response of “yes” to employment disability.”

The highest concentration of this target group is associated with the retirement communities in Sun City and Sun City West. For this reason the distribution map for this group is similar to that of the next target group, Population Over Age 60.

4.4.5 Percent Population Over Age 60

The highest concentrations of Population over Age 60 areas are found in the Sun City and Sun City West areas. But a very large area with 35-55% over 60 is also seen to the northwest of these areas. This is a very large low density census tract that includes several retirement communities. In this 12,000 square mile tract, approximately 7,000 of the total 15,000 population are above age 60.

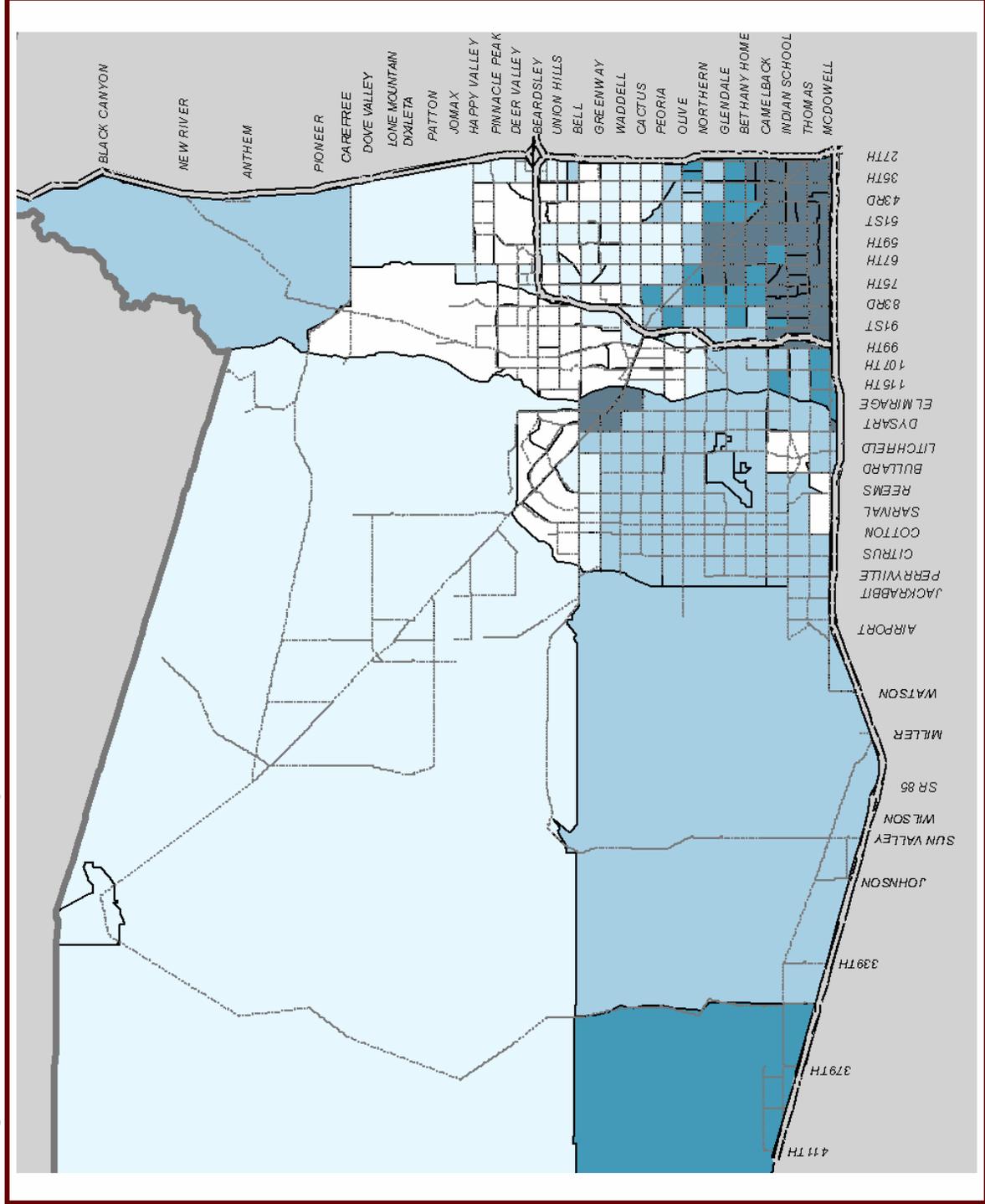
4.4.6 Percent Female Headed Households

Female Headed Households show the least distinct pattern of the selected target populations. However there does seem to be a correlation with the Over Age 60 population. This would be consistent with demographic patterns of women having a higher life expectancy than men.

4.4.7 Implications for Paratransit Services

Disabled and elderly populations are most reliant on paratransit services. While the Sun Cities offer good service within their communities, there is a lack of regional dial-a-ride options in much of the areas highlighted in Figures 10 and 11. Because so much of the affected area is far to the northwest where population is very low, there may not be possible to offer service to all identified target areas. Cost and travel time would be a major detriment when balanced against the low number of beneficiaries.

Figure 9: Percent Minority Population



Northwest Area Transportation Study

PERCENT MINORITY POPULATION

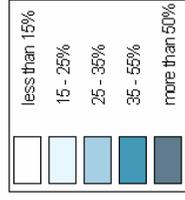


Figure 10: Percent Disabled Population

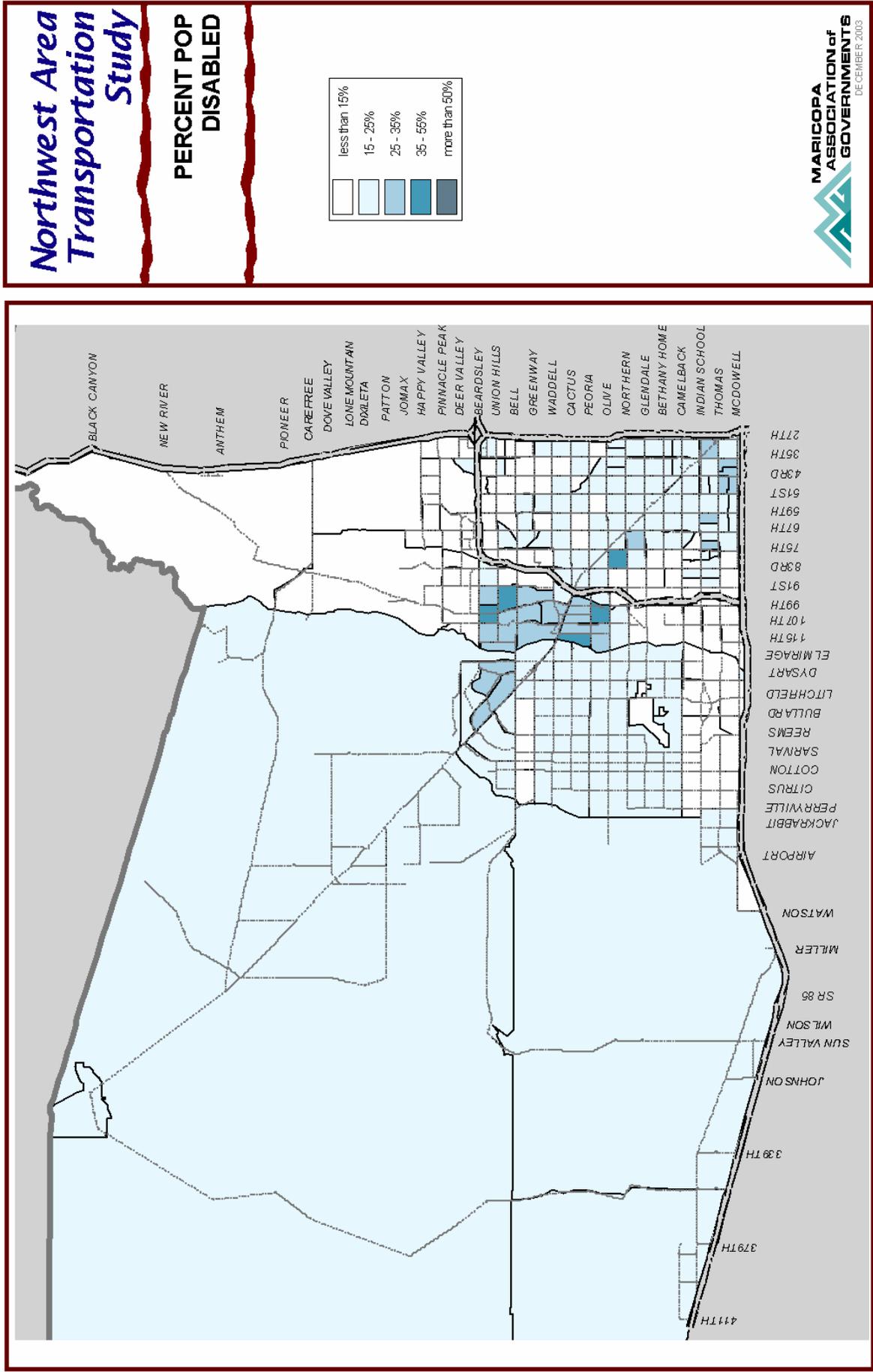


Figure 11: Percent Population Over Age 60

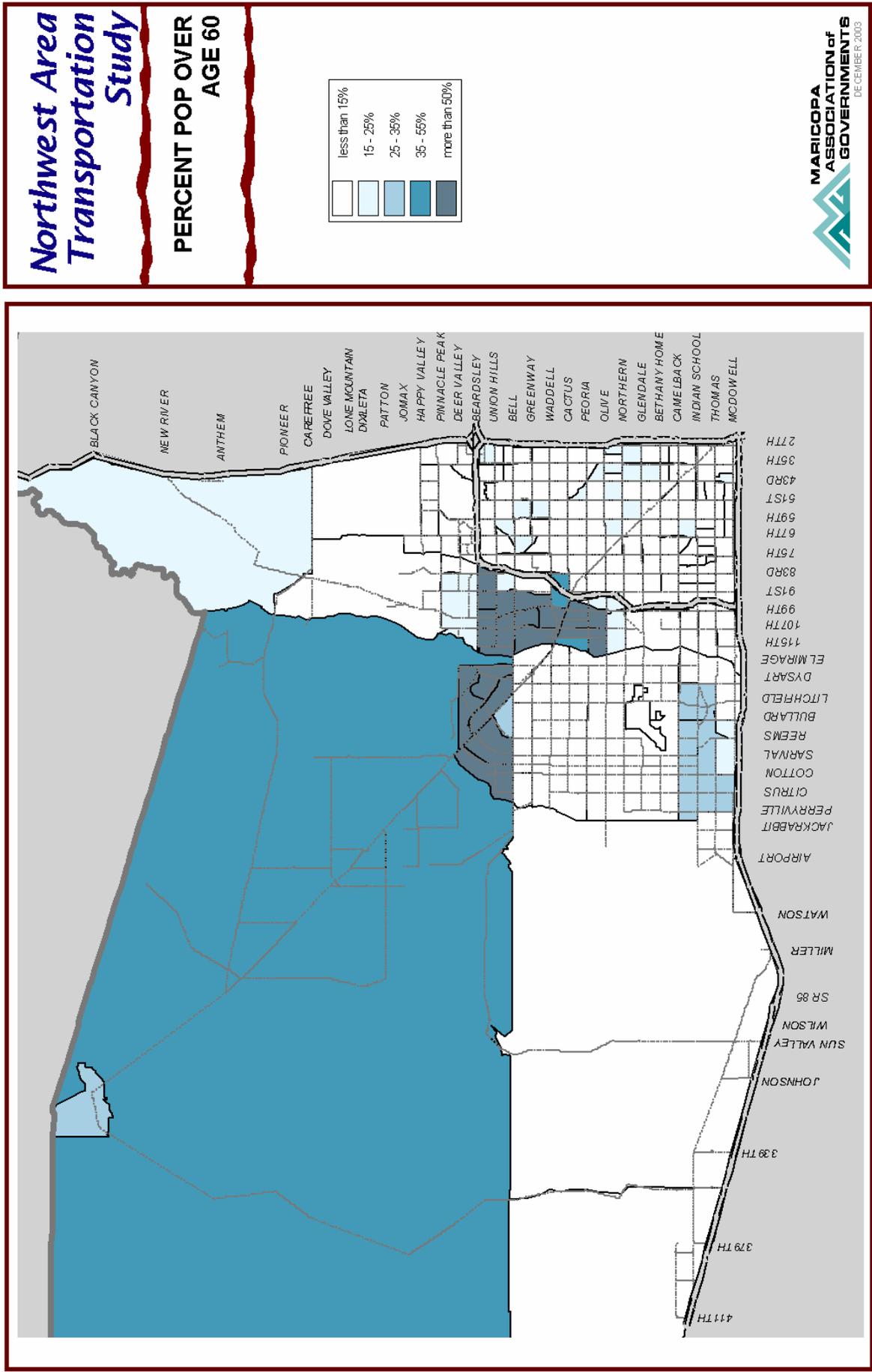
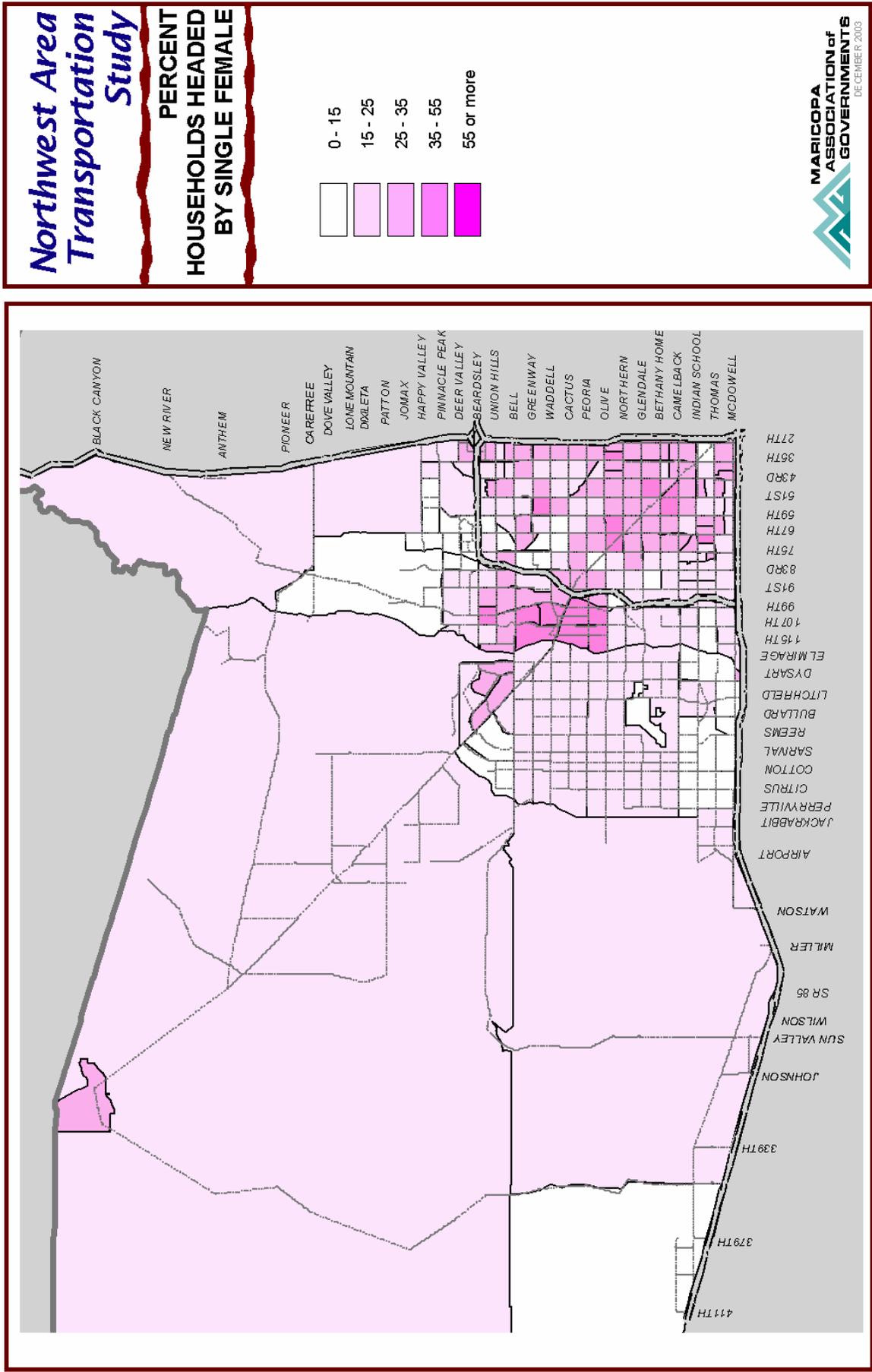


Figure 12: Percent Population Single Female Head of Household



5. Transportation Data

5.1 Existing Conditions

The Northwest Valley is served by a partial grid roadway system that connects the major activity centers with a hierarchy of roadways ranging from local streets in neighborhoods to limited access freeways for interregional travel (see Figure 13). The concept of the street network's grid roadway system is a series of north/south and east/west arterial roadways, which provide access to adjacent land uses, generally consistent traffic signal control, and a significant level of regional movement.

Though not complete, much of the existing street system layout is either in place or planned according to a grid concept. The main exception to the grid layout is Grand Avenue, one of the area's original roadways,

which runs northwest/southeast through the Valley. Grand Avenue is State Route 60 and the major surface roadway in the Northwest Valley. It provides a high level of access to area uses that have evolved along the roadway, but it also disrupts the grid traffic pattern. Among the impacts of Grand Avenue are the creation of complex six-legged intersections and truncation of local streets that reroute local traffic onto the arterial system for even very short trips.

Some additional characteristics that define the Northwest Valley Highway Network are shown in Table 11. These will be used as a basis for further analysis along with the anticipated land use changes to help establish network sizing goals for the area.

Figure 13: 2001 Highway Network

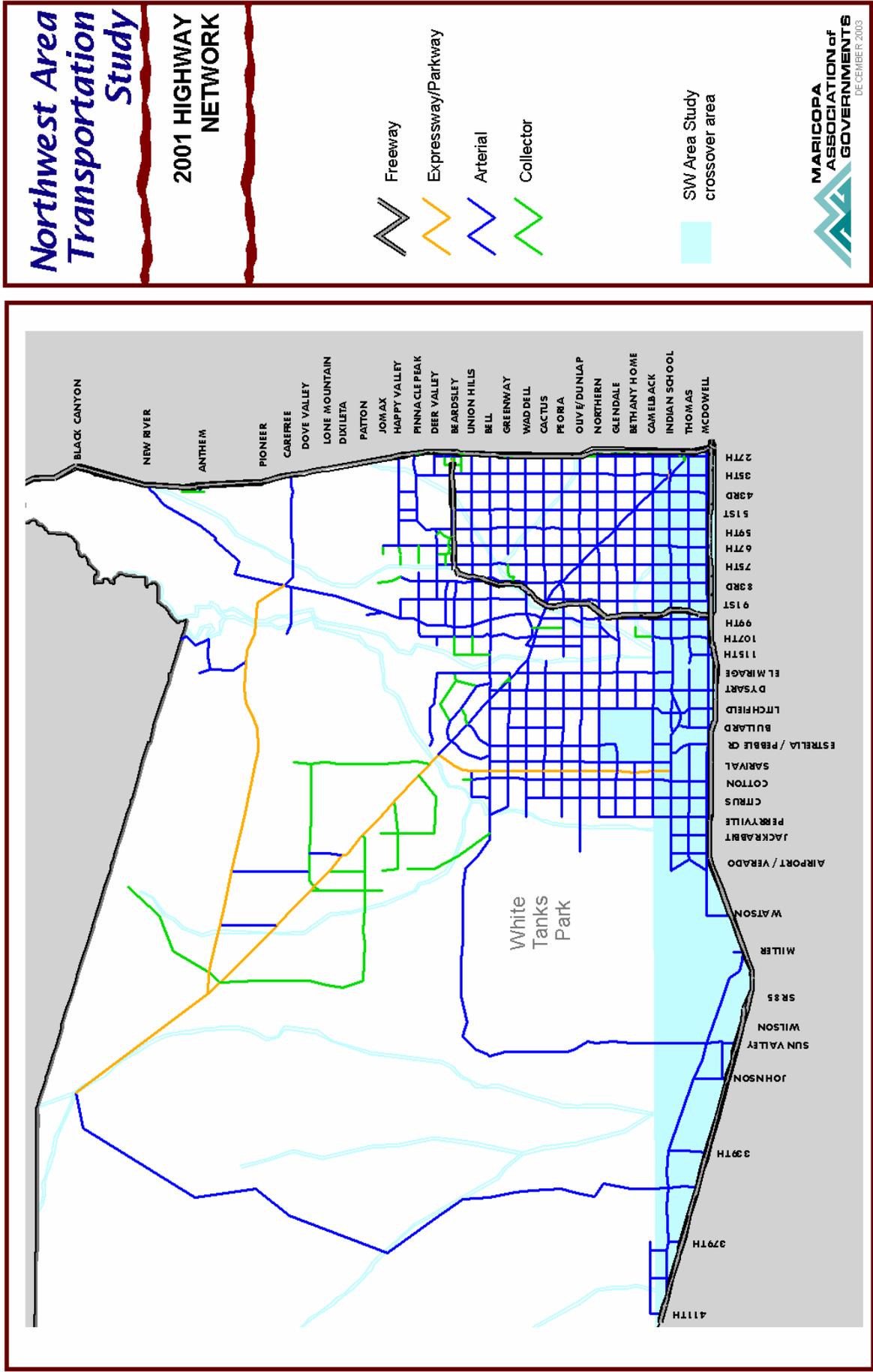


Table 11: 2001 Centerline Lane Miles and Lane Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	14	58	22	86
BUCKEYE	31	108	102	331
EL MIRAGE	17	44	17	44
GLENDALE	115	484	183	648
GOODYEAR	41	108	55	148
LITCHFIELD PARK	5	17	7	26
PEORIA	105	349	115	379
PHOENIX	193	854	253	1,104
SURPRISE	69	188	173	450
TOLLESON	1	5	4	27
WICKENBURG	4	14	14	58
YOUNGTOWN	0	1	1	4
MARIC CO	357	987	89	308
TOTAL	952	3,218	1,034	3,614
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeways			131	648
Expressways/Parkways			70	197
Collectors			138	294
Arterials			695	2,475
TOTAL			1,034	3,614

5.2 Discontinuities in the Street Network

A major challenge to providing reliable roadway transportation is the discontinuity and irregularity of portions of the arterial grid. Section line roadways are often interrupted by major developments or other installations that were in place long before the growth of the past 20 years. Where this occurs, parallel arterials are forced to carry higher loads and distort the balance within the network. This results in congestion and impacts to access and adjacent land uses. Table 12 lists significant manmade land uses within the Northwest Valley that cause interruptions to a consistent roadway network².

Table 12: Roadways Disrupted by Manmade Land Uses

Use	Roadway
Luke Air Force Base	Bullard Avenue Glendale Avenue Litchfield Road (occasionally)
Glendale Municipal Airport	Bethany Home Road 111 th Avenue 107 th Avenue
Sun City	Thunderbird Road Cactus Road 111 th Avenue
Sun City West	Sunrise Boulevard Reems Road Litchfield Road Dysart Road
Parkland or Canals	Greenway Road 111 th Avenue 115 th Avenue

Natural land formations also disrupt the street network's grid. Many river crossings become impassable during heavy flow periods, and in some locations, alternative crossings are not

² Tables 12 and 13 do not include breaks in roadways that cannot be definitively attributed to specific land uses or natural features.

available or are so far away that they are not feasible. This problem can be remedied by adding the necessary bridges, though there is a question about where they should be placed.

Other features (e.g., mountains, parks) are not as readily mitigated where roadways are viewed as incompatible with the vision for those areas. Table 13 presents significant natural conditions within the Northwest Valley that cause interruptions to a consistent roadway network.

Table 13: Roadways Disrupted by Natural Features

Feature	Roadway	
Agua Fria River	Happy Valley Road Beardsley Road Waddell Road Bethany Home Road	Thomas Road Peoria Avenue Thunderbird Road Deer Valley Drive
New River	Cactus Road Pinnacle Park Road	Beardsley Road Jomax Road
Skunk Creek	Greenway Road	
Trilby Wash and Basin	Dove Valley Road Beardsley Road	Union Hills Road Happy Trails Road
White Tank Mountains	Greenway Road Cactus Road Olive Avenue Glendale Avenue Camelback Road Thomas Road 247th Avenue	Waddell Road Peoria Avenue Northern Avenue Bethany Home Road Indian School Road McDowell Road Apache Road
Hieroglyphic Mountains	Dove Valley Road	

5.3 Variable Width Roadways

As the primary regional transportation network, the arterial roadway system crosses municipal boundaries and is therefore subject to the planning efforts of multiple localities. Municipal strategies and the variable pace of development have resulted in a network of shifting capacities and a “scalped streets” challenge. Depending on arterial and location, roadways can increase and decrease in capacity over relatively short distances. This sends confusing messages to

drivers about the intended use of each roadway as driving practices vary with roadway character. The scalped streets problem creates congestion where street cross-sections narrow. They also create a burden to other streets that compensate for substandard capacities in narrow or unfinished sections. In practical terms, varying roadway capacities result in reduced levels of service and decreased effectiveness for vehicular flows.

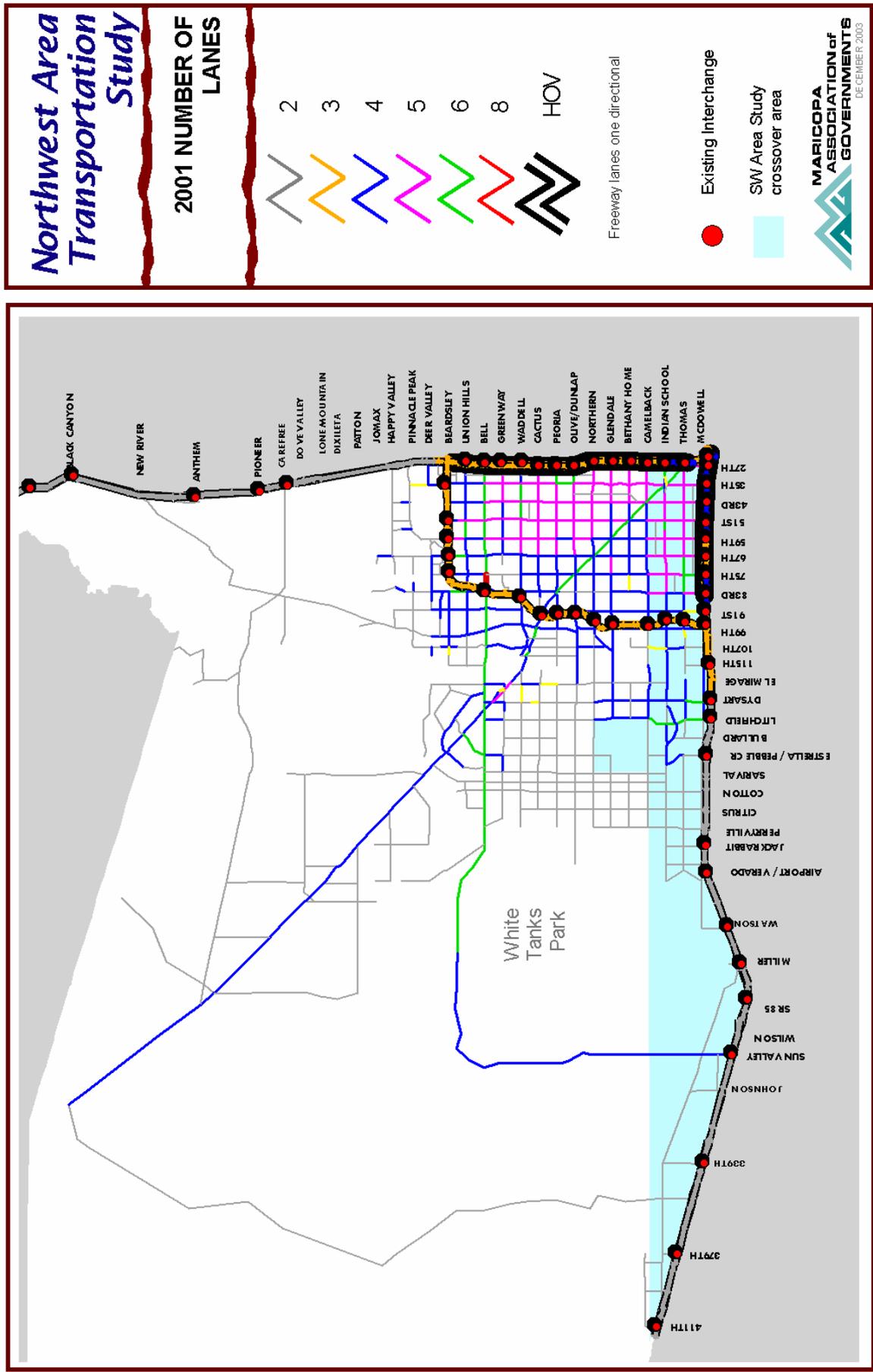
Table 14 presents existing roadways within the Northwest Valley with varying numbers of lanes, as indicated in current conditions or in the General Plan.

Table 14: Roadways with Varying Numbers of Lanes³

Roadway	Direction	Numbers of Lanes
59th Avenue	northbound	2-3
67th Avenue	north- and southbound	2-3
75th Avenue	north- and southbound	1-3
83rd Avenue	north- and southbound	1-3
91st Avenue	northbound	1-2
107th Avenue	north- and southbound	1-2
El Mirage Road	northbound	1-2
Dysart Road	north- and southbound	1-2
Union Hills Drive	east- and westbound	2-3
Greenway Road	east- and westbound	1-2
Northern Avenue	eastbound	2-3
Glendale Avenue	westbound	2-3

³ Table 14 does not include roadways that progressively widen and maintain their increased capacity; it only includes roadways that widen and narrow within relatively short distances as a result of their construction timing or disparities in the requirements imposed on adjacent properties.

Figure 14: 2001 Number of Lanes



Variable roadway conditions also result from constructing roadway segments at different times and for different purposes. Short-term planning for a low volume connector road through undeveloped land may be satisfactory to meet short term connectivity needs, but that same cross-section may be inadequate to meet demand based on future development. The result is usually segments with insufficient long-term capacity, leading to reduced efficiency for the entire roadway network.

Planning for vehicular volumes based upon regional traffic demand will be required in the future to reduce or eliminate these inefficiencies. As part of this task, the existing and planned roadway network will be modeled. Based upon model results, the extent of the constraints described above will be determined. Where necessary, physical and policy recommendations will be provided to help reduce the impacts upon the roadway and transportation network.

5.4 Capacity Limitations

Based on current volumes, the locations that experience recurring congestion are concentrated around the Grand Avenue Corridor, and I-17. During the peak periods of the day, they can reach level-of-service (LOS) E or F (see discussion of LOS in section 6) causing serious delays. The complexity of some intersections and the “shortcut” effect of the diagonal alignment of Grand Avenue through the Northwest Valley and the heavy concentration of land uses along the I-17 Corridor contribute to these being the most congested routes in the area. As a result, many of the intersecting arterials also suffer from over capacity conditions as they accept diverted traffic or feed the key roadways. In general, however, congestion is not widespread as yet in the Northwest Valley, though growth projections would indicate

major improvements will be needed to maintain adequate traffic flow as the area develops.

One of the primary concerns is the provision of sufficient capacity in the highway network to accommodate the expected growth. Loop 303, for example, though not yet funded, is being fully relied on by development for future transportation needs. ADOT expects that I-10 and I-17 will require substantially more capacity within the next 20 years to handle planned growth. Similar issues arise with key arterials such as Bell Road. Part of providing the needed capacity is to integrate the transportation plans of the growing communities so that they work in a cohesive fashion. This may require review of timing and funding to ensure that unnecessary congestion “hotspots” are not created as growth occurs.

5.5 Existing Traffic Volumes

Traffic count data are essential to the management of the local street system. This is true for local needs as well as regional objectives. Traffic volumes are not only an indication of demand, but can also show developing trouble spots and help shape strategic plans for improvements. In the Northwest Valley, not all communities collect traffic volumes on a regular basis. Phoenix, Glendale and Peoria have well-established data gathering practices, but other cities are still developing their controls. For those communities, the latest information is obtained from MAG, the County or ADOT, but is not collected as frequently as required to manage a growing system effectively.

Subject to the stated limitations, Figure 15 shows the latest traffic volumes in the Northwest Valley.

Figure 15: 2001 Traffic Volume Map

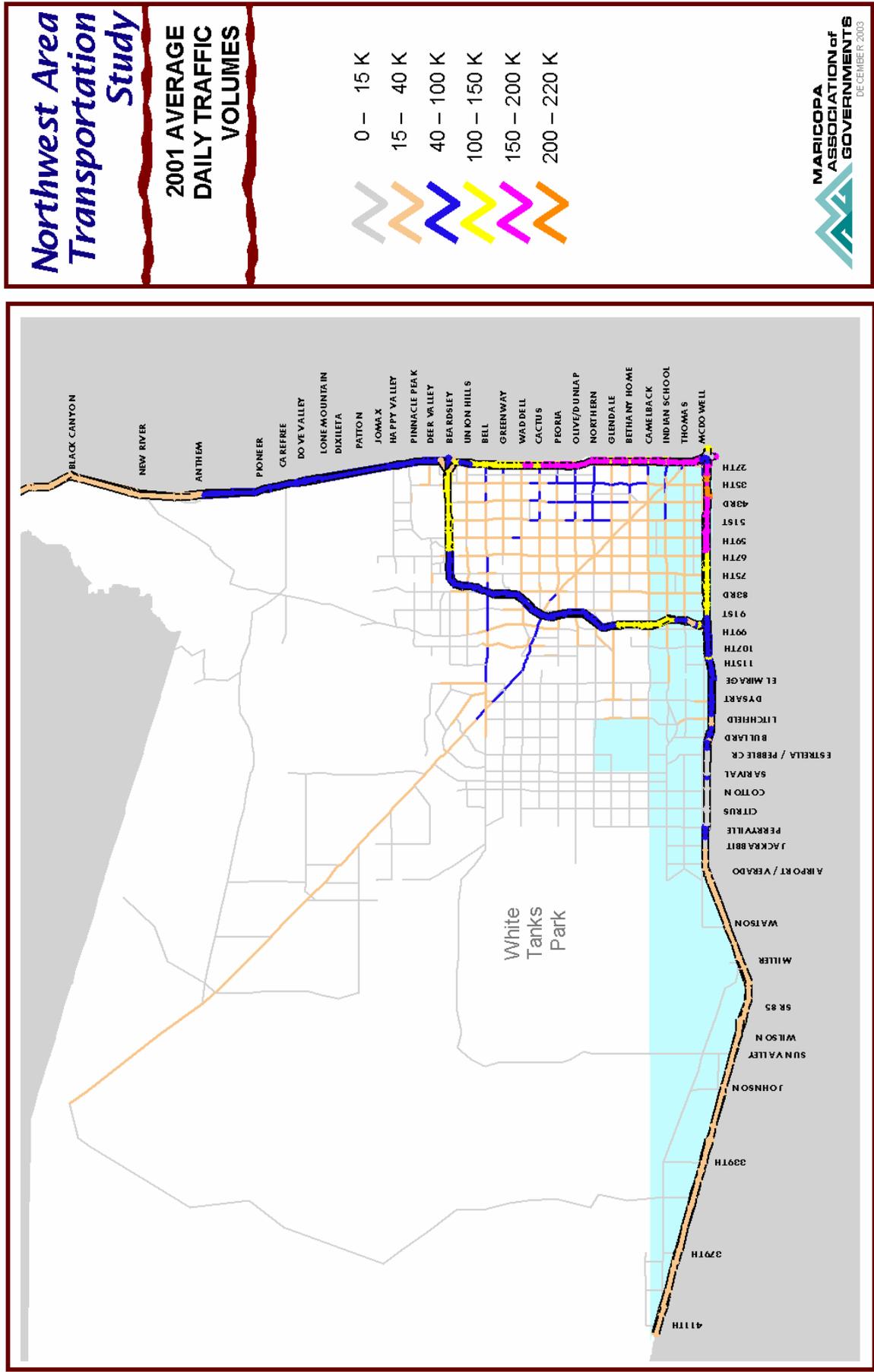
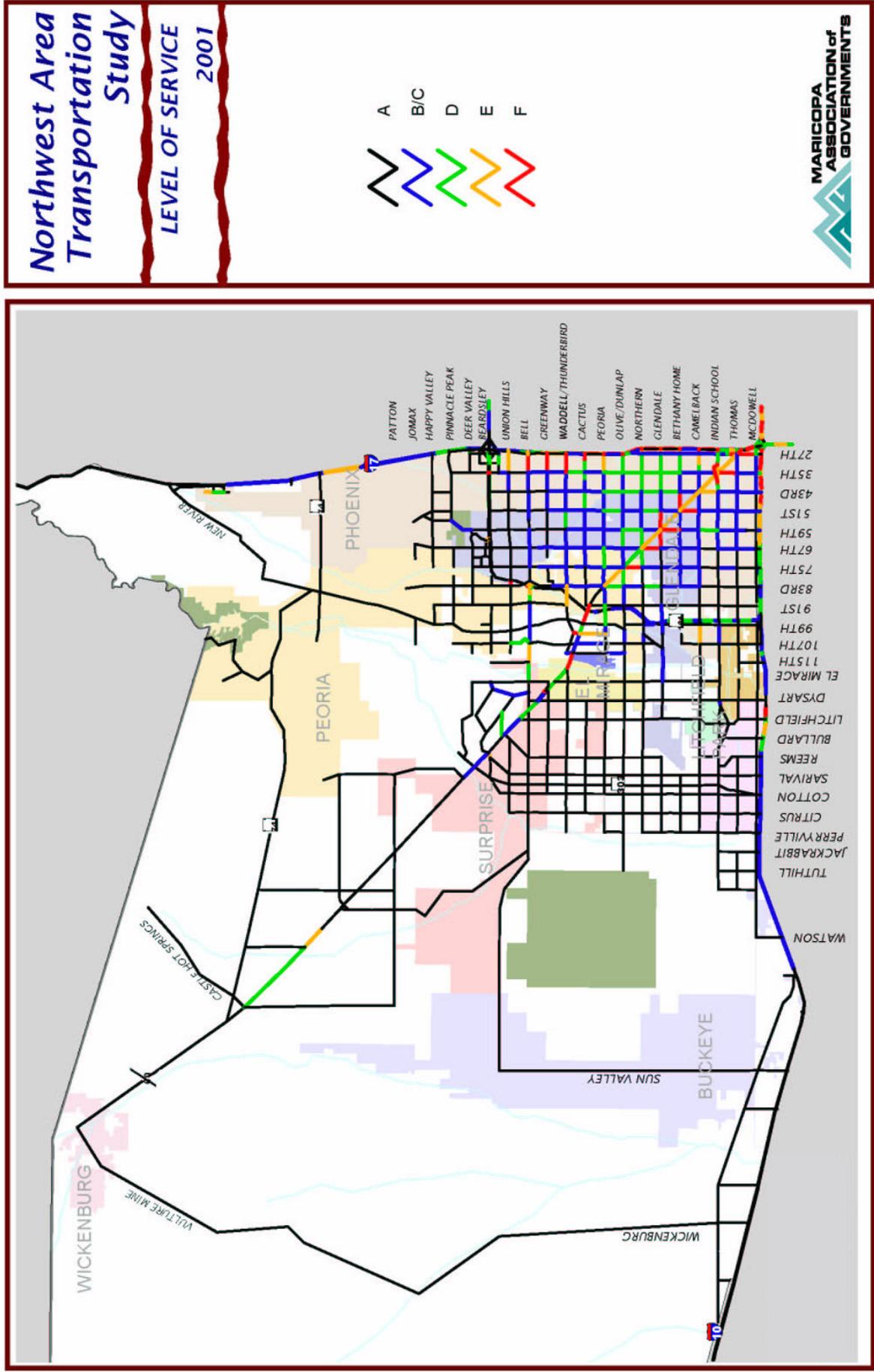


Figure 16: 2001 Average Daily LOS



5.6 Congestion

Based on current volumes, the locations that experience recurring congestion are concentrated around the Grand Avenue Corridor, and I-17. During the peak periods of the day, they can reach LOS E or F causing serious delays. The complexity of some intersections and the “shortcut” effect of the diagonal alignment of Grand Avenue through the Northwest Valley and the heavy concentration of land uses along the I-17 Corridor contribute to these being the most congested routes in the area. As a result, many of the intersecting arterials also suffer from over capacity conditions as they accept diverted traffic or feed the key roadways. In general, however, congestion is not widespread as yet in the Northwest Valley, though growth projections would indicate major improvements will be needed to maintain adequate traffic flow as the area develops.

5.7 Traffic Signal/Intelligent Transportation Systems

The traffic signal systems and coordination in the Northwest Valley are operated independently by each city. With the exception of Phoenix, there are no centralized signal control systems in the area. However, Glendale, Peoria and Surprise are planning to implement such systems in the near future. This will lead to greater opportunities for area wide implementation of signal coordination in the near future. Consistent with the MAG ITS Strategic Plan, Phoenix, Peoria, Surprise, and Glendale are part of the regional ITS program that encourages signal coordination across jurisdictional boundaries. These agencies will soon have the ability to provide traffic-related information to the regional traffic operations center at ADOT that could be shared with other neighboring cities and the State for incident identification/response and the

prospect of interjurisdictional coordination of signals.

Phoenix operates a Series-2000 central controller that handles most of the approximately 800 signals within its corporate limits. Interconnection between signals is via a combination of twisted pair cable and telephone lines, largely based on the date of the installation, but it offers a level of control that exceeds what is available in the rest of the area. Most of the intersection controllers are compatible (or soon will be) with present and future objectives of the Phoenix signal coordination and priority plans. Additional improvements will be made to accommodate light rail transit requirements when LRT begins service in 2006.

Glendale has about 150 traffic signals and an extensive plan for ITS improvements. Trunkline conduit runs have been identified (some are partially in place) that will support the overall plan for signal coordination as well as many other program elements such as closed circuit television cameras (CCTV) at key locations. Glendale currently uses a Transit 1810EL control system with PEAK intersection controllers, but plans to upgrade the central controller to an ICONS system in the near future. The new system will expand the city’s capabilities to allow transit priority treatments and a higher level of traffic signal coordination. It will be co-located with the city’s emergency services to make the system data available to police and fire departments and allow better responses to emergency calls. There has been little interaction to date with adjacent communities in sharing system capabilities. Once the necessary conduit is installed Glendale will share their signal control data with ADOT and other agencies as called for in the regional ITS Strategic Plan.

Peoria has a long-term plan to install fiber-optic cable and the necessary equipment to manage and coordinate signals. For now, Peoria has coordination at a few locations, which have been developed with ADOT and Maricopa County, and is preparing plans to institute time-based coordination along additional critical arterials. Peoria has had preliminary conversations with the City of Phoenix about a cooperative signal control arrangement using Phoenix equipment, but no plans or timetable for such action are defined.

Surprise, Buckeye, El Mirage and Youngtown and Wickenburg do not have central control systems or coordination on local streets yet, but could avail themselves of opportunities to connect to a neighboring system in Phoenix, Glendale or Maricopa County if capacity is available. This would allow the signals to be managed as part of a larger arterial network and offer the possibility of interjurisdictional signal coordination. This type of arrangement requires careful consideration of liability and operating practices by both signatory entities, but can serve as a good temporary operation while plans for permanent systems are developed.

5.8 Future Highway System Characteristics

Based on the anticipated changes in the General Plans of the NWATS communities, the highway system will grow substantially over the next 20 or so years (See Figure 17).

While some improvements are to be made in the already urbanized area (e.g., Glendale and Phoenix programs), most of the changes can be expected to take place in the outlying growth areas of each city. Peoria, Surprise and Buckeye in particular have ambitious plans to expand roadways into new areas as development activity moves north and west.

One of the primary concerns is the provision of sufficient capacity in the highway network to accommodate the expected growth. Loop 303, for example, though not yet funded, is being fully relied on by development for future transportation needs. ADOT expects that I-10 and I-17 will require substantially more capacity within the next 20 years to handle planned growth. Similar issues arise with key arterials such as Bell Road. Part of providing the needed capacity is to integrate the transportation plans of the growing communities so that they work in a cohesive fashion. This may require review of timing and funding to ensure that unnecessary congestion “hotspots” are not created as growth occurs.

Table 15 shows the proposed number of lanes planned for major facilities in the Northwest Valley based on the General Plans of the individual communities. These plans form the foundation of the future roadway network. When combined with future land use changes in the travel demand model, they will provide an indication of where the congestion points are likely to occur as the area evolves. As indicated, most new roadways are assumed to be built with four lanes. This also occurs in areas that are planned for substantial growth, well beyond the ability of a four-lane road to handle. As development proceeds in these areas, it will be essential to devise lane configurations that support the proposed land uses. Furthermore, they must be reflected in the stipulations for such projects to avoid built-in deficiencies in city plans.

There is a large increase in available highway capacity, but it only keeps pace with population and employment over the next 20 – 25 years. The rate of increase in highway capacity slows after that, while population and employment continue to grow. Many collectors in 2000 are forecast to become

arterials by 2020 to offset the increase in demand in the area. At the same time, there is only a modest change in freeway lanes

miles, which ADOT has identified as critical to maintaining traffic flow in the Northwest Valley.

Table 15: 2020 Centerline Lane Miles and Lane Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	19	86	25	117
BUCKEYE	142	539	406	1,569
EL MIRAGE	21	102	21	102
GLENDALE	129	609	202	923
GOODYEAR	47	197	60	261
LITCHFIELD PARK	5	25	7	34
PEORIA	165	703	195	854
PHOENIX	271	1,251	325	1,614
SURPRISE	88	381	258	1,080
TOLLESON	1	6	4	24
WICKENBURG	4	14	14	58
YOUNGTOWN	0	1	1	6
MARIC CO	706	2,629	97	417
TOTAL	1,598	6,543	1,614	7,060
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeways			136	1,064
Expressways/Parkways			82	317
Collectors			88	242
Arterials			1,308	5,437
TOTAL			1,614	7,060

Figure 17: Future Base Roadway Network

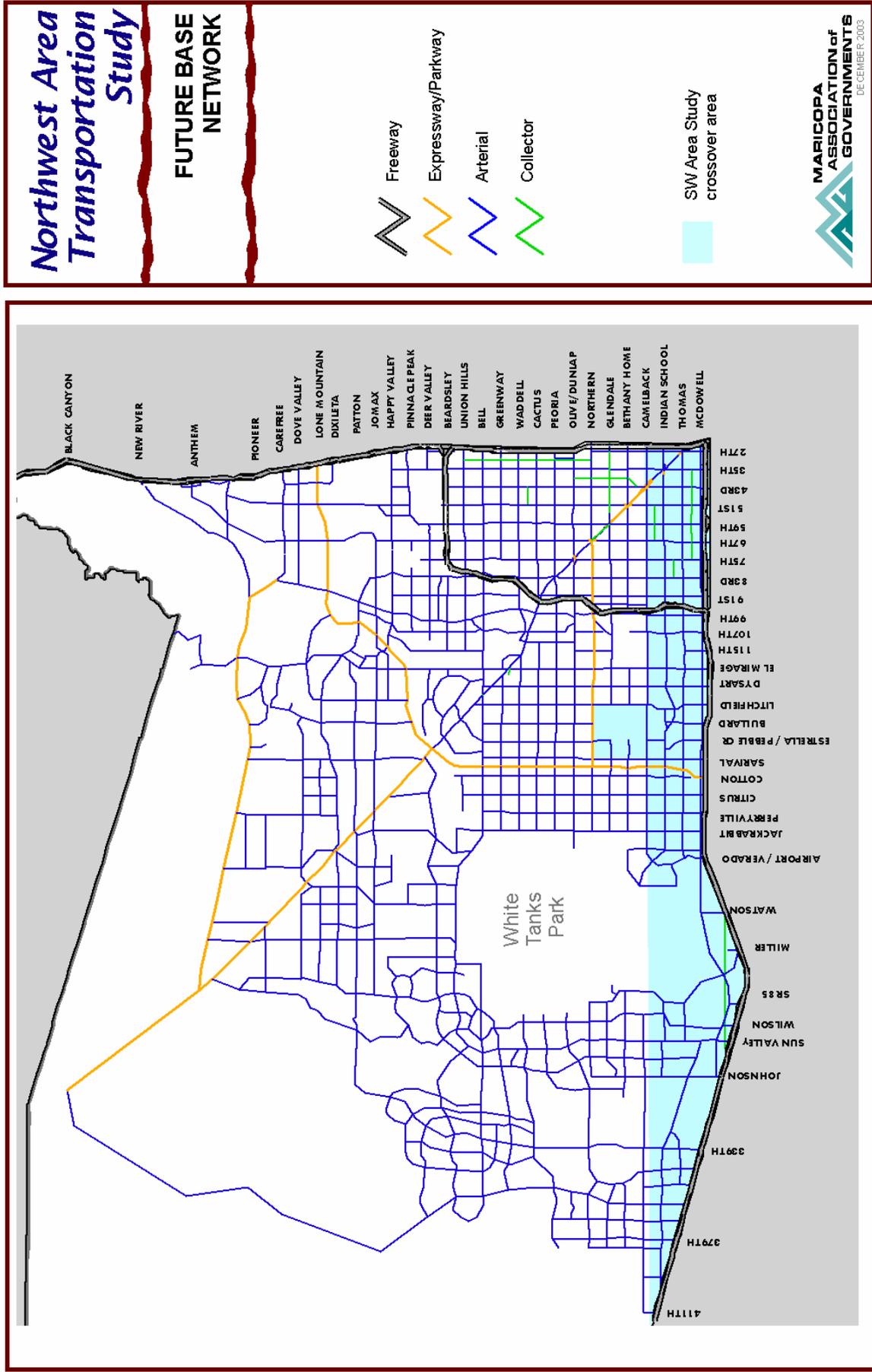
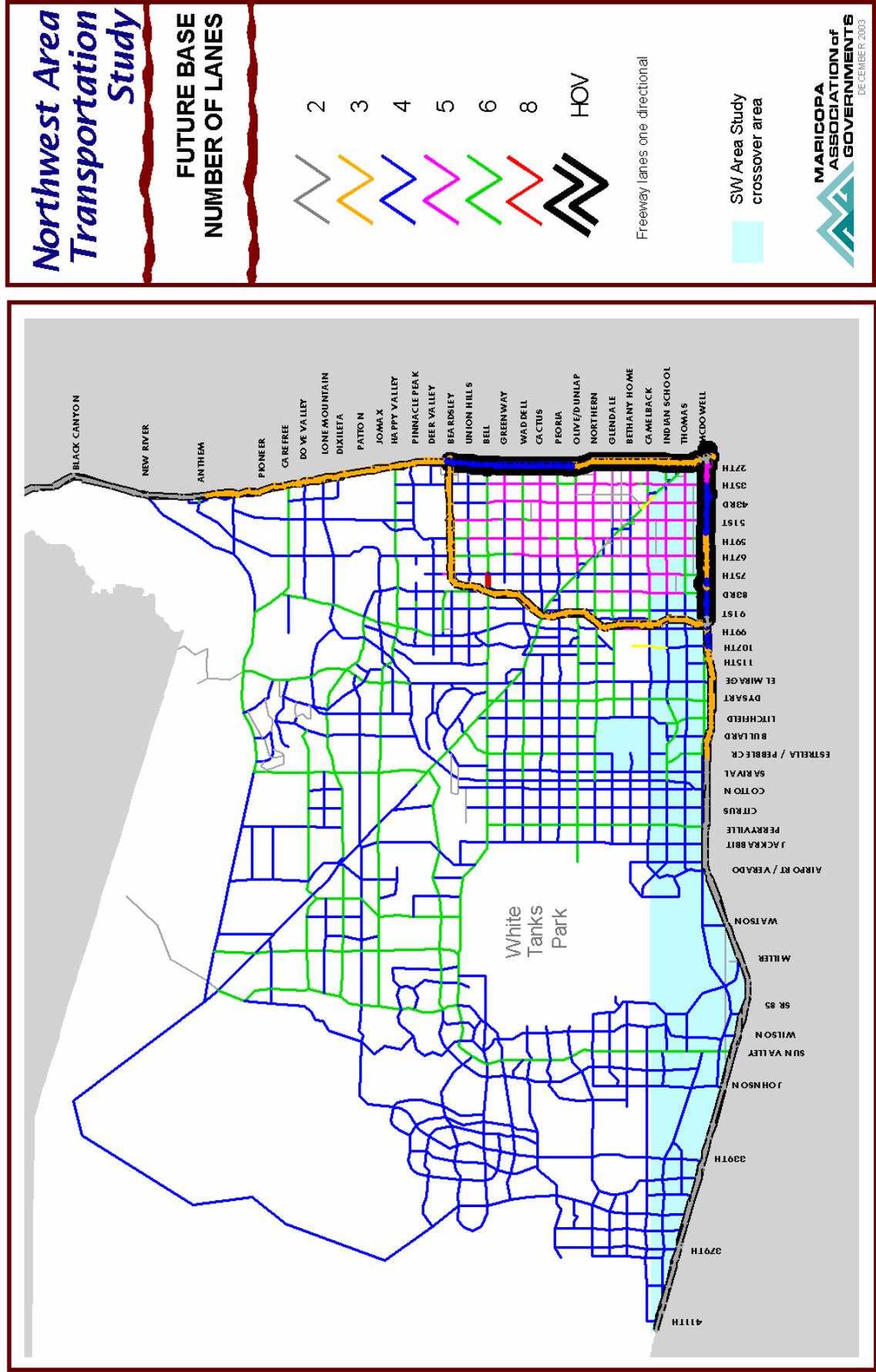


Figure 18: Future Base Number of Lanes



5.9 Transit System

5.9.1 System Characteristics

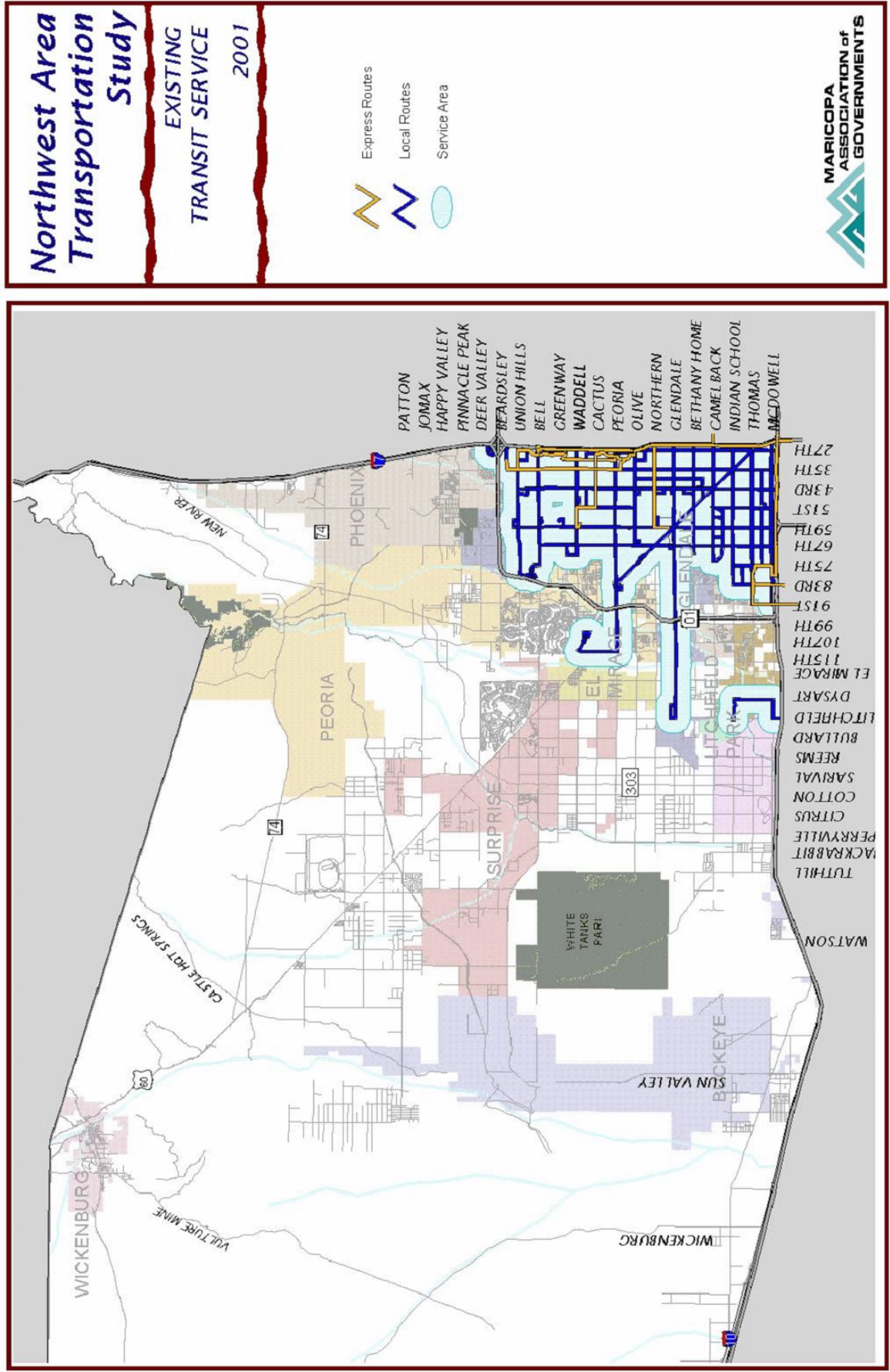
Historically, land throughout the Northwest Valley has developed as low-density residential, without much regional coordination of circulation plans. Transportation improvements have followed this land use pattern, with roadways built to provide access between existing communities and newly developed parcels. The correlation of low-density, roadway-focused transportation has resulted in traditional suburban growth throughout the Northwest Valley, which limits opportunities for transit to offer a viable alternative to automobile-dependent households. Despite policies that support a multimodal approach, without minimum corridor level population or employment densities and coordinated land use planning across municipal boundaries, transit has not been a competitive transportation option in the Northwest Valley.

Phoenix has a well-developed transit program with a growing bus system and a light rail transit line under development. Glendale has just begun to improve its own services with the recently approved sales tax and will look at light rail in the future. El Mirage, Peoria, and Surprise have little transit available, but are beginning to identify their own opportunities to expand service in dial-a-ride and support further fixed route service into their communities. Wickenburg has indicated interest in a local circulator type of service as well as the need for better line haul connections such as commuter rail to the Phoenix area. In summary, despite the limitations of existing land use patterns, there is a growing interest in providing alternatives to a “car-only” transportation system.

There are currently only two park-and-ride lots available for Northwest Valley bus or carpool riders. As an aid to transit and ridesharing, the MAG Park and Ride Study identified eight additional park-and-ride locations in the Northwest Valley. They vary in size from fewer than 300 to 800 spaces. They primarily serve opportunities along the freeway system, but could provide access to a high capacity transit system or even local fixed route service if designed with those technologies in mind. Individual cities have also begun to define locations for possible park-and-rides that would enhance their own access to transit systems over time.

Still, there is limited transit service available in the Northwest Valley (See Figure 19). RPTA offers only a few lines to the western boundaries of Glendale and Phoenix. Generally, they turn around at the boundary requiring users from farther west (e.g., Surprise, El Mirage) to travel to the eastern city limit to avail themselves of the bus system. Extensions to the west will require financial contributions from the communities benefiting from the service. Those conversations have been underway in the cities of Peoria and Surprise, but the limited funding available has been a significant impediment to the establishment of consistent ongoing service. Instead, Peoria and Surprise have decided to build toward a better transit plan by focusing efforts on improving paratransit services and moving toward fixed route service as funding becomes available. Much of the success of this approach hinges on the availability of regional funding for transit.

Figure 19: Existing Transit System Map



5.9.2 Long Term Plan 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 BNSF Railroad right-of-way because the corridor is already well defined. Even outlying communities such as Wickenburg view commuter rail as an opportunity for their residents to access urban core destinations in the more established areas of the Valley. BNSF has also shown a willingness to discuss the prospects of passenger service as they consider ways to make their own operations more efficient through possible relocations of yards and services.

Light rail transit (LRT) is under development in Phoenix and will be evaluated soon in Glendale. While this technology has limited application at this stage in the evolution of the Northwest area, the first vestiges of the system could be expanded to offer significant additional capacity to other communities at a later time. The LRT could also help to shape future growth by helping to create basic residential and/or employment densities where they would otherwise not likely develop.

Bus rapid transit (BRT) is another technology that is being developed in the City of Phoenix, but which may offer opportunities throughout the Northwest Valley (and the entire region)

for line haul transit service. BRT in the Northwest Valley could take advantage of the existing and planned freeway system or even major arterials and attract riders from even low-density developments if designed with the full complement of the features being made available in other cities such as Los Angeles and Pittsburgh.

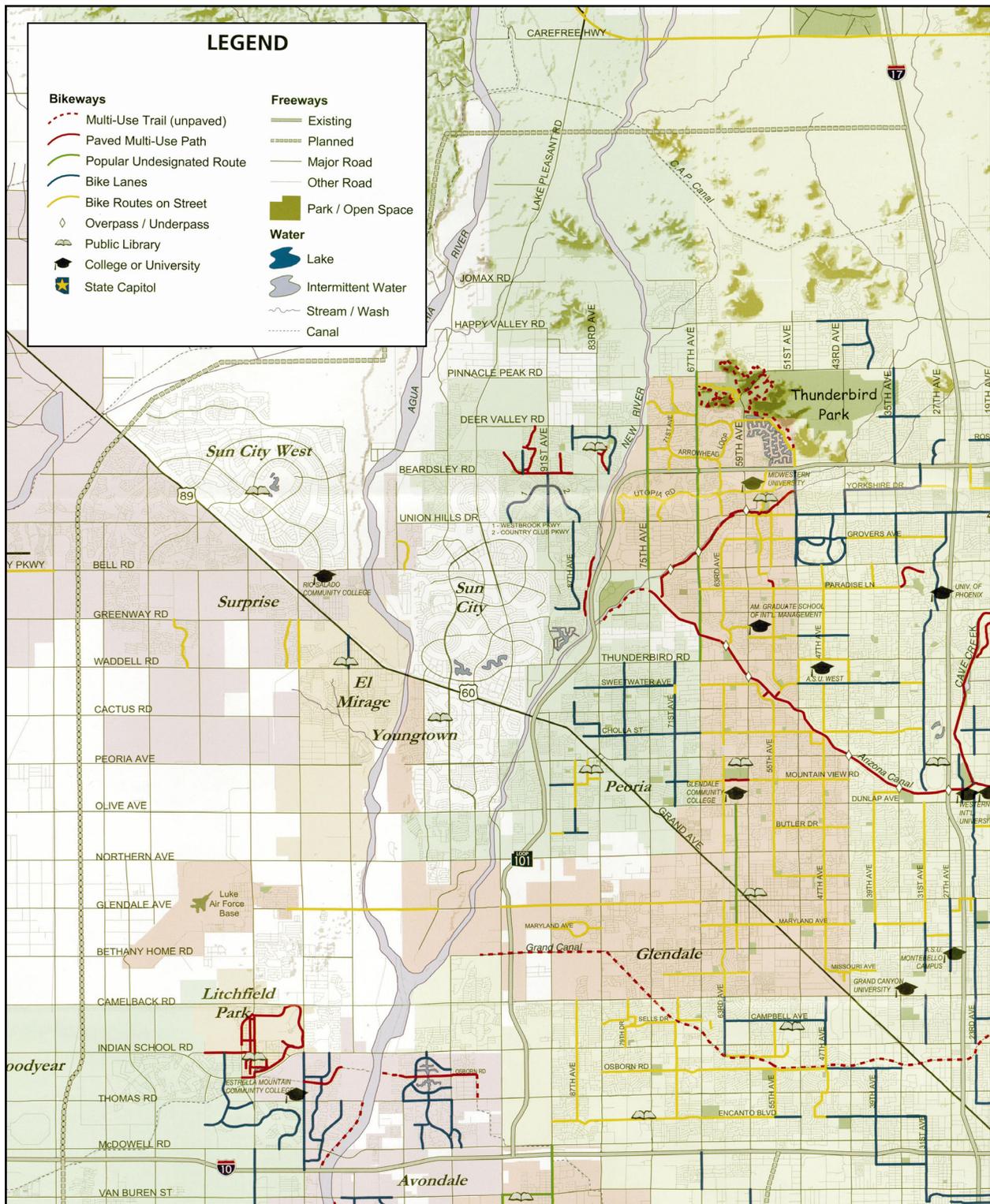
5.10 Bicycle/Pedestrian System

5.10.1 System Characteristics

While most communities within the Northwest Valley have included bicycle and pedestrian elements within their master plans, most efforts related to these elements are focused around recreation or as an element of roadway development. There is a general reluctance to view bicycles, for example, as offering mobility the way a car does. In addition to the local climate, the character of development with generally long travel distances discourages reliance on bicycles as a primary mode.

The complexity of the issue of integrating a system of bicycle paths and pedestrian amenities across jurisdictional lines rises as discontinuities multiply. The same factors, which limit the effectiveness of the arterial grid (discussed above), challenge a feasible regional bike lane or bike route plan to aid commuters. In the absence of a common understanding of how to implement the plan, it will remain a recreational amenity.

Figure 20: Existing Bicycle and Multi-Use Facilities



Source: Bikeways Metropolitan Phoenix Area, Maricopa Association of Governments, 2003

5.11 Long Term Plan for Non-Motorized Elements

5.11.1 Bicycle Plan

Regional bicycle system components that span significant lengths of the Northwest Valley have been generally confined to readily identifiable, defined rights-of-way such as riverbeds, utility easements, railroad corridors, parks and some roadways. The MAG Bicycle Plan vision extends as far west as Vulture Mine Road and north to Lake Pleasant as part of a regional Northwest Valley bicycle system. The New River and Agua Fria River Corridors are among the most visible elements of the West Valley Rivers Master Plan and contain major bicycle components. Beyond such identified corridors, most of the future bicycle system is oriented toward new development areas, many of which are to the northwest of the current urban core.

Glendale, Peoria, Phoenix and Surprise have their own plans for bicycle system development. El Mirage has a longstanding policy, but no specific plan. Maricopa County has identified an extensive countywide system in their long-range plan. Most of the city systems are located within roadway rights-of-way in existing areas and expand to include off-road trails and special facilities as they move toward developing areas. While many of these are designed to connect city activity centers, some offer regional benefit in that they provide a local linkage between regional trails (e.g., the rivers) and major activity centers. The county's plan emphasizes continuity more than connectivity as it attempts to link regions beyond activity centers.

5.11.2 Pedestrian Plan

The majority of the pedestrian plan elements in the Northwest Valley are implemented as part of the expansion of the highway system.

As roadways are constructed, sidewalks are included to afford pedestrians circulation between key destinations and access to various land uses. Specifically designed pedestrian facilities are primarily part of multipurpose trails systems and usually share space with bicyclists and other path users. On the other hand, there is a growing recognition that the quality of the pedestrian environment is a primary consideration in an individual's choice to walk and even to use transit. The MAG Pedestrian Guidelines provide for an accommodation of pedestrians in a way that makes the use of sidewalks and walkways a better complement to other forms of transportation.

5.11.3 Golf Carts and Other Modes

There is little use of golf carts on public streets except in the Sun City communities where their use inside the community boundaries is prevalent. Within the Sun Cities, special provisions to safeguard golf cart use have been made in the street right-of-way through specialized striping and signage. There are no organized systems and none is currently planned outside the Sun Cities. Recent announcements regarding a possible new age-restricted community in Buckeye could call for application of the Sun City criteria for golf cart usage.

5.12 Goods Movement/ Intermodal

The section of I-10 leading west from Central Phoenix is home to multiple distribution centers. These operations rely prominently on trucks for collection and distribution of goods throughout the Valley and to other regions in the Southwest and the Nation. While there is no designated truck route system in most of the Northwest Valley, most truck traffic uses the existing freeway system (i.e., I-10, I-17, Loop 101) or Grand Avenue. Still, there is measurable growth in the use of existing Loop

303 even before it is constructed to its ultimate standards. This raises the prospect of how to best serve interregional truck traffic in the future given the concerns about truck operations along Loop 303 in some areas.

The Burlington Northern-Santa Fe Railroad (BNSF) mainline is adjacent and parallel to Grand Avenue in the Northwest Valley. The line carries about eight trains each day and serves a number of longstanding customers of the railroad along Grand Avenue. The Grand Avenue route is critical to BNSF operations, but the railroad is willing to discuss freight schedule adjustments to allow a broader use of the corridor (e.g., commuter rail) as well as expedite freight activities through the area. This could help reduce the demand for the use of the track in freight operation during peak commuter periods, and the conflict with passenger service. It would also simplify discussions about sharing. Some of the key facilities such as the automobile loading/unloading yard near Thunderbird Road in El Mirage would need to be considered in plans for a relocation of mainline services.

5.13 Safety

On average, Arizona has a higher crash rate than the nation as a whole. In 2002, the U.S nationwide accident rate was 1.51 per 100 million vehicle miles of travel. Arizona's rate was 2.09 for the same period. In 2002, there were a total of 9,543 crashes in the Northwest Valley, or 11% of the total of 87,606 crashes for the County. This compares to a population in the Northwest Valley that was 28% of the total for the County in 2000. One possible explanation for the lower number of accidents in the Northwest Valley compared to the County is that there is less overall travel per resident in the Northwest Valley relative to Phoenix and the rest of the region. The construction of additional freeway mileage and

the expansion of ITS improvements should help minimize the number of crashes in the Northwest Valley in the future, as some of the traffic that otherwise would travel on arterials will move to the new and improved freeways that provide relatively higher levels of safety. Based on the 2000 ADOT Motor Vehicle Crash Facts Report, Maricopa County had 86,688 reported crashes in the year 2000. Of those, 394 crashes included fatalities, 31,837 resulted in injuries and 54,457 were reported as property damage only (PDO).

Jurisdictions in the Northwest Valley reported the figures shown in Table 16.

Table 16: Accident Summary by Jurisdiction⁴

City/Town	Total	Fatal	Injury	PDO
Buckeye	6	2	1	3
El Mirage	114	3	47	64
Glendale	4997	27	1702	3268
Peoria	1554	1	517	1036
Surprise	244	3	90	151
Wickenburg	97	2	21	74
Avondale	473	0	128	345
Goodyear	249	4	89	156
Litchfield Park	-	-	-	-
Totals	7734	42	2595	5097

The City of Glendale maintains a list of high accident locations to monitor trends at intersections or segments that require special attention. Many of the critical locations have been identified for improvements in the Glendale Transportation Plan approved by voters in November 2001. Other communities rely on compiled information from ADOT to address their own needs, but face limitations regarding corrective actions without additional funding.

⁴ Figures for Avondale, Buckeye, Goodyear and Litchfield Park reflect the entire community and do not distinguish between NWATS and SWATS.

5.14 Transportation Plans and Policies

As discussed above, transportation elements throughout the Northwest Valley have developed at varying paces. Automobile travel has been the favored mode, with transit being planned and implemented on a smaller scale. Bicycle and pedestrian access as a regional transportation option has been limited.

Recent planning efforts include all these elements, but the combination has been shifting toward a strategy of providing a multimodal transportation network. A review of the Circulation Element of General Plans throughout the Northwest Valley indicates that while roadway infrastructure will continue to be the most prevalent transportation feature, additional options will also be needed in the future.

General Plans provide comprehensive direction for growth, conservation, and redevelopment of all physical aspects of a city through goals, policies and recommendations. The Circulation element is a guide for the development of transportation policy. Current conditions and future prospects are addressed with plans for each locality's modal options.

All the General Plans reviewed establish the maintenance and expansion of arterial roadway capacity as a goal to serve the community. Specific recommendations vary from encouraging convenient arterial access (El Mirage), completion of the grid system (Surprise), increased capacity of major streets and freeways (Phoenix), and requiring donation of rights-of-way for major arterials (Buckeye). These objectives demonstrate that providing auto access is a critical element

to transportation planning in the Northwest Valley.

The General Plans for Phoenix, Glendale, Surprise, and El Mirage also state recommendations to support alternative modes to automobile travel. Specific goals include:

- Expanding bus service, constructing high occupancy vehicle lanes, and building light rail transit (Phoenix);
- Providing options to travel by automobile (Glendale);
- Encouraging the use of transit and alternative modes of transportation (Surprise);
- Encouraging public transit opportunities and routes (El Mirage).

The General Plans of Phoenix, Peoria, Surprise, Wickenburg, and El Mirage include goals related to the development of bicycle or pedestrian facilities. These goals indicate a new objective of providing options to single-occupancy vehicular travel.

In addition to the stated objectives of the plan, policy support to help reduce or eliminate scalloped streets between adjacent communities is not visible. By the same token, there is little in each General Plan that relates to other policy needs (e.g., river crossings, transit service extensions, etc.) to improve the regional connectivity of each individual community's plans with adjacent cities. This is an area where a joint formulation of policy could help to manage growth to minimize impacts across city boundaries and within cities on undersized facilities.

6. Transportation Issues

Through consultation with the public and agency and private stakeholders, review of previous studies in the area, and technical analyses, key transportation issues have been identified in the Northwest Valley. Many are longstanding concerns and continue to surface in studies performed at the regional and local levels. Others are less visible, but just as significant as they relate to the long-term viability of the overall system. This section addresses the critical regional transportation issues in the Northwest Valley, combining local and regional input to create a broad understanding of what will be needed to maintain an acceptable level of service in the area.

6.1 Highest Priority Issues

Among the major issue categories are those listed below. Most are well defined and generally rise to the top of transportation discussions within the local communities. This is a generalized list of issue categories. The results of the public consultation phase that follow address more of the individual perceptions among the affected communities.

6.1.1 Key Issues in Northwest Valley

Highway

- Complete/maintain arterial grid
- River crossings
- East-west capacity

- System of Enhanced Arterials
- Grand Avenue
- Existing and New Freeway capacity/access
- Loop 303 (alignment, northern terminus, character and impacts)
- Wickenburg Bypass

Goods Movement

- Truck traffic (routes and impacts)
- Rail (BNSF)

Policy

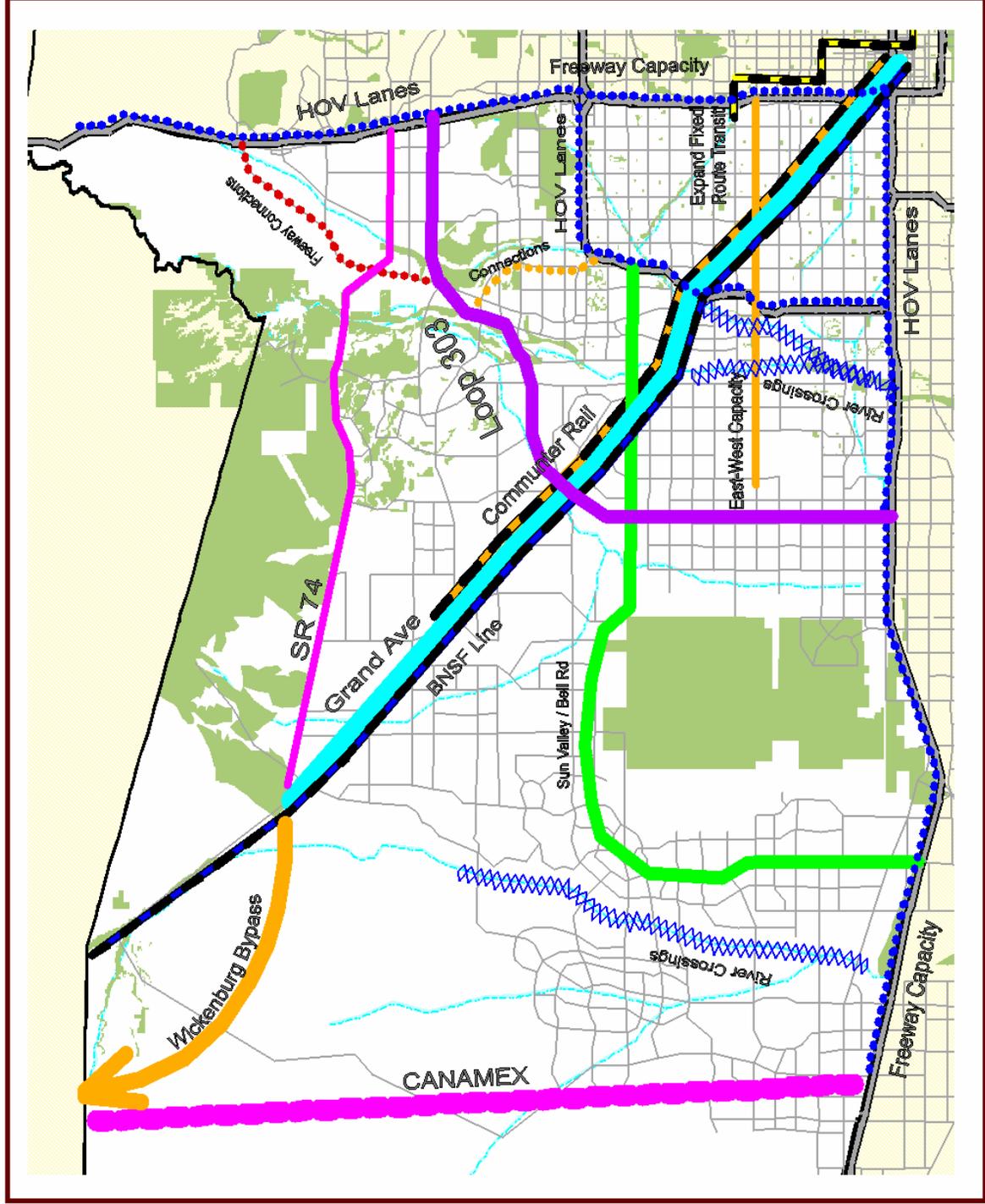
- Right-of-way protection
- Eliminating scalloped streets
- Maintenance of freeways

Transit / Alternative Modes

- Regional funding of transit service
- HOV lanes on 101, I-17 and I-10
- Commuter rail/high capacity transit
- Expansion of fixed route, dial-a-ride, etc.

Consistent with the strong automobile orientation of growth in the Valley as a whole, the Northwest Valley has a focus on improving key roadways. The vast majority of projects that are considered critical pertain to better management of traffic on streets and highways. Transit represents a smaller, but rapidly-growing interest in the more mature portions of the area. Figure 21 shows the location of critical issues.

Figure 21: Critical Issues Map



Northwest Area Transportation Study

CRITICAL ISSUES

6.1.2 Consultation Findings of Key Issues

Based on discussions with the local communities and interests, the following issues were the highest priority. It is clear that each community has its own priorities as they relate to their local area and the Northwest Valley subregion. For purposes of presentation, it is necessary to focus first on those items that are of concern to the greatest number of communities and interests. Other issues (and their solutions) will be used to refine the list of proposed solutions, as appropriate.

The high priority list is shown below. It covers a wide variety of items in all modal areas. They are shown in alphabetical order without specific indication of ranking⁵:

- Elderly Mobility
- Funding Transit Expansion
- Luke Air Force Base (AFB)
- Existing and New Freeway Capacity/Access
- Freeway Funding
- Upgrade Railroad Crossings
- Right-of-way Preservation in Transportation Corridors
- Signal Coordination/Intelligent Transportation Systems (ITS)

⁵ A broad issue will garner stronger support because it touches more directly on most agencies and their constituents (e.g., elderly mobility). Those that impact one area more than another may not show the same regional support (e.g., golf carts.) With this understanding, the ranking is shown only as a relative measure of importance for items that meet a specific interest or focus on a specific concern of the community representatives interviewed in the Consultation and Coordination Tasks or which rise to a level of concern based on empirical information about system performance.

6.1.3 Modal Breakdown

Because this is a disparate collection of issues, a more reasonable grouping and ranking of categories would be based on modes. With this in mind, the following lists have been created to show which items are most important within each mode. Many issues relate to more than one category and have been reflected in all that apply.

Arterial Highway Issues

The most significant arterial highway issues, as identified by the consultation process, related to improving the arterial system and ensuring it can be expanded in the future.

The main issues are listed below:

- Common Access Control Policy
- Arterial Grid Completion
- Improvement to Freeway Interchanges
- Railroad Crossing Upgrades
- Right-of-Way Preservation in Transportation Corridors
- River Crossings (new and expanded)
- Signal Coordination/ITS

Freeway Issues

With the rapid growth of the Northwest Valley, freeway capacity is a growing concern.

Regarding the regional freeway system, the main issues are:

- HOV Lanes on Freeways
- Freeway Interchange Improvements
- Freeway Capacity Improvements
- Funding for Freeway Improvements
- Right-of-Way Preservation

Transit Issues

In addition to the longstanding issue of transit funding, the main transit issues are related to and reliant on, at least in part, the roadway priorities of the present.

Preserving options for the future when the need for transit becomes more imperative is part of a long-term view toward transit in much of the area. Transit issues are:

- Elderly Mobility
- Funding Transit Expansion
- Funding Freeway HOV Improvements
- RR Crossing Upgrades
- Right-of-Way Preservation for High Capacity Transit
- Non-Motorized Access

Bicycle/Pedestrian/Alternative Modes Issues

The following list is an indication of which items are most important within this category, but it must be noted that these do not rise to a level of priority comparable to the preceding modes. They are listed here because they represent a component of the overall transportation plan:

- Elderly Mobility
- Policies for Pedestrians
- Non-Motorized access

Policy Issues

These items require a practice standard or policy direction by the cities or regional agencies to establish a method to maintain consistency in the handling of key issues. In general, these will work best if there is agreement at a subregional or regional level to support a common understanding of how such policies or practices will be applied:

- Common Access Control Policy
- Elderly Mobility
- Luke AFB
- Funding Freeway Improvements
- Pedestrian Facility Improvements
- Right-of-Way Preservation

6.2 Other Issues

Though not specifically identified in the issues above, there is a common thread that links most of the highest priority concerns in the

Northwest Valley. All agencies and interests, despite a consistently strong and positive view of the future, see their most urgent transportation issues as solving current problems. Few of the issues above focus on a long-term transportation solution that will accommodate the level of growth anticipated in the Northwest Valley.

The high showing by “elderly mobility” and “preserving rights-of-way” are two important exceptions to the focus on short-term solutions. They reflect the aging of the population (and the elderly population already in the area) and the need to mitigate what has been a limitation to past programs, namely, the unavailability of rights-of-way to provide for ever-expanding capacity needs.

6.3 Report Structure

For simplicity, the discussion of issues has been divided by mode with references to other modes as appropriate to address key intermodal issues. This is consistent with how project funding is allocated in the MAG region. However, the intent is not to segregate modes in the plan, but to build from the comments received and information gathered toward a multimodal strategy for the Regional Transportation Plan. The report also identifies the timeframe 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 readily discernible from present data or trends, but which manifest themselves only at higher (later) levels of development. The accompanying maps help to further clarify the regional context of the challenges in the area.

6.4 Highway Issues

The primary emphasis in the development of the Northwest Valley transportation system has been the highway network. The area is

served by a partial grid system that connects the major activity centers with a hierarchy of roadways ranging from local streets in neighborhoods to limited access freeways for interregional travel. The exceptions to the grid layout are Grand Avenue, which is diagonal, and discontinuities in the grid itself, particularly in the Sun Cities' area and north and west of Loop 101.

A major challenge is the discontinuity and the irregularity of portions of the arterial grid. Section line roadways are often interrupted by major developments or other installations that have been in place since long before the growth of the past 20 or so years (e.g., Luke AFB, Sun City, riverbeds). The current process of requiring improvements as part of individual development approvals has led to uneven roadway widths adjacent to those developments that are not necessarily based on projections of the actual need for capacity.

The questions therefore raised are: 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.

Riverbeds also disrupt the arterial grid. Many river crossings become impassable during heavy flow periods, and in some locations, alternative crossings are not available or are so far away that they are not realistic options. This problem can be remedied by adding the necessary bridges, though there is a question about where they should go.

Luke AFB and, to some extent, major developments may require more creative solutions such as adding capacity to roadways that serve the perimeter of the base. Uniform policies for roadway widening when capacity is needed can help if they are applied similarly by all agencies. This raises issues of equity and the role the government should play in "smoothing" the effect of currently disjointed practices. For example, identifying and preserving opportunities for future roadways and alternative modes is recognized as a major issue in the areas that are now beginning to face development pressure.

A simple comparison of lanes miles to the changes in the total of population + employment over the years indicates that the highway system will lose ground steadily over time. In other words, demand on individual facilities can, on average, be expected to grow significantly. This is a simplified assessment of future conditions, but a conservative surrogate in that vehicle miles traveled (VMT) are growing faster than population + employment.

Where change manifests itself most visibly is in the need for high volume facilities such as freeways and parkways, which experience a projected 44% reduction by 2030. Conditions in the highway system overall deteriorate dramatically (over 30%) toward 2030 as growth significantly outpaces the planned changes in the roadway network. In fact, few new facilities are identified for the time after 2020 in any local plans. Because many of the facilities planned by local agencies may not be implemented by 2020, deterioration in roadway functionality can be expected to accelerate over time.

Table 17: Ratio of Lane Miles to Population + Employment

Facility Type	2000	2020	2030
Arterials/Collectors	2.32	2.15	1.65
Freeways/Parkways	0.71	0.52	0.40
Total	3.03	2.67	2.05

In all cases, there is a substantial cost associated with completing and enhancing the Northwest roadway network. That cost will increase as time passes. In general, because of mounting roadway congestion, highway capacity is viewed as the most pressing short-term need. As the area continues to grow, it will become more and more imperative to identify policies and funds that ensure reasonable service levels and quality of life. A major challenge will be to balance funding among all the key transportation categories to address both long and short-term needs as well as various modal options.

The highway issues are divided into two categories in the following paragraphs: 1) regional issues and; 2) local issues with regional implications.

6.4.1 Regional Highway Issues

Maintain, Protect and Enhance the Regional Arterial Street Grid

There is broad consensus in the Northwest Valley that the arterial grid is essential to the orderly future growth of the area. It is less clear how the obstacles to the completion or even the improvement of the grid can be overcome and to what extent each community can contribute to a solution. Topography, established communities, Luke Air Force Base, and some river crossings prevent a uniform treatment of the arterials in some areas. So, while there is interest in mitigating as many grid obstructions as possible, there is also interest in developing as much capacity

as possible on facilities that help circumvent the discontinuities.

Much of the growth in the Northwest Valley will occur in the areas north and west of Loop 303 and there is considerable effort invested in identifying additional opportunities for roadway capacity to accommodate it. The challenge will be to reestablish a kind of grid access in areas that are limited by topography and facing extensive development potential. In the absence of an adequate grid expansion, most trips will be on the regional freeway system and on limited surface arterials and streets, resulting in congestion and inefficient overall system usage.

Completion of a Loop Outside of Loop 101 (Loop 303)

Loop 303, located outside of Loop 101, is becoming a critical link in the system as development moves farther from the central areas. Though removed from the regional freeway program in 1994, Loop 303 has already been relied upon by development activities in the area. Cities and new developments have also begun to identify their objectives for the new facility and prepare for its construction with projects that would depend on Loop 303 for primary regional access.

One challenge will be the appropriate character of the roadway. While there appears to be support for a freeway facility from area communities and stakeholders, there is also a demand that the new roadway not negatively impact existing communities.

Those most concerned with community impacts favor a parkway with limits on truck traffic. Luke AFB has concerns related to the intrusion of associated land use changes and its possible impact on the base mission. Present efforts by ADOT (as well as the current facility owner, MCDOT, under an Intergovernmental Agreement with ADOT) to prepare design concept reports for various sections of Loop 303 are making provisions for a freeway. In this study, demand for the facility as a whole based on projected growth in the entire West Valley will be considered.

The southern connection to I-10 is reasonably well identified in the vicinity of Cotton Lane. The northern terminus at I-17 was set by the MAG Regional Council to be at or near Lone Mountain Road, which is the subject of present planning efforts. However, there is also interest from some communities to identify an additional northerly terminus at or near New River Road. This additional link could work in concert with other plans to expand the freeway system farther out to create a possible "Loop 505."

Arterial Connection(s) between Loop 101 and 303

The proximity of the Loop 303 alignment to Loop 101 in Peoria offers an opportunity to enhance east-west travel by adding a connection between the two roadways. While a freeway is unlikely to be acceptable given existing development in the area, a major arterial connection could help to better distribute traffic to and between the two roadways. This will be a point of discussion with the cities of Peoria and Glendale, as well as development efforts in the area. A north-south link would also have advantages, if it connected to a new or improved facility along New River north of Loop 303.

Grand Avenue Improvements

Grand Avenue and the Loop 303 are two of the major corridors relied upon for regional travel that might otherwise use the arterial grid. Improvements to Grand Avenue are partially provided in an extensive regional expansion program to build grade separations between I-17 and Loop 101. The segment between Loop 101 and Loop 303 is under study. Because of its location and the limitations imposed by roadway access to adjacent land uses and the railroad, Grand Avenue may need to be viewed as more than a roadway corridor. This will become particularly relevant if commuter rail, light rail or bus rapid transit prove feasible at a future date.

(Note: For more information on these improvements please review the latest Grand Avenue Northwest Study and the High Capacity Transit Study. System alternatives will be defined consistent with those studies' findings and current work underway in the next phase of the Grand Avenue MIS.)

Add and Improve River Crossings

A number of cities need additional river crossings to maintain reasonable levels of circulation in and around their communities and to provide an acceptable level of emergency response in and among the communities. While provision of river crossings is often precipitated by local needs, they are regionally critical in the completion of portions of the arterial grid. The cities of Youngtown, El Mirage and Peoria have identified new river crossings of the Agua Fria River at Olive Avenue and New River at Beardsley Road as significant to resolving current and anticipated congestion issues in their communities. Other roadways that will require crossings include new facilities such as Jomax, Deer Valley and others west of Loop 303.

Eliminate or Improve Handling of Scalloped Streets Issue

Scalloped streets refer to a “saw tooth” effect along a street right-of-way that generally results from the way development funds roadway improvements. This leads to changing lane configurations along a street that create congestion points and potential safety concerns. The variable effect can also result from differing street classifications between two or more adjacent jurisdictions.

This issue calls for a policy resolution. It occurs when development projects happen “out of order,” meaning development midblock or away from an already widened section of the street precedes the development of land adjacent to the widened sections. In general, each city can adopt policies to address scalloped streets, but when the effect is compounded by cross-jurisdictional manifestations of the problem, a regional or sub-regional policy solution including funding options may prove more effective. The challenge is to find an approach that will preserve a community’s plans/objectives while ensuring a consistent treatment of the transportation system.

Protect Rights-of-Way Needed for Future Roadways and Facilities

As development activity shifts outward from the urbanized areas, there is growing interest in building or at least protecting the rights-of-way of future facilities to accommodate such growth before the impact is felt.

Carefree Highway is a primary focus of this concern as development activity moves closer to its present alignment. Plans to protect its viewshed as well as its Sonoran Desert character are high on the list of preservation objectives. Growth in Buckeye and Surprise may strengthen the need to construct or improve the CANAMEX Corridor and

Wickenburg has long supported development of the CANAMEX as an option to relieve truck traffic through its downtown.

Grand Avenue is already facing encroachment that will limit opportunities for future improvements to the north of Bell Road. Right of way for new facilities desired by local/regional agencies and/or other stakeholders that would require preservation must be identified today, before the opportunity is lost.

Add and Improve Freeway Interchanges at Key Locations

New or improved interchanges have been identified by cities at locations where economic activity has grown and begun to overload existing interchanges or impact adjacent streets. Locations identified as needing new interchanges include:

- Bethany Home Road
- Loop 303/Grand Avenue (future)
- I-10/Bullard
- I-10/CANAMEX Corridor
- I-17/Dove Valley Road (future)
- I-10/Johnson
- I-10/Loop 303
- I-10/Perryville Road
- I-10/Watson Road

Those that require improvements to upgrade the interchange capacity include:

- I-17/Happy Valley Road
- I-17/Carefree Highway
- I-10/Sun Valley Parkway
- I-10/Dysart Road
- Loop 101/Peoria Ave
- Loop 101/Grand Avenue
- HOV Ramps
 - I-10/59th Avenue
 - I-10/79th Avenue
 - I-17/Peoria Avenue
 - Loop 101/59th Avenue
 - Loop 101/Bell Road

- Loop 101/Maryland

Interchanges will also be needed on new facilities such as Loop 303.

Widening of Existing Freeways

Based on ADOT's assessment of future traffic volumes as forecast by MAG, all freeways in the Northwest Valley will require substantial expansion to accommodate the traffic projected in the area. I-10 has been shown to need five general-purpose lanes plus at least one HOV lane in each direction as far west as Sun Valley Parkway by 2025. Likewise, I-17 will need five general purpose lanes and an HOV lane between Loop 101 and New River by the same time. While widening Loop 101 is not specifically mentioned, growing traffic volumes will necessitate an additional general purpose lane and HOV lanes to address demands in the corridor.

Widening may be problematic on freeways such as I-17 between I-10 and Dunlap given the extensive development already in place within the corridor. How the need will be addressed requires substantial further refinement over the coming years.

6.4.2 Regionally Significant Local Highway Issues

A number of projects originate from local needs, but have wide-ranging effects on the region because they pertain to regional facilities or address impacts of regional traffic through local areas. This section identifies those roadways that are of specific interest to individual cities, but which have implications for a much broader sector in the transportation plan of the future.

Remove Through Traffic from Wickenburg Downtown

The Town of Wickenburg has seen a rapid increase in heavy commercial traffic through

its historic downtown as demand for goods movement and intercity travel to metropolitan areas to the north (e.g., Las Vegas, NV) has grown. The town has long studied the best way to offer an alternative to the current US 60/US 93 route. The latest plans identify a bypass south of the town connecting US 60 and US 93 to the west of the Downtown. Funding for the project has not yet been identified and various options are under study. The CANAMEX Corridor, a regional project that is also not funded, could offer a solution if funding can be made available in the near term.

Development of Northern Avenue Superstreet

The City of Glendale electorate recently approved the imposition of a local city sales tax to improve transportation throughout the city. Among the projects identified was the expansion of Northern Avenue to a "superstreet" from Grand Avenue to Loop 303 as a means to at least partially mitigate east-west mobility needs in the Northwest Valley. The definition of a superstreet is not yet fully developed, but it is likely to include widened intersections, extensive use of ITS, some access restrictions and possible grade separations. This project has implications beyond Glendale. Peoria and El Mirage have frontages along Northern Avenue that need to be incorporated into the plan for the facility. Luke AFB, at the west end of the project, has voiced concern about the roadway's possible effect on operations and has asked it be at least partially rerouted along an alignment farther from the end of the main runway, perhaps to Olive Avenue.

Sun Valley Parkway/Bell Road Improvements

Heavy anticipated growth in Buckeye and Surprise is expected to strain Bell Road's capacity because there are few east-west links in the area. In fact, only three roadways other than Bell Road access Surprise today.

In addition to improvements to Bell Road itself, there is interest in making another connection from Sun Valley Parkway to Grand Avenue north of Surprise. A specific location has not been identified, but the additional link could draw some traffic away from Bell Road if land use decisions to support such a flow of traffic are made concurrently.

Sun Valley Parkway has been identified for possible extension northward to Grand Avenue. Such an extension could help divert vehicles from Bell Road, but the benefit of that improvement will need to be measured against the results of the alternatives modeling.

Connection of Olive Avenue Across Agua Fria River

Olive Avenue is a low water crossing at the Agua Fria River. During high runoff periods, the crossing becomes impassable and limits access for thousands of drivers who are forced to find alternative routes. Both Youngtown and El Mirage view Olive Avenue as a critical link in their future. As a result, they recognized that they will need an improved crossing of the Agua Fria River. While this connection will serve proposed growth in the two communities, it will also be a major addition to the arterial grid in the area as the facility would be able to carry more traffic and relieve adjacent arterials.

Beardsley Access to Loop 101 at New River

The cities of Peoria and Glendale have been evaluating how a connection to the southbound direction of Loop 101 could reduce congestion at the interchanges of the freeway and 75th Avenue and Union Hills. The project would also offer an additional river crossing in addition to the additional capacity. This connection could also serve as part of a link needed in this area between Loops 101 and 303.

Hassayampa River Crossings

The Town of Buckeye has indicated that proposed development in their community will extend westward of Sun Valley Parkway. A connection between the CANAMEX Corridor and Sun Valley Parkway would afford motorists substantially better accessibility to areas west than simply relying on I-10.

Indian School Road at Agua Fria

A new bridge is proposed on Indian School Road to improve capacity across the Agua Fria in the area immediately north of I-10. Widening of the McDowell Road bridge is also recommended.

Major Arterial Intersection Improvements

The City of Glendale included a long list of intersection improvements among the top priorities for transportation in the city. Similar views are held among other communities as a way to expand capacity without a major widening of the entire corridor. Though these are local improvements, an orchestrated regional plan to address street intersections in a logical and measured fashion could help to improve traffic flow in some areas.

Regionwide Signal Coordination

Recognizing the interconnectedness of Northwest Valley travel, cities and towns have indicated a need to improve the management of traffic through the coordination of traffic signals. This requires installation of significant infrastructure to be most effective and only two cities have those systems in place or are prepared to implement them in the near term. A number of arterials in the Northwest Valley are part of the MAG ITS Strategic Plan implementation program and could be the basis for joint funding applications for federal Congestion Mitigation and Air Quality (CMAQ) funds that could help speed system development. There is also the potential of temporary resource sharing arrangements

that could move the area toward the long-term objective. This is still a challenging issue, but one that can yield some relatively quick benefits if neighboring cities view the need and the solution from a common regional perspective.

6.5 Public Transportation Issues

Public transportation is supported in concept in the Northwest Valley but there are concerns regarding funding availability. Communities that have obtained public support for local transit funding (i.e., Phoenix and Glendale) have much better developed programs in place and a better long-term understanding of their public transportation needs. Others are just beginning to incorporate transit and alternative modes into their city programs.

The most common challenge identified among the Northwest 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 outside the urban core have begun to recognize the limitations of relying on the highway system alone to handle travel demand in the future. With the exception of Phoenix and Glendale and a few specific route issues, transit is currently viewed as a mid-term priority in the Northwest Valley.

Phoenix has a well-developed transit program with an extensive bus system and a light rail transit line under development. Glendale has just begun to improve its own services with the recently approved sales tax and will look at light rail in the future. El Mirage, Peoria, and Surprise have little transit available, but are beginning to identify their own opportunities to expand service in dial-a-ride

and support further fixed route service into their communities. Wickenburg has indicated interest in a local circulator type of service as well as the need for better line haul connections such as commuter rail to the Phoenix area. These plans are generally modest, but show indications of a shift in perspective toward the role of transit even before the need arises. This will help improve long term transportation planning and allow better coordination of public transportation plans with growth and development.

6.5.1 Regional Public Transportation Issues

Regional Transit Funding

The main concern in the Northwest Valley about transit service is funding. Except for Phoenix and, more recently, Glendale, there is no locally dedicated source of funding for transit in the area. All other communities rely on limited funds from the state to pay for dial-a-ride services within their own limits. On the other hand, there is interest from most cities to provide for transit as they build out. The key is to identify specific projects that will aid movement in their areas given the type of land use and commercial futures they are likely to experience. As with roadways, a challenge will be to determine how to distribute any future funding to support a balance in transit versus any other elements of the ultimate transportation plan.

Extension of Transit Services into Western Communities

Phoenix and Glendale have specific plans for how they will expand transit services in the next 15 to 20 years or so. They also have the funding with which to make much of it happen. Other communities are in the process of identifying how transit will serve their needs. Peoria and Surprise, for example, have adopted plans to gradually improve upon the

limited paratransit service currently available. Wickenburg believes there is a need for a shuttle to downtown as development in the outer portions of the town occurs. Should the prospect of commuter rail or light rail prove viable, preliminary indications are that communities along the Burlington Northern Santa Fe (BNSF) railroad line will likely support the effort if funding is available.

It would be reasonable to consider that, even if transit service is not extended westward in the near future, an effort be made to shape a regional program to provide for transit needs, much the way right-of-way can be protected for highways. This could be in the form of right-of-way reservation for transit improvements or expanded standards for roadways that can be expected to carry transit services in the future.

6.5.2 Long Term Plan for Light Rail or Commuter Rail 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 BNSF Railroad right-of-way because the corridor is already defined and offers access to many major destinations. Even outlying communities such as Wickenburg view commuter rail as an opportunity for their residents to access downtown destinations in the more urbanized areas of the Valley. BNSF has also shown some willingness to discuss the prospects of passenger service as they consider ways to make their own operations more efficient through possible relocations of yards and services.

Without cooperation from BNSF, the likelihood of using the existing corridor for high capacity transit service on or adjacent to the railroad right-of-way would be significantly impaired. A

key consideration is the volume of freight traffic that currently uses or could be expected to use the tracks if it were to be shared with passenger traffic. Diverting regional and through freight traffic to another route would reduce the demand for the Grand Avenue line and open the opportunity for cooperatively using the track.

Bus Rapid Transit/HOV Lanes on Freeways

Many of the cities have mentioned the need to build or extend HOV lanes for ridesharing or transit immediately to accommodate growth in traffic on Loop 101, I-10, and I-17. In the latter two cases, HOV lanes have only recently been provided, yet there is a concern that they do not extend far enough into the growing areas of the region. ADOT staff expectations are that HOV lanes will need to extend as far as New River on I-17 and Sun Valley Parkway on I-10 within the next ten years.

HOV lanes provide a good foundation for bus rapid transit (BRT) options that could offer attractive regional service within a relatively short period of time. While BRT is not yet a household concept, it is likely to gain favor over time. In the Valley of the Sun, BRT is currently only under development in a limited way in Phoenix. Other communities have studied BRT possibilities and begun to take a serious interest in the reduced cost of BRT technology compared to generally more expensive rail options. Currently, the main issue with BRT is the varied number of interpretations of its definition. Low-end versions are purported to carry high numbers of passengers in high-density locations where the transit ridership is already well established. High-end systems approximate many of the characteristics of light rail transit and help to generate ridership by attracting people to the system. In the Northwest Valley, a critical decision would be to decide

where BRT makes sense and where it can be readily accommodated if built into existing or proposed bus routes or given a dedicated space within a roadway corridor.

6.5.3 Regionally Significant Local Public Transportation Issues

Subregional Loop Service in Surprise and Neighboring Cities

The City of Surprise has determined that a small transit service connecting key destinations in the Surprise, Peoria, Glendale, Youngtown, and El Mirage area could be the beginning of an effective subregional service. Such a service could also become a building block for more extensive regional service in the area. The proposed “Figure 8” route would require moderate funding from all benefiting communities. Most have shown a level of interest, but are reluctant to join the plan citing funding constraints.

Extension of Existing Bus Services

A number of communities hope to be able to benefit from extensions of current Valley Metro service if funding becomes available. This is one of the simplest ways to improve transit in the growing areas of the Valley. For example, El Mirage would like to receive service from an extension of existing Route 106 and Peoria and Surprise identify a number of extended routes in their transit plans. This opportunity will hinge on the availability of a funding source.

Extension of Light Rail Line Through Glendale

The City of Glendale will build an extension of light rail off the Central Phoenix/East Valley system currently under design. Funding is expected to be available for the project from the recently approved local sales tax increase, but there is still a series of steps required before it can proceed. This is a local effort that could portend expansion westward if it

proves successful. Other communities (e.g., Peoria and Surprise) are considering the possibilities of light rail, so it should be evaluated as part of a regional long-range transit plan.

6.5.4 Bicycle/Pedestrian Issues

Most participants in the process mentioned bicycle and pedestrian issues in their areas. On the other hand, those issues did not rise to a level of criticality compared to highways and transit. Most non-motorized modes projects tend to be viewed in a recreational context and not as a solution to transportation problems. Bicycles generally do not provide mobility the way a car does. In addition to the climate, the character of development with generally long travel distances discourages reliance on bicycles as a primary mode. These issues are described as something that can be provided as more pressing needs are addressed, such as highways.

6.5.5 Regional Bicycle/Pedestrian Issues

Take Advantage of Recreation Corridors

While they may be developed as part of a recreational plan, bicycle and pedestrian paths can serve the community for limited non-recreational tripmaking. Even in a riverbed, if a corridor affords access to amenities, schools, and retail, people have the choice to use something other than the automobile to satisfy their travel needs. The West Valley Rivers Master Plan is a good 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.

While the recreation corridors offer reasonably good opportunities to complete a regional system of bicycle and pedestrian linkages, they do not directly access many of the area's key destinations. Because transportation in the Northwest Valley has been built upon highways, it is reasonable to link future plans for bicycle and pedestrian systems to street plans. The real challenge will be the manner in which the plan is designed and standards applied to satisfy concerns about safety and accessibility. The local preference for secondary streets may not afford the comprehensive plan that is preferred by bicycle users and expected as part of the Regional Transportation Plan.

6.5.6 Regionally Significant Local Bicycle/Pedestrian Issues

Use Secondary Streets, Not Major Streets

The consultation process showed that the view of the officials interviewed is that for most casual bicycle riders, less congested, slower, secondary streets are preferred to the mile and half-mile arterials. Though most Circulation Elements show bicycle lanes on both arterials and collectors, there is concern about mixing bicycles with higher speed automotive traffic though there is also recognition that traffic laws cannot prevent a bicyclist from using any of the public street system for travel.

The nature of the issue of integrating a system of bicycle paths and pedestrian amenities across jurisdictional lines rises as discontinuities multiply. The limited number of river crossings, the discontinuity of the arterial grid, let alone non-arterial streets, all challenge a regional bike lane or bike route plan to aid commuters. It will be important to ensure all parties agree on the same linkages as part of the ultimate buildout of the bicycle and pedestrian systems. In the absence of a

common understanding of how to implement the plan, it will remain a recreational amenity.

6.6 Goods Movement Issues

Much of the truck traffic in the Northwest Valley uses I-10 to access the many distribution centers in Avondale and Tolleson. In general, they do not simply pass through the area, but interact with local freight operators before continuing through.

The consultation process revealed an interest in effective, efficient corridors for trucks and goods, mainly the freeway system, but a rejection of corridors that would interfere with other activities. The primary concern about goods movement is the impact truck traffic has on adjacent development. Most believe that freight transportation in the future would be provided for by CANAMEX and the freeway system, as well as the BNSF mainline on Grand Avenue or in a future location farther west. How or if trucks would use certain arterial corridors is not yet fully understood by each community and little provision has been made so far to accommodate heavy vehicles in new growth areas. Regarding timing, the main factor in the priority of goods movement improvements is the effect truck or train operations have or are expected to have on local residents and businesses.

Recent survey information about truck traffic and interviews with truck operators and distribution centers in the area of the southern half of the Loop 303 corridor indicates a high percentage of trucks destined to places outside the Valley of the Sun. Given the concerns about the impact of trucks in residential or sensitive areas, a freeway corridor is most likely the best option to handle such traffic. The issue will be to identify the best location for such trips and to determine if

any of the planned facilities can serve that purpose.

6.6.1 CANAMEX

The MAG Regional Council designated the Wickenburg Road/Vulture Mine Road Corridor as the CANAMEX Corridor to carry international traffic between Canada and Mexico through the Phoenix metro area. While the main objective was to identify a location to handle increased NAFTA truck traffic away from developed areas, the nature of the usage may change before it is built. As Buckeye and surrounding areas begin to grow north of the I-10 Corridor, the need for additional north-south routes will become critical. At the same time, the bypass in Wickenburg, need for another northerly connection between Sun Valley Parkway and Grand Avenue, and rapid growth in Peoria, Surprise and Phoenix along SR 74 could all make it imperative for the RTP to identify a kind of "Loop 505" major arterial or parkway at least partly along the CANAMEX alignment to protect future options. Implementation of a highway or CANAMEX will be tied to the availability of funding for the designated international truck route.

6.6.2 Local Truck Routes

A local concern is that there is no identified system of truck routes in the area to guide drivers. At present, many mining and distribution operations simply use the most direct path available from their pick up point to their destination. This is to a degree provided for in state law. Some interest exists to develop a system of corridors for trucks that would avoid residential areas although there is also a recognition that it would be very difficult to enforce.

6.6.3 BNSF Railroad on Grand Avenue

The BNSF has longstanding customers along Grand Avenue and they plan to continue to serve them into the future. At the same time, they are openly discussing the possibility of moving the main switching operation to a more westerly site. That would free track time along Grand Avenue for transit or other purposes, but more importantly, it could help to expedite freight operations by removing some of them from the congested portions of the urbanized area. In a new location, safeguards could be built in to protect against the infringement upon the new tracks by development. However, how that would be guaranteed is not clear as yet.

6.7 Airport Access Issues

This study does not address aviation issues, but access to key aviation facilities is mentioned as one issue to be kept in mind in designing the future transportation system. Aviation is addressed in the MAG Regional Aviation System Plan.

6.7.1 Luke Air Force Base

A major factor driving decision-making in the Northwest Valley is how the base and its mission can be protected from encroachment of new development or major transportation corridors. This is an immediate issue and one that has drawn significant attention over the past years. Luke AFB is a major contributor to the local economy and will not be easily relocated. This raises the question of roadway alignments that will be compatible with the base. In particular, Northern Avenue as proposed may be the subject of more discussion in the Luke AFB area. Loop 303 passes near the west side of the base, but there is no plan within the base to reorient any of their activities toward the new roadway. That could change over time, so flexibility

should be built into the plan for local access near the base.

6.7.2 Glendale Municipal Airport

Glendale Airport is a reliever general aviation facility with limited charter passenger service. It expects significant growth over the years as various business activities near the airport begin to rely more heavily on its facilities. Access to the airport is off Glendale Avenue, less than a mile west of Loop 101. Glendale Airport is in the path of Bethany Home Road, 111th and 117th Avenues. As the airport grows (it has plans to extend the runway to accommodate larger jet aircraft) access will need to be designed to handle the potential of significantly higher ground traffic volumes to its facilities.

6.7.3 Wickenburg Airport

Wickenburg Airport is small, but the Town has ambitious visions for its growth. It is located

on US 89, a short distance west of town. Though not an immediate issue, its very location outside heavily traveled airspace in the Valley makes Wickenburg Airport potentially viable as a regional reliever for activity associated with new growth in the Northwest Valley. Access from main regional roadways would be significantly improved with a western Wickenburg Bypass connecting SR 60 with US 93 and a possible connection along the CANAMEX Corridor with I-10 in Buckeye. As these improvements are developed, consideration should be given to the opportunities for the use of Wickenburg Airport as a regional facility. Improvements are identified in the Regional Airport Systems Plan, but they do not cover this type of operational expansion.

7. Evaluation of Alternative Packages

Four packages were defined for model testing. Each was formulated to address specific components of the future plan and allow a comparison of key facilities or capital programs against other facilities or programs. The packages do not reflect specific alternatives but are instead designed to indicate how well a key facility or group of facilities contributes or would contribute to improving system performance.

Each of the packages was modeled using the MAG regional transportation model. The modeling results provide some insight into how a plan or potential new facility is likely to operate and contribute towards a systemwide reduction of congestion and general improvement to travel in the area. The packages were modeled by combining projects from all three subarea studies (Northwest, Southwest, and Southeast Maricopa / Northern Pinal County) to permit more efficient application of the regional travel demand model.

These packages focus on highway options, as transit is being addressed in separate studies (MAG High Capacity Transit Study, and the Valley Metro/RPTA Regional Transit Systems Study). Findings from all of the background studies will be considered and analyzed further as appropriate in the RTP process. The outcome of this analysis will be a significant factor in the recommendation of a system for the Northwest Valley, the major elements of which will be considered in Phase II of the Regional Transportation Plan.

Beginning with a 2002 Base Year run, the packages have been defined as follows:

1. Base Year – reflects roadway conditions in 2000 and identifies a starting point for

existing trouble spots and the potential for future system limitations as growth continues (Figure 22.)

2. Future Base (Long Range Transportation Plan (LRTP)-Based Reference) Scenario – includes the current LRTP system, with one principal exception, updated to include additional arterial improvements contemplated by individual communities in their General Plans. This plan also includes a logical buildout of the arterial network grid and likely arterial improvements though they may not yet be identified in the regional plan for implementation. LRTP-specified freeway enhancements are included in this package except for widening of I-17 between Dunlap Avenue and I-10. Other widenings to existing freeways are left for consideration in Package 3 to better assess their contribution to the overall plan (Figure 28.)

Transit facility and service improvements as specified in the current LRTP are included in this modeling package (i.e., a tripling of local bus service, tripling of dial-a-ride service, quadrupling express bus service, and completing a 39-mile light rail system. It also included BRT as well as local circulators for the express bus network and light rail system. A regionwide system of more than 20 public park-and-ride lots was also part of the 2002 LRTP).

3. Enhanced Corridors – Building on the LRTP-Reference or “Future Base” Network, this package includes specific improvements to existing freeways and adding general purpose or HOV lanes to address congested segments (Figure 35.) Widenings to existing freeways were

generally constrained by right of way or infrastructure limits. Upgrading of rural facilities to partially controlled access facilities based on feedback from local communities was also incorporated, e.g. Northern Avenue “Superstreet”, Sun Valley Parkway, and the CANAMEX Corridor north of I-10. Minor additional arterial improvements were also made.

4. New Corridors – Potential new freeways and partially controlled access facilities are tested in Package 4⁶. This includes:

- Loop 303 as freeway from I-10 to I-17
- New River Extension freeway from Loop 303 to New River Road
- Wickenburg Bypass – new facility
- Carefree Highway Expressway – 6 lane expressway.
- Loop 101/Loop 303 Connector
- I-17 improvements:
 - Option A, 20-lane facility between Loop 101 and I-10.
 - Option C, an additional lane in each direction between Peoria Avenue and Loop 101.
- Various freeway interchanges.

5. Total Package – This package is intended to add all elements together and represents the only package that contemplates significant transit improvements based on the work from the High Capacity Transit Study and the

Regional Transit Systems Study. It will not be modeled for the Subarea studies.

7.1 Base Year

The Base Year model run shows current limitations in the system and provides a starting point in the analysis to address future challenges. Most of the issues identified in the Consultation Plan as part of discussions with local jurisdictions are based on the understanding of problems in the transportation system today, and the base run model results helps confirm and expand upon consultation feedback on the key issues that need to be addressed. Cities and other agencies want assurances that a future system will resolve those difficulties. At the same time, the Base Year begins to show how the existing system foretells the need to introduce new facilities and services to correct problems that have developed over time. While it may not show specific future needs, it can indicate the beginning of trends that are likely to grow in conjunction with anticipated changes in land use.

7.1.1 General Description of Roadways System

The Northwest Valley is served by a partial grid roadway system that connects major activity centers with a hierarchy of roadways ranging from local streets in neighborhoods to limited access freeways for interregional travel. The concept of the street network’s grid roadway system is a series of north/south and east/west arterial roadways, which provide access to adjacent land uses, generally consistent application of traffic control regulations, and a significant level of regional movement.

⁶ Three options or alternative scenarios, referred to as Options A, B, and C were modeled regionally. Only Options A and C were relevant to NWATS. Option A and C are similar except in the treatment of I-17 between I-10 and Loop 101. Option A adds substantial new capacity equivalent to approximately five or six additional lanes in each direction while Option C reflects the existing long range plan with minimal widening.

Though not complete, much of the existing street system layout is either in place or planned according to a grid concept. The main exception to the grid layout is Grand Avenue, one of the area's original roadways, which runs northwest/southeast through the Valley. Grand Avenue is US 60 and the major surface roadway in the Northwest Valley. It provides a high level of access to area uses that have evolved along the roadway, but it also disrupts the grid traffic pattern.

Among the impacts of Grand Avenue are the creation of complex six-legged intersections and truncation of local streets that reroute local traffic onto the arterial system for even very short trips.

Additional characteristics that define the Northwest Valley Highway Network are shown in Table 18. These will be used as

a basis for further analysis along with the anticipated land use changes to help establish network sizing goals for the area.

7.1.2 Traffic Signal/Intelligent Transportation Systems

The signal systems and coordination in the Northwest Valley are operated independently by each city. With the exception of Phoenix, there are no central signal control systems among the local agencies in the area, limiting opportunities for areawide implementation of signal coordination in the near future.

Consistent with the MAG ITS Strategic Plan, Phoenix, Glendale, Peoria, and Surprise are part of the regional program to encourage signal coordination across jurisdictional boundaries.

Table 18: 2002 Centerline Lane Miles and Lane Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	14	58	22	86
BUCKEYE	31	108	102	331
EL MIRAGE	17	44	17	44
GLENDALE	115	484	183	648
GOODYEAR	41	108	55	148
LITCHFIELD PARK	5	17	7	26
PEORIA	105	349	115	379
PHOENIX	193	854	253	1,104
SURPRISE	69	188	173	450
TOLLESON	1	5	4	27
WICKENBURG	4	14	14	58
YOUNGTOWN	0	1	1	4
MARIC CO	357	987	89	308
TOTAL	952	3,218	1,034	3,614
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeways			131	648
Expressways/Parkways			70	197
Collectors			138	294
Arterials			695	2,475
TOTAL			1,034	3,614

Figure 23: 2001 Network: Average Daily Volumes

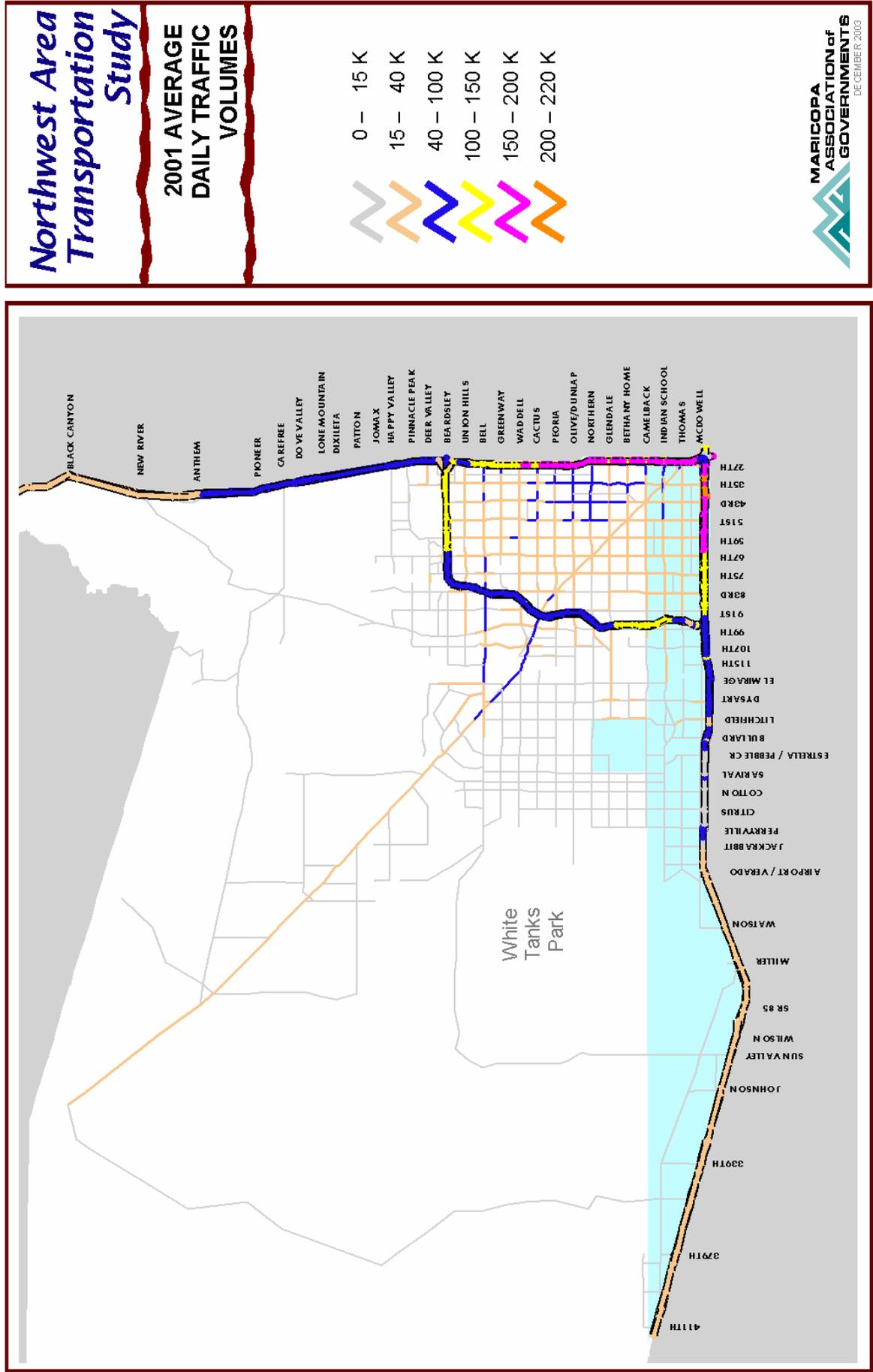


Figure 24: 2001 Network: Freeway Level of Service

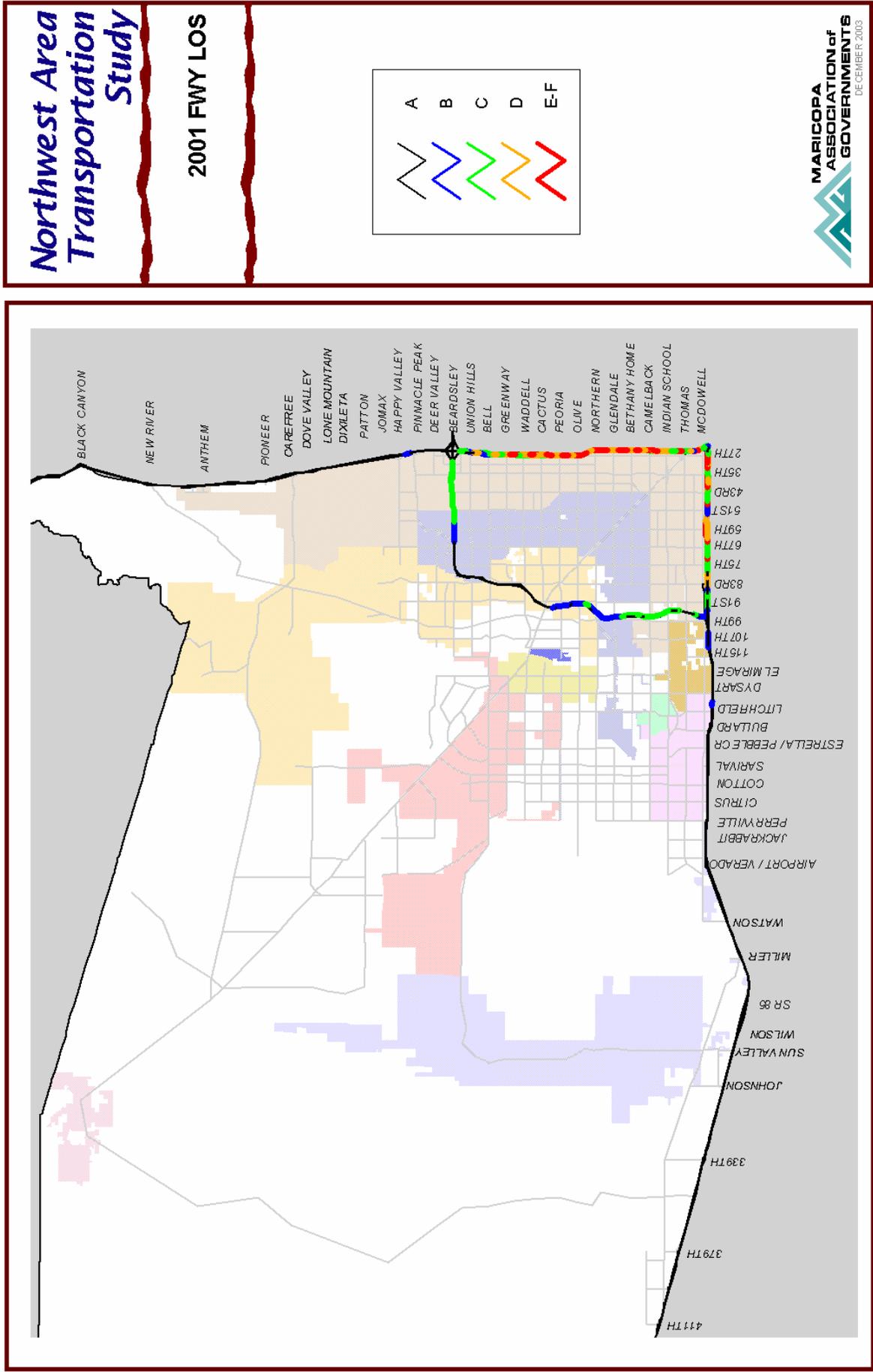


Figure 25: 2001 Network: HOV Level of Service

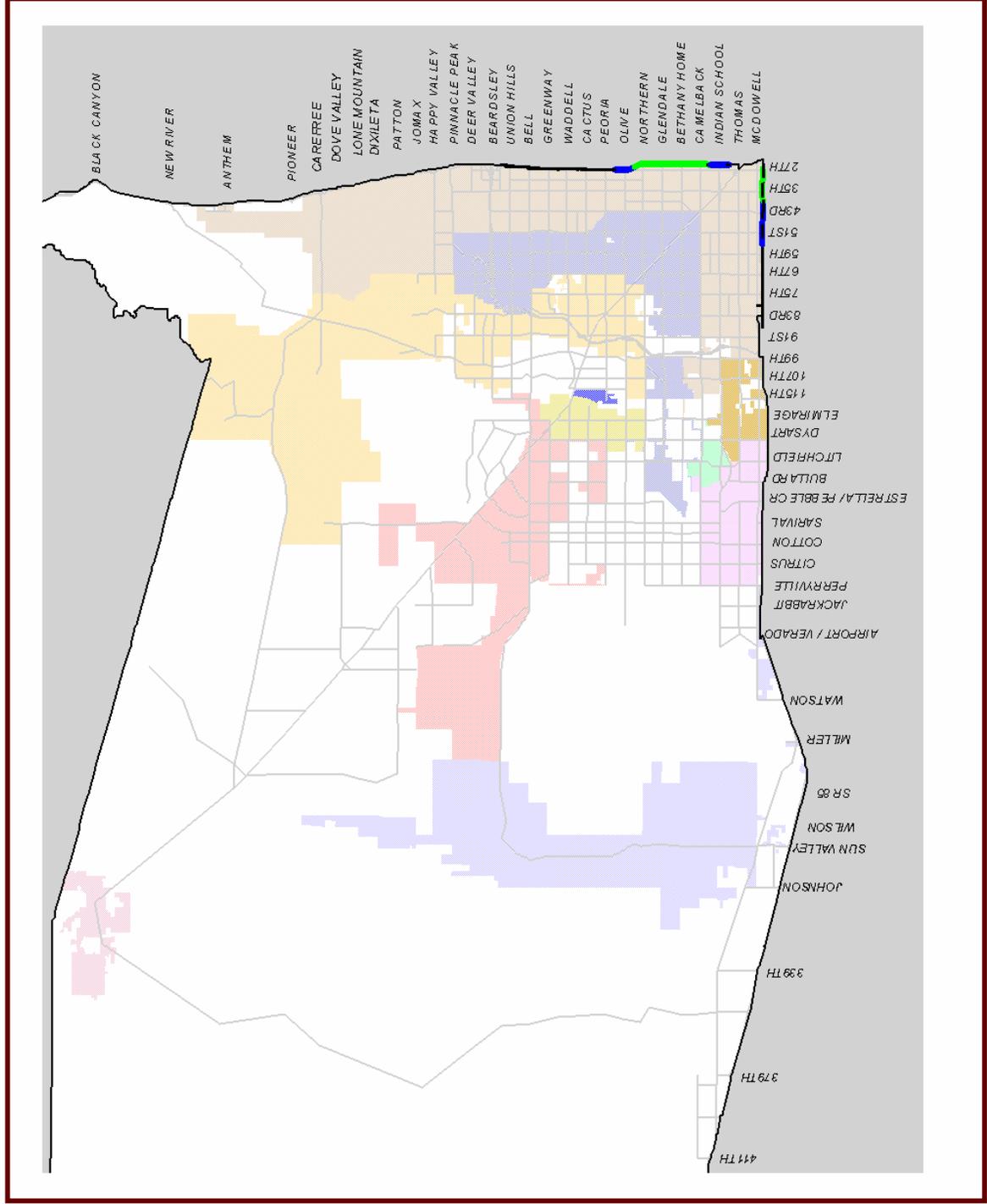
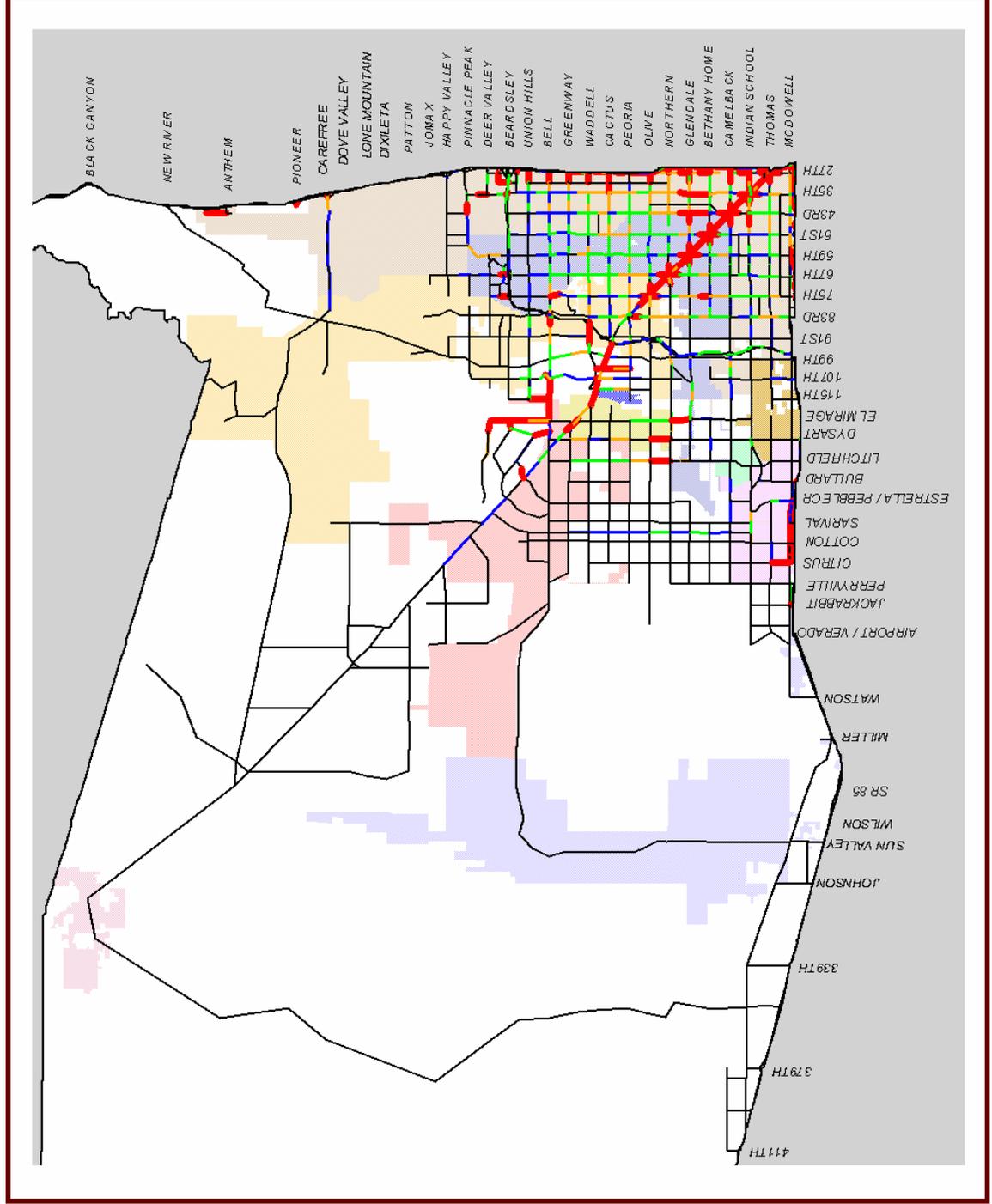


Figure 26: 2001 Network: Arterial Segment Level of Service



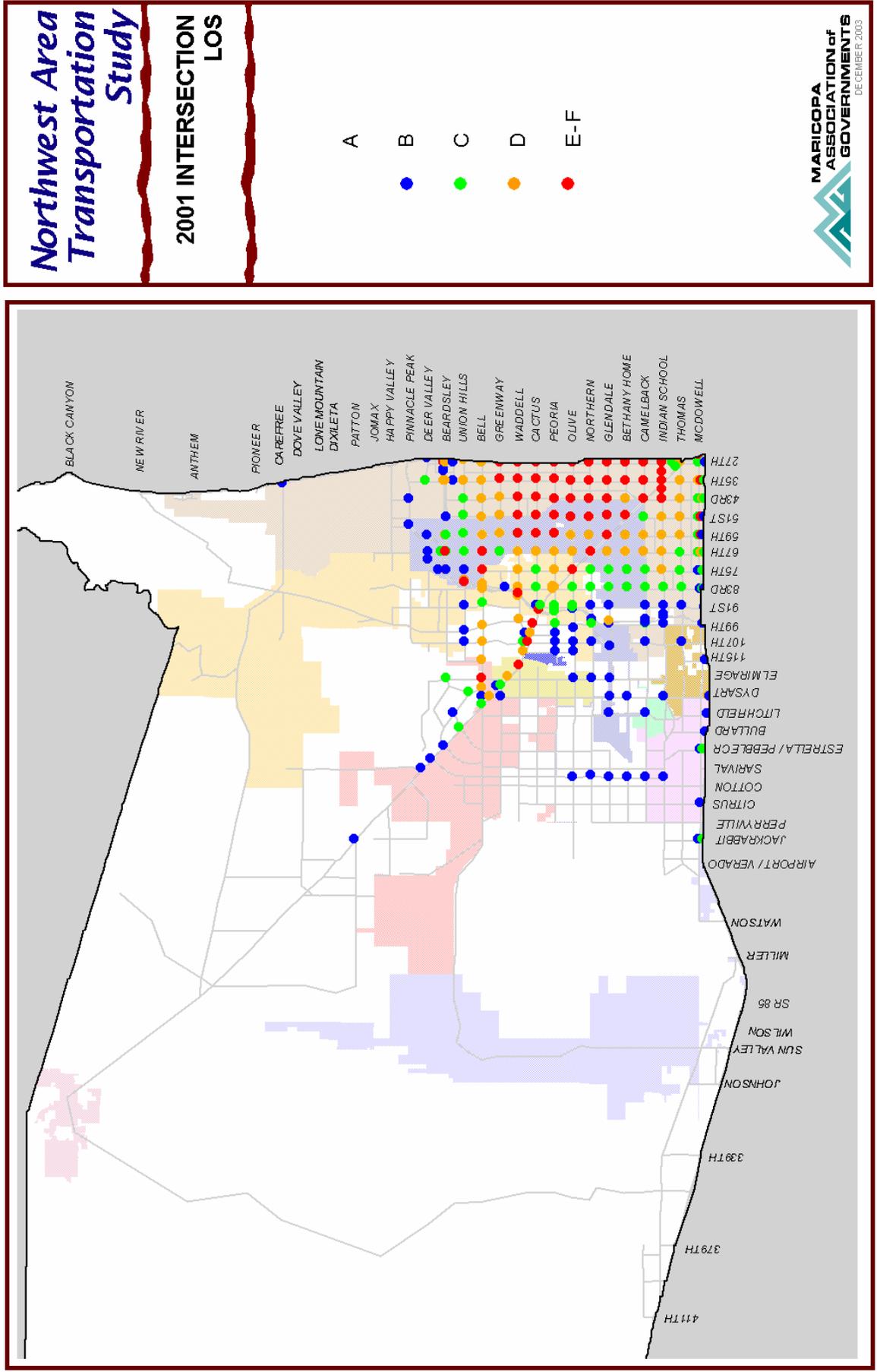
Northwest Area Transportation Study

2001 STREET LOS

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MARICOPA ASSOCIATION of GOVERNMENTS
DECEMBER 2003

Figure 27: 2001 Network: Intersection Level of Service



7.2 Future Base Network (LRTP-Based Reference Scenario)

The current Long Range Transportation Plan represents a vision for 2022 and includes a number of enhancements to the existing system. The future base network contains an extensive expansion of roadways to the west and north of the currently urbanized area. Most of the new arterial facilities are tied to future developments that are expected to fund needed transportation projects in conjunction with land use improvements. Among these new roadways are some that could be designated as high capacity arterials to either help complete the grid or provide added capacity within the existing grid.

Each community or agency has offered changes based on the latest information in the transportation or circulation elements of their General Plans and the closure of critical gaps in the arterial grid. Some of these adjustments are incorporated at the request of the local agency to test their value in the system plan. Should they prove important in terms of travel demand, they typically will require further study to determine feasibility and acceptability to local communities and stakeholders before they could be designed and constructed.

The Future Base network is a foundation upon which to build the future Northwest Valley network for the RTP. Among the major components of this option is Loop 303, which is shown as an expressway, Grand Avenue improvements, additional arterial river crossings and gap closures in the arterial grid where appropriate. These projects have been included in the Future Base Network model runs to reflect a future plan that is more compatible with the many growth-related changes since the LRTP was adopted. As in

the lists of projects identified by the cities, there may need to be additional evaluation of some of these new roadways before they can be considered in the Regional Transportation Plan.

This network attempts to strengthen the integrity of the arterial grid by proposing an extension of grid roadways in areas identified for future growth. The Buckeye MPA is a good example where high anticipated growth in some land use scenarios could necessitate a robust network to manage traffic effectively. The Future Base Network shows a dense network of new roadways associated with possible development in that area. Similarly, though substantially less dense, grid linkages are proposed for the unincorporated areas in northern Surprise and Peoria. However, most of the roadways in those cities have been taken from their General Plans.

Other key additions to the Future Base network are new river crossings and reflection of changes already identified in studies such as the Grand Avenue NW Corridor and various improvements in Glendale as a result of their successful sales tax election in 2001. Note the development of the arterial grid is led by local jurisdictions and is subject to change, particularly in rapidly-growing suburban areas.

7.2.1 Key Elements of the Future Base Network Arterials

- Sun Valley Parkway/Bell Road – widened to 6 lanes and modeled as an expressway. It is the major arterial for development west of the White Tank Mountains in Buckeye.
- Grand Avenue - widened to 6 lanes as far as Loop 303 in accordance with the recent MAG Grand Avenue NW Corridor study and previous studies.

- Happy Valley/Jomax - shown as a 6 lane roadway east of I-17 (connecting at a common Loop 303 interchange). This roadway is a significant reliever for Bell Road across the northern tier of the Northwest Valley.
- Carefree Highway – widened to 6 lanes from I-17 to Sarival Road (163rd Ave), 4 lanes from Sarival to US 60. The easterly portion provides capacity for major growth in the North Phoenix area. The westerly portion is part of the rural highway or expressway concept to enhance capacity and protect right-of-way.
- Perryville Road – widened to 6 lanes from I-10 to Bell Road. There are few north-south routes between Loop 303 and the White Tank Mountains. This will need to be further evaluated for feasibility but offers an option for improved local access in the area that will help with distribution of sub-regional traffic as the area grows.
- Dysart/El Mirage – identified as a 6 lane road with a possible connection near the City of El Mirage. The alignment is designed to be able to take advantage of a combination of the two roadways as a key north-south arterial that runs from Carefree Highway to I-10. The specific analysis that will need to be done is to assess if the two roadways will function better than an enhanced single six-lane arterial that extends the length of the study area.
- Beardsley Road – 6 lane arterial connection to Loop 101 and basis for an enhanced arterial connector/expressway between Loops 101 and 303, using both Lake Pleasant Road and Happy Valley Road. The proximity of the two freeway type facilities in this part of the Northwest Valley is likely to promote travel between them. An improved connector that can carry high volumes is proposed as a means to provide sufficient capacity and minimize impacts to adjacent development.
- Lake Pleasant Road – widened to 6 lanes from Deer Valley Road to Carefree Highway. It will serve major growth along this corridor.
- Peoria Avenue – new crossing of the New River is desired by Youngtown and El Mirage and will afford an additional all weather crossing of the New River.
- Cactus Road - new crossing of the New River. Similar to Peoria Avenue, but subject to more challenges. Youngtown may have concerns about impact to Town facilities and increase of traffic in the community.
- Thomas Road – new crossing of the Agua Fria River. Completes the grid in this area, but is a major bridge and an expensive project that will need to be further analyzed.
- Many new arterials in the west and north areas of the study area to accommodate new development. These are expected to be covered by stipulations and development fees as development proceeds.
- ITS Enhancements - Arterials include a cost factor (\$100k/mile) to cover ITS improvements in the expansion of the system. Emphasis would be placed on funding the arterials identified in the MAG ITS Strategic Plan, but cost factor would be added to all arterials for estimating purposes.

Figure 28: Future Base Network

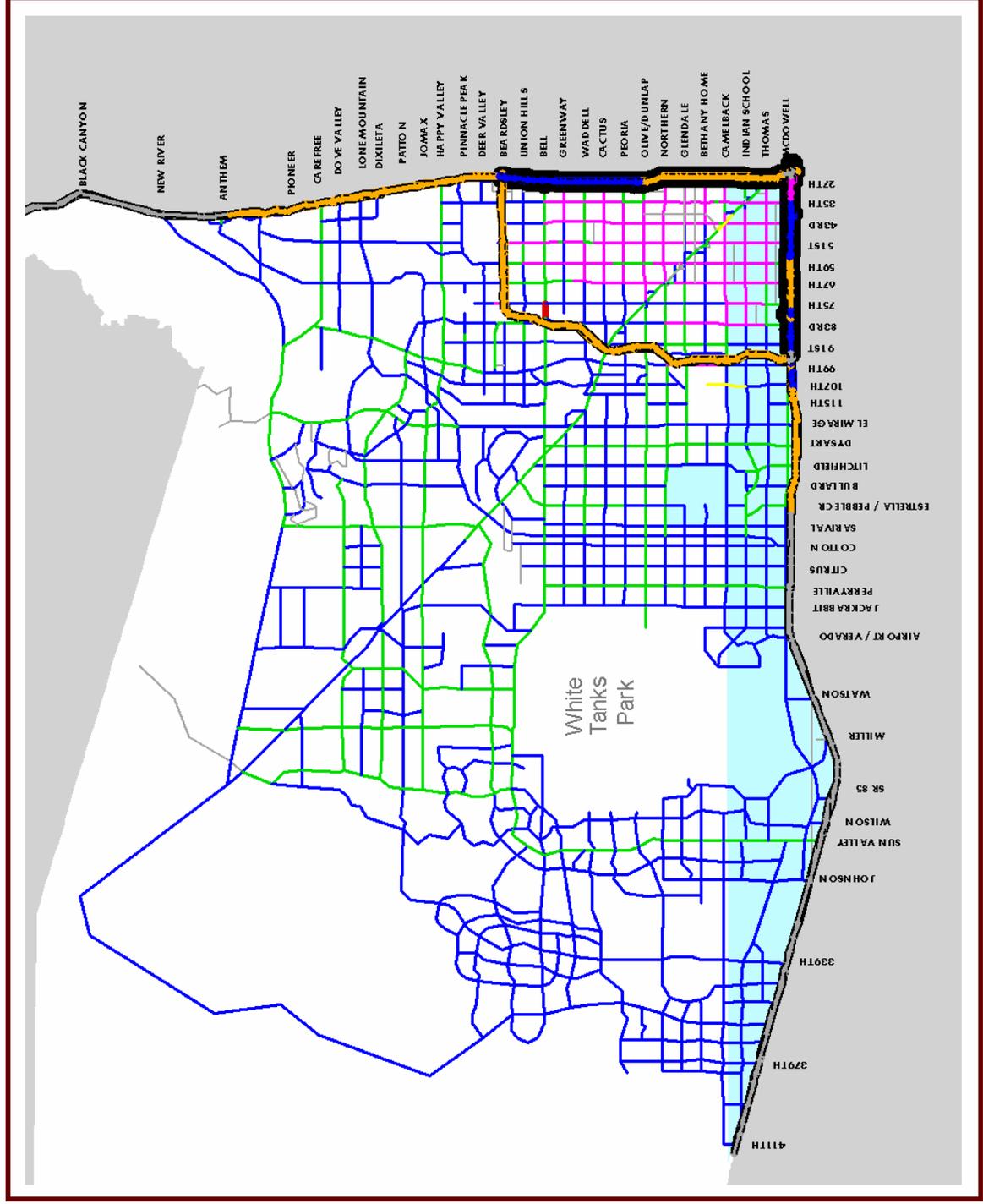


Table 19: Future Base Centerline Lane Miles and Lane Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	40	186	44	203
BUCKEYE	191	809	524	2,187
EL MIRAGE	35	175	31	153
GLENDALE	206	953	306	1,424
GOODYEAR	47	223	78	357
LITCHFIELD PARK	13	56	22	103
PEORIA	221	984	311	1,404
PHOENIX	380	1,654	432	1,843
SURPRISE	160	755	409	1,922
TOLLESON	9	43	4	17
WICKENBURG	18	73	35	139
YOUNGTOWN	6	26	8	35
MARIC CO	1,039	4,539	161	689
TOTAL	2,364	10,476	2,364	10,476
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeway			113	603
HOV			25	50
Arterial			2,226	9,823
TOTAL			2,364	10,476

Future Base Network Costs

The total cost of expanding the arterial network to improve the integrity of the grid and provide for future development adds to over \$4 billion. Much of this cost is expected to be borne by development, particularly in the outer reaches of Buckeye, Surprise and Peoria.

Table 20: Future Base Network Improvement Costs

Element	Centerline Miles Added	Cost (Millions)
Freeway Widening	25	\$200
Arterial Widening	88	\$396
<i>New Arterials</i>		
4 Lanes	890	\$2,670
6 Lanes	234	\$936
River Crossings		\$50
TOTAL		\$4,252

Figure 29: Future Base Network: 2020 Volumes

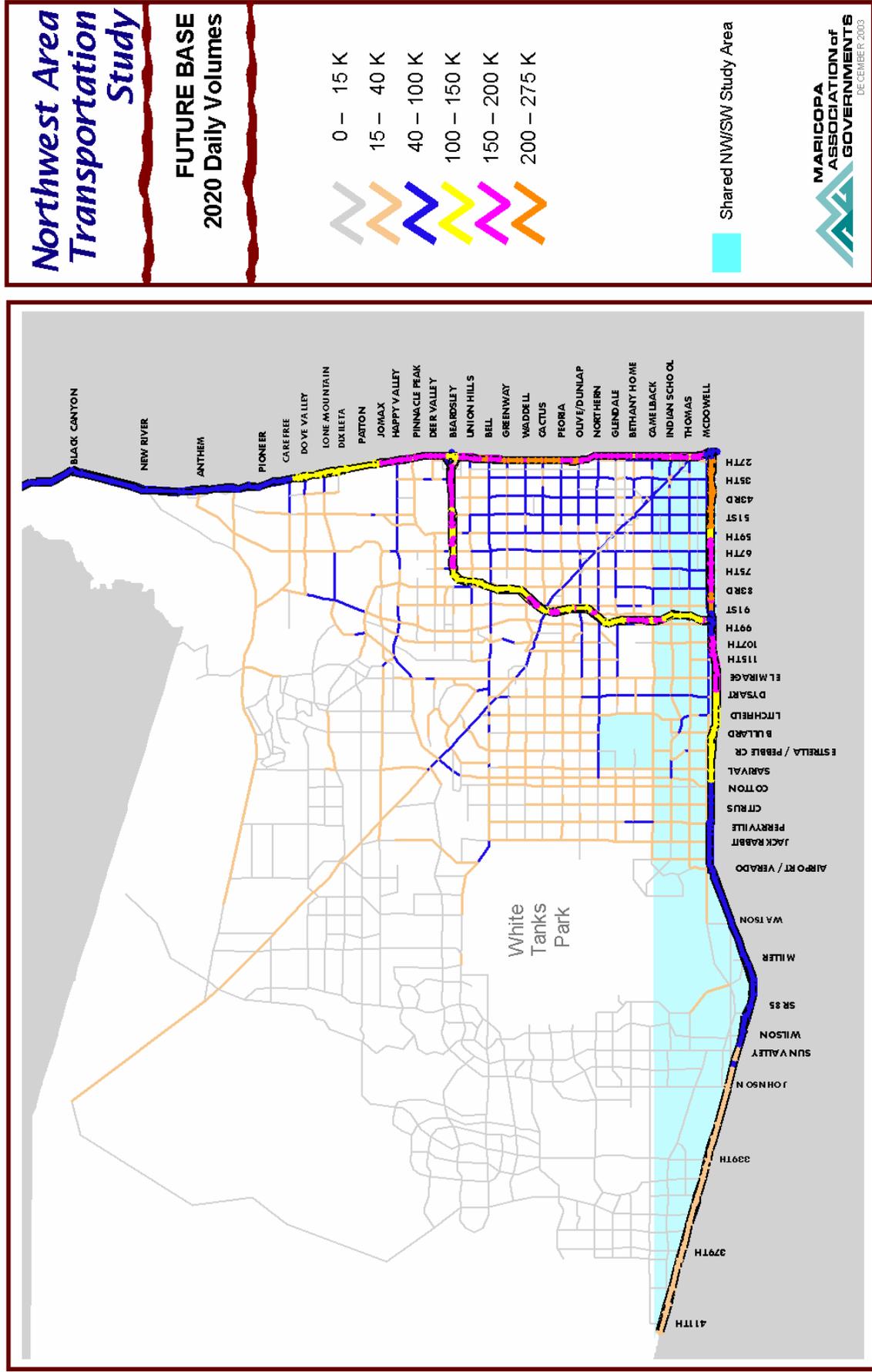
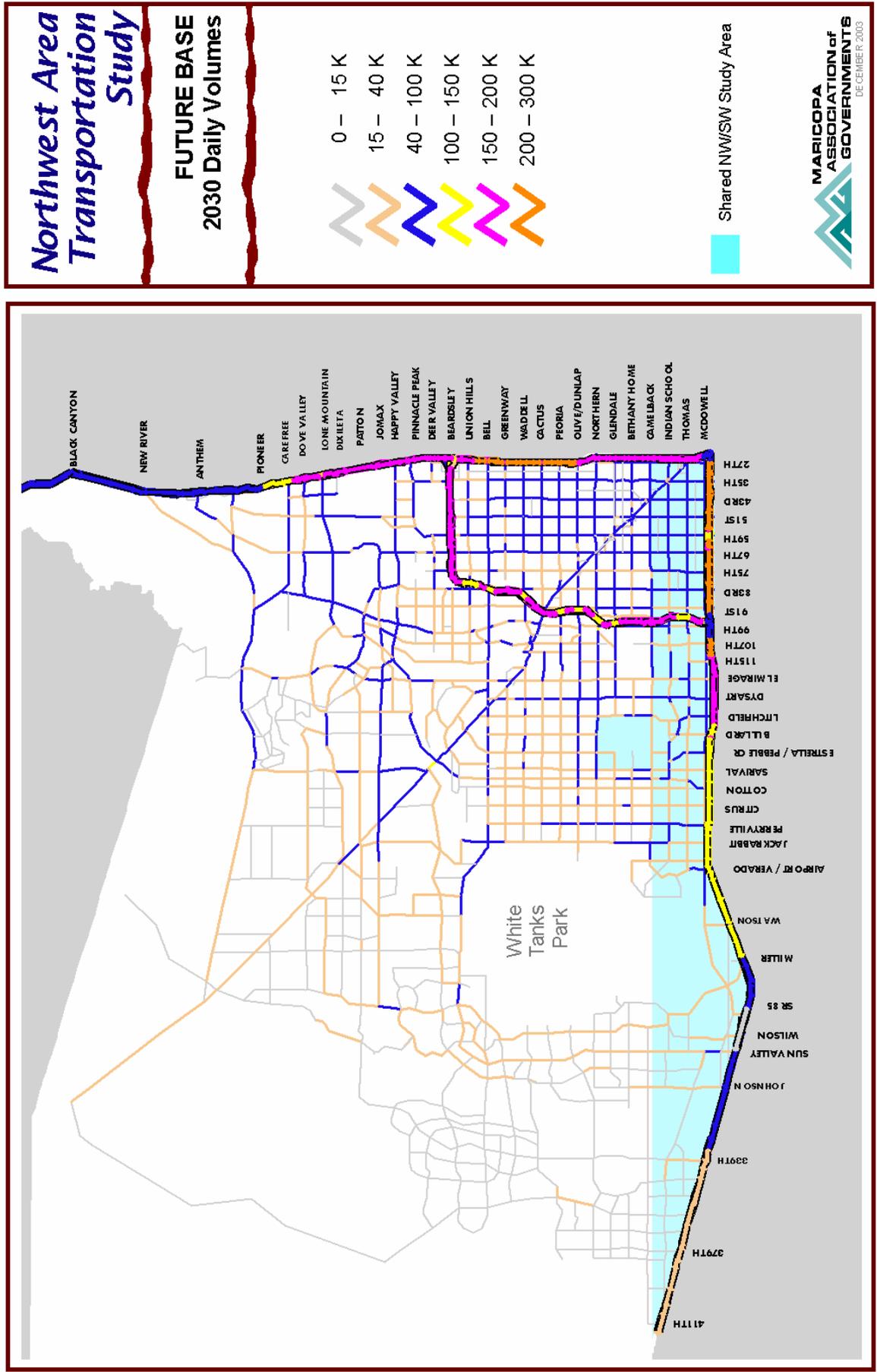


Figure 30: Future Base Network: 2030 Daily Volumes



7.2.2 Future Base Network Level of Service

As evidenced in the level of service maps that follow, the arterial network becomes a very congested system in later years even with the construction of major new facilities. The bottom line is the arterial network must be strengthened where it can to support the new freeways and expressways. The area contained within the Loop 101, I-17 and I-10 is

the most challenging in terms of future conditions. Programs such as Glendale's GO Glendale will become critical to maintaining a reasonable level of service on the primary system of vehicular travel in the transportation network. Future funding sources will need to be available to make similar improvements to the arterial network as growth in the area continues.

Figure 31: Future Base Network: 2030 Freeway Level of Service

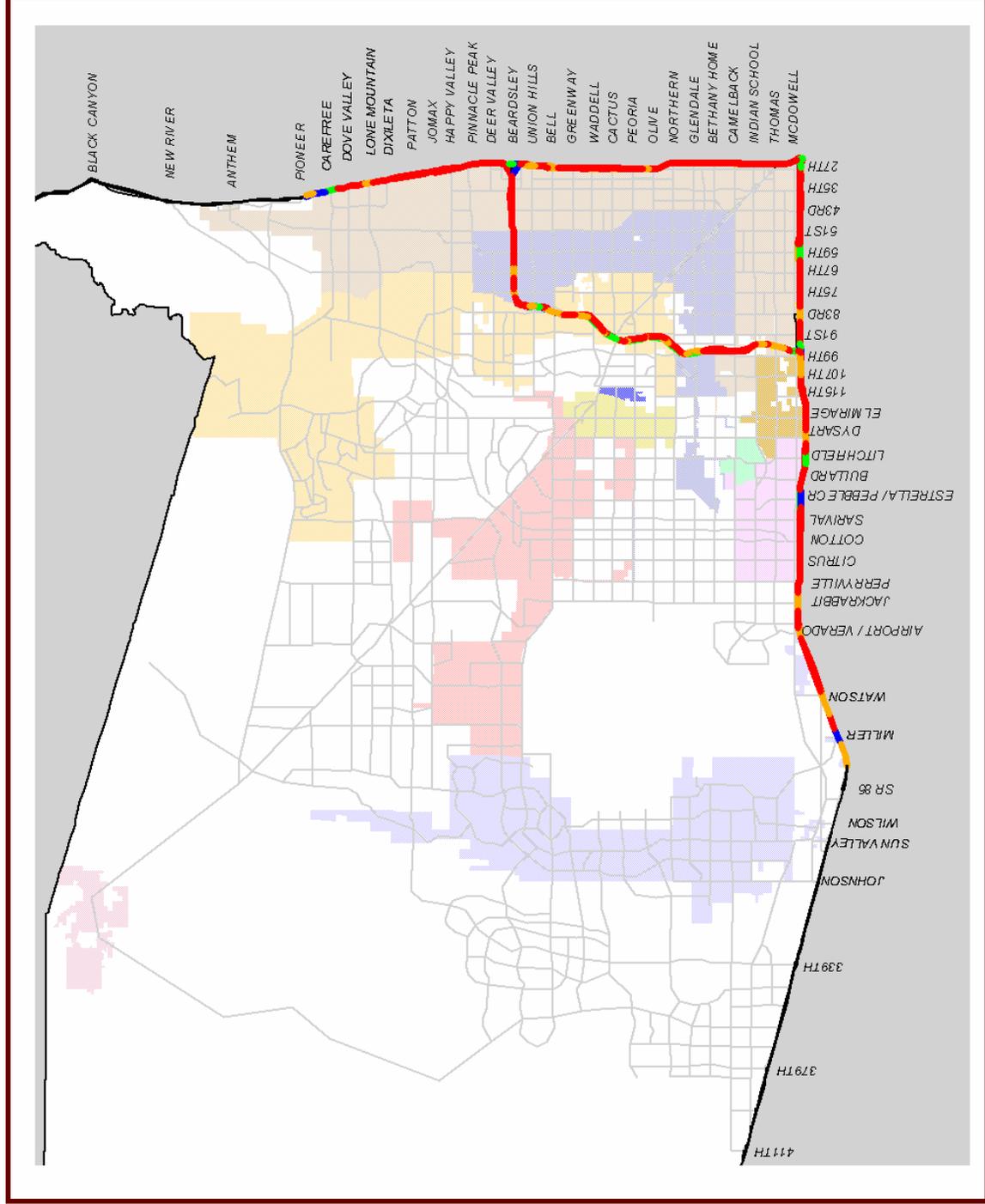


Figure 32: Future Base Network: 2030 HOV Level of Service

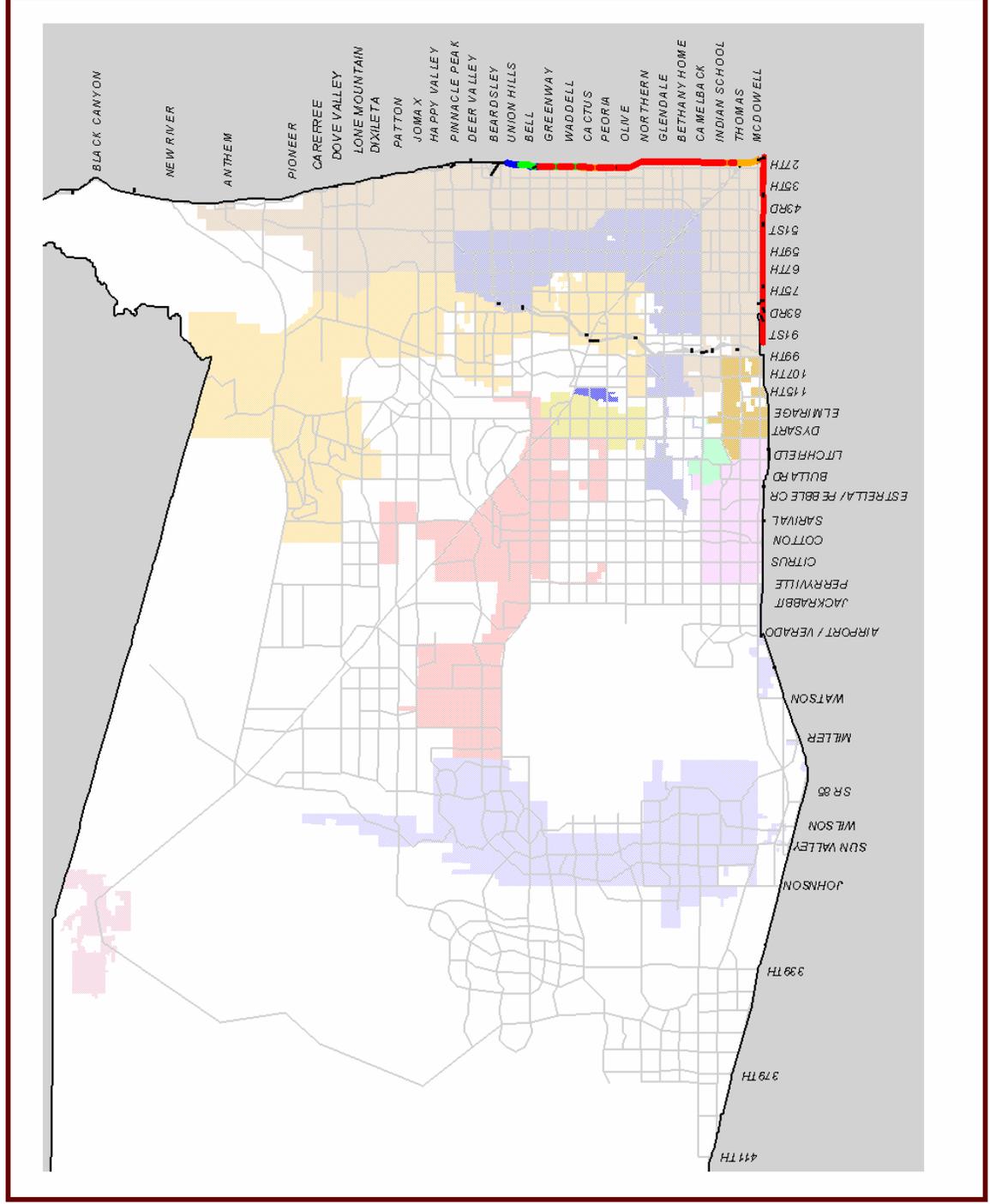


Figure 33: Future Base Network: 2030 Arterial Level of Service

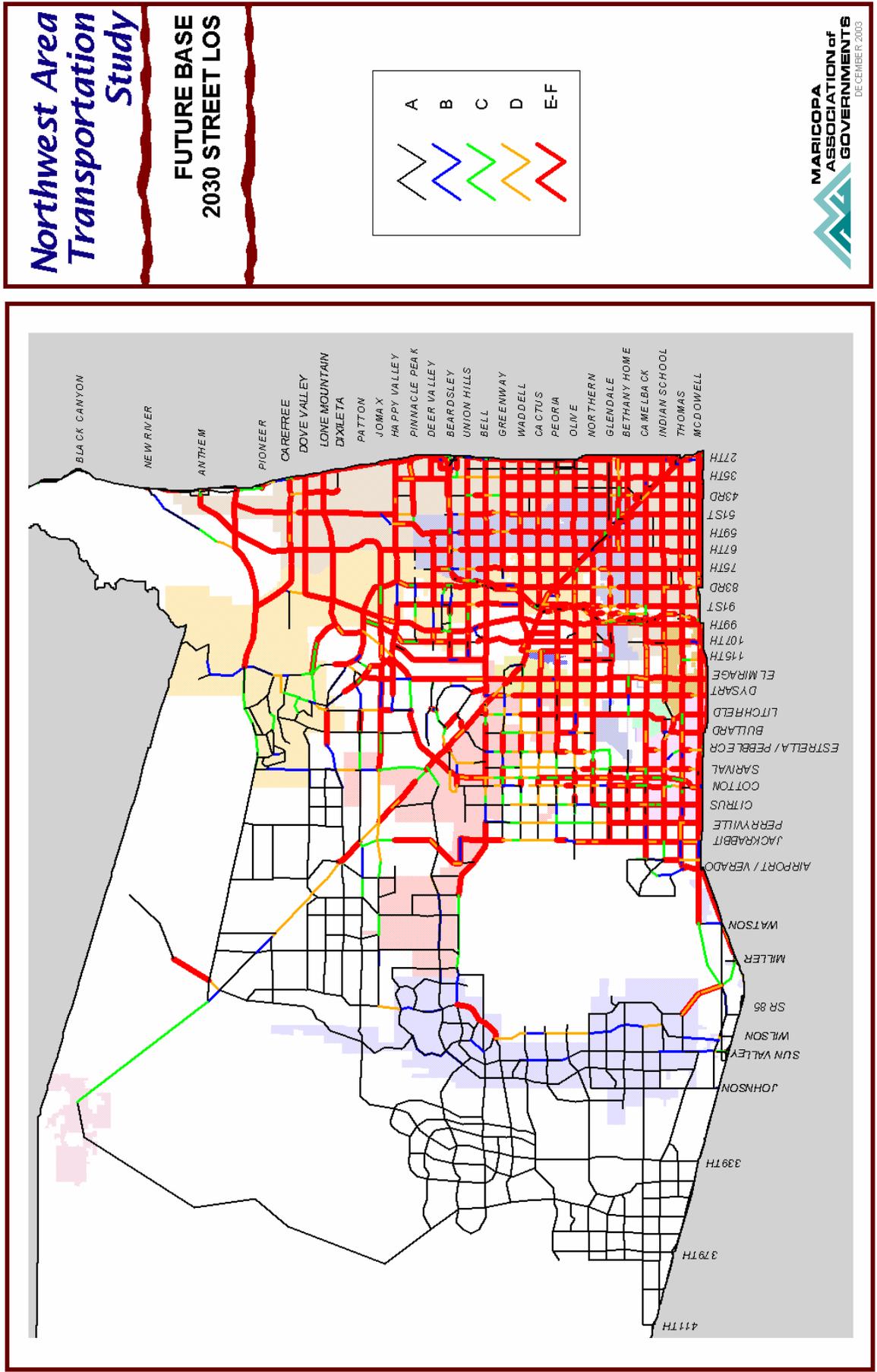
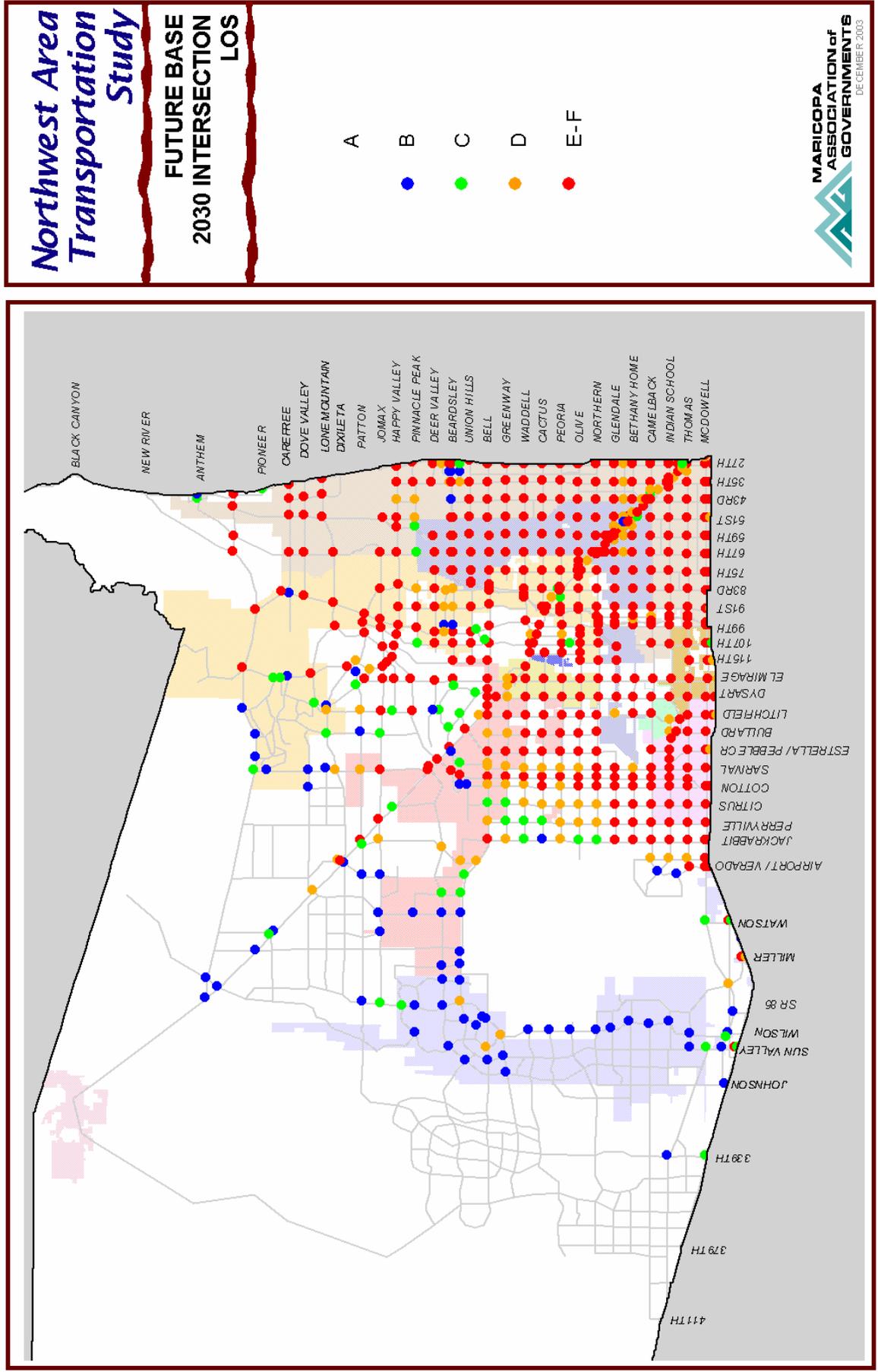


Figure 34: Future Base Network: 2030 Intersection Level of Service



7.3 Enhanced Corridors Scenario

The premise of this option is to evaluate the effectiveness of improving the functionality of existing freeways by adding lanes or interchanges at critical locations and improving arterials where they can be modified to provide a higher level of service. A key element of the Enhanced Corridors package is the build-out of regional freeways to maximum capacity within right-of-way and structural limitations, based on an assessment of build-out capacity developed for the MAG Bottleneck Study that is underway concurrently.

Among the types of projects included in the Enhanced Highways Package are the Northern Avenue Superstreet (shown as a partially access-controlled limited expressway in Figure 35) identified in Glendale's Transportation Plan and the improvement of Grand Avenue to an enhanced arterial between Loops 101 and 303 and as a limited expressway between Loop 101 and I-17. The Enhanced Roadway options will also show the addition of new general purpose and HOV lanes to I-10, I-17, and Loop 101. All existing freeways are shown with additional lanes. I-17 has been tested in a variety of configurations, but is shown in the map below with only 3 general purpose lanes and an HOV lane from I-10 to Dunlap Road. It widens to 4 lanes and an HOV lane from Dunlap to Loop 101 and to 5+1 north of Loop 101 to Anthem.

I-10 also receives additional lanes (both general purpose and HOV) to handle rapidly increasing demands from the West Valley. The segment from I-17 to Loop 101 is

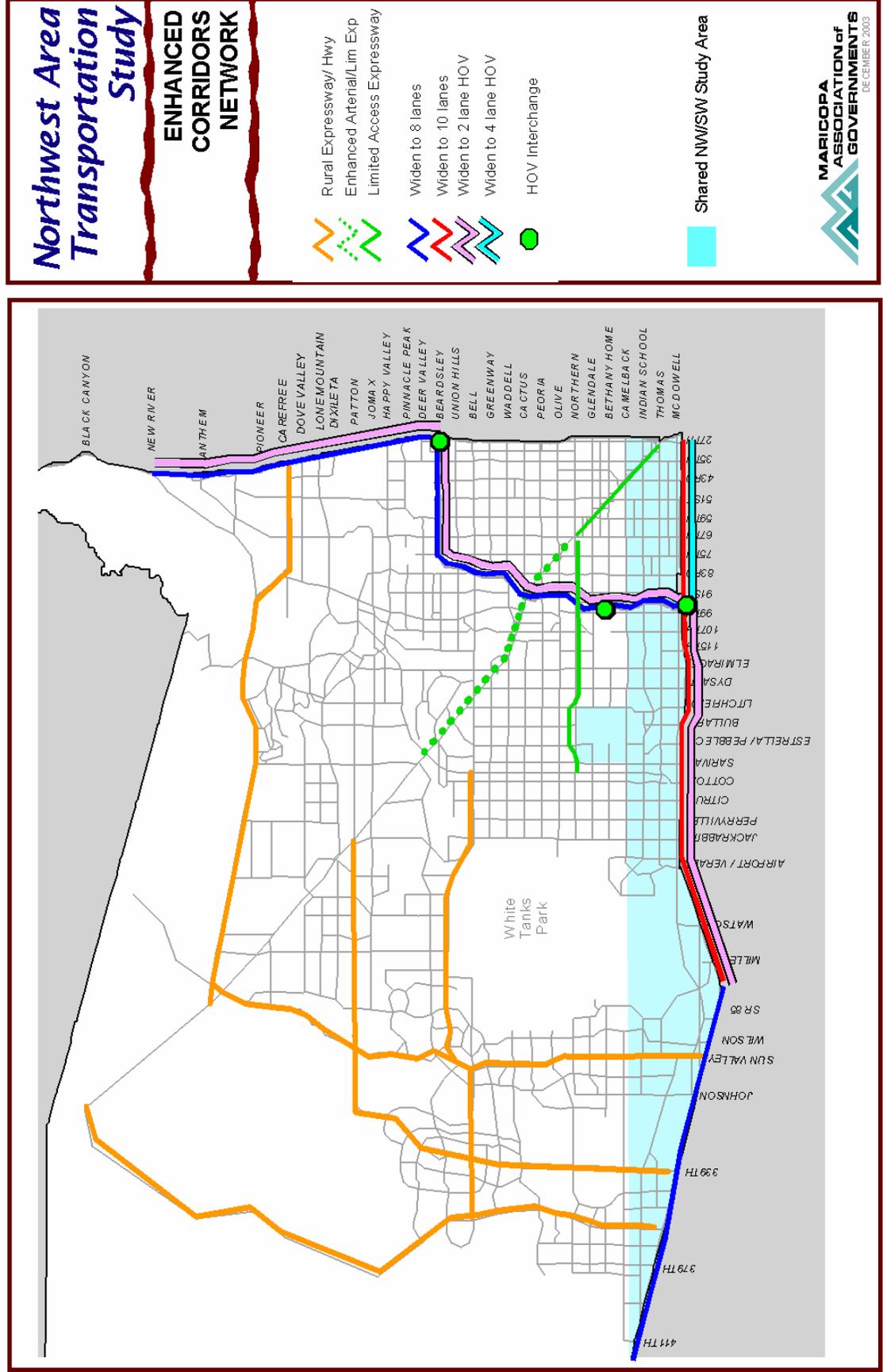
widened to 5 general purpose lanes and the associated HOV facility to two lanes each way. From Loop 101 west, the I-10 freeway is widened to four general purpose lanes and a single HOV lane each way. The HOV lane extends to SR 85. The four general purpose lanes reach to 411th Avenue.

HOV lanes can be used for carpools, BRT or other transit services. Special HOV interchanges at key system locations are also introduced at appropriate locations to further enhance the regional utility of the HOV system. The proposed Maryland Avenue partial interchange at Loop 101 in the vicinity of the new sports stadiums in Glendale is a good example of another special purpose HOV facility.

7.3.1 Arterial Roadway Corridor (ARC)

While the emphasis is on improved freeway or "freeway-like" elements, it is also appropriate to test the functionality of key arterials or "enhanced arterials" where they can contribute to regional mobility. The ARC designation (also "rural expressway") in this modeling package was also given to some remote facilities where it is intended to offer opportunities to widen these roadways if needed, but also to protect rights-of-way and scenic value where they apply. Key roadways such as US 60, SR 74, CANAMEX, Sun Valley Parkway and others in the outlying areas may not require more than four lanes for a long time, but the option to expand them to even six lanes must be protected from encroachment and excessive access if they are to maintain their status in the network over time and continue to move people efficiently.

Figure 35: Enhanced Corridors Network



7.3.2 Key Additions in Enhanced Corridors Scenario:

- **I-17 (I-10 to Loop 101)**

- Dunlap to 101: widen to 4 + 1 lanes each way
- Dunlap to I-10: 3 + 1 lanes each way (existing)

This stretch of I-17 is subject to very heavy traffic volumes already, which will only increase in the future. The freeway would require substantially more lanes than are possible given existing right-of-way and structural limitations. Though only a single additional lane for one section is proposed here given space limitations, the need for capacity along this corridor goes well beyond an additional lane of demand. Furthermore, there will be a growing bottleneck as the number of lanes south of this improvement remains constrained to three general purpose and one HOV.

The New Corridors scenario, reviewed later, tests additional options for providing substantial additional capacity along I-17 between Loop 101 and I-10.

Model projections indicate that this segment is expected to carry well over 200,000 vehicles in the Enhanced Corridors condition. That represents a LOS of “F” on a highway designed for 165,000. Potential alternatives are expensive, e.g., double-decking the freeway and dedicating lanes for special purpose other than HOV (e.g., truck lanes, through lanes, etc.).

- **I-17 (north of Loop 101)**

- Widen to five lanes each way and addition of an HOV lane from Loop 101 to Carefree Highway.

- Widen to four general purpose lanes and one HOV from Carefree Highway north to New River.

In this portion of I-17, additional lanes to accommodate future growth can still be provided. The need for five lanes reflects not only the need for freeway capacity as development moves north, but the limitations of the adjacent arterial system as a result of topographic and land use obstructions. An HOV lane would also serve to encourage ridesharing and transit usage in the area as those services expand to the northern reaches of the valley.

- **I-10 (I-17 to Loop 101)**

- Widen to 5 lanes each way and 2 HOV lanes each way.

In the year 2030, as indicated in model runs, traffic volumes in this scenario are expected to grow to 320,000, with LOS F as far west as Loop 101. The current capacity of approximately 200,000 will be overwhelmed well before that time. There is available space for one general purpose lane and one HOV lane in each direction.

- **I-10 (Loop 101 to SR 85)**

- Widen to 4 lanes each way and extension of HOV lane.

The addition of 2 more lanes in each direction (including an HOV lane) west of Loop 101 can be accommodated without major impact to adjacent property, but in addition to property costs and mainline construction, it would require significant modifications to freeway interchanges and structures. Projected traffic volumes are expected to be as high as 180,000.

- **System HOV interchanges at I-17/Loop 101, I-10/Loop 101**

To strengthen the appeal of the HOV system, freeway to freeway interchanges are proposed for the Loop 101 at both I-10 and I-17. The free flow from one HOV lane to another will help encourage use and minimize the merging now required when the HOV lanes terminate.

- **HOV interchange at Maryland/Loop 101**

This new facility will offer direct access from the Loop 101 to the new football stadium and hockey arena in Glendale as part of the freeway HOV plan.

- **Northern Avenue Superstreet – Grand Avenue to Loop 303**

There is limited east-west capacity in the Northwest Valley. There are few major roadways in place between Bell Road and I-10 that can accommodate major traffic flows. The City of Glendale has identified Northern Avenue as a “super-street” for the purpose of improving the east-west connectivity in the area. The exact definition of the Superstreet is not yet complete, but it is expected to consist of at least six lanes, additional access control and at least some grade separated interchanges to aid traffic flow.

Because the concept for the roadway design is not yet defined, its implications for pedestrians and bicycles are also not yet understood, nor are its safety implications. For purposes of this document, a superstreet will be assumed to consist of *“six to eight lanes (three to four in each direction), limited access to adjacent land uses, no on-street facilities for bicycles and pedestrians, express bus/BRT only transit provisions and a strong emphasis on roadway throughput*

capacity enhanced by extensive use of intelligent transportations systems.”

The application of such a facility in mature areas must address the issues of how travel patterns may change and what effect those changes can be expected to have on safety and local circulation and access. If changes are significant, they will also need to be provided for in the design of the roadway.

- **Grand Avenue – Limited expressway from Loop 101 to I-17**

The limited expressway portion of Grand Avenue complements Northern Avenue as a key regional link designed to assist traffic through one of the most congested areas in the Valley. Some sections of Grand Avenue south of Loop 101 will be improved via the addition of grade separations and will operate more as an expressway than as an arterial. The remaining sections will continue to operate primarily as arterials.

- **Grand Avenue – Enhanced arterial from Loop 101 to Loop 303**

This was the subject of a recently completed MAG Grand Avenue Corridor Northwest Study which proposes bolstering the capacity of Grand Avenue to accommodate higher volumes as growth moves toward the Northwest. It includes grade separations at key locations (i.e., El Mirage Road, Meeker/Reems Roads and 103rd Avenue), extension of ITS along Grand Avenue to as far north as Loop 303, and widening to provide better and more predictable lane configurations throughout. Access control is to be improved to the extent acceptable to local jurisdictions.

- **Expressway/Arterial Roadway Corridor (ARC)**

This category does not have a specific definition as yet and cost reflects only the additional right-of-way required assuming a freeway/expressway right of way. It is shown as a means to encourage discussion about how to protect outlying roadways from encroaching development while the opportunity is still available. The protected space could be set aside for additional capacity, should it be needed, or as a scenic or urban buffer to protect viewsheds and establish credible setbacks from the road. It would be at least partially access controlled. For modeling purposes, these facilities were assumed to be expressway.

7.3.3 Enhanced Corridors Improvement Costs

The Enhanced Roadway plan is the most costly of all scenarios tested at about \$2.5 billion. It includes some of the most extensive freeway and HOV lane widenings as well as major arterial special projects such as Grand and Northern Avenues. Enhanced projects are, for the most part, “retrofit projects” and

impact existing land uses, rights-of-way and multiple cross streets which are typically very expensive to negotiate. On the other hand, these projects are among the most important in terms of their congestion mitigation benefits to the roadway system and must be considered high priorities.

The challenge will be to balance the funding of the enhancements against the need for providing a solid base network and the desire for many of the projects in the New Corridors plan.

7.3.4 Enhanced Corridors Level of Service

Though the addition of the new capacity of the Enhanced Corridors helps to mitigate some of the congestion in the Base Network, much of the system still operates at an unacceptable level of service overall. The amount of new capacity provided in this option makes a noticeable improvement, but requires yet further improvements to eliminate problems on key Corridors. Even newer areas such as Northeast Phoenix and areas west of Loop 101 still show significant congestion in 2030.

Table 21: Enhanced Corridors Centerline Miles and Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	30	141	34	154
BUCKEYE	146	615	400	1,662
EL MIRAGE	26	133	24	116
GLENDALE	157	724	234	1,082
GOODYEAR	36	169	59	271
LITCHFIELD PARK	10	43	16	78
PEORIA	169	748	237	1,067
PHOENIX	290	1,257	330	1,401
SURPRISE	122	574	312	1,461
TOLLESON	7	33	3	13
WICKENBURG	14	56	26	106
YOUNGTOWN	5	20	6	27
MARIC CO	793	3,449	123	524
TOTAL	1,805	7,961	1,805	7,961
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeway			135	710
HOV			27	54
Arterial			1,643	7,197
TOTAL			1,805	7,961

Table 22: Estimated Cost of Enhanced Corridors Improvements

Element		Lane-Miles Added	Avg. / High 2030 Volume (Thousands)	Number of Lanes Needed	Cost (Millions)
I-10	General Purpose	137	212 - 320	4 to 5	\$880
	HOV	60	10 - 32	1 to 2	\$320
I-17	General Purpose	68	170 - 290	3 to 5	\$272
	HOV	34	8 - 23	1	\$102
Loop 101	General Purpose	44	196 - 240	4	\$176
	HOV	44	4 - 12	1	\$215
Grand Avenue		22	48 - 82	6	\$314
Northern Avenue		13	79 - 132	6 to 8	\$216
Rural Highways		152 (ROW only)	-	2 to 4	\$608
Total					\$3,103

Figure 36: Enhanced Corridors: 2020 Traffic Volumes

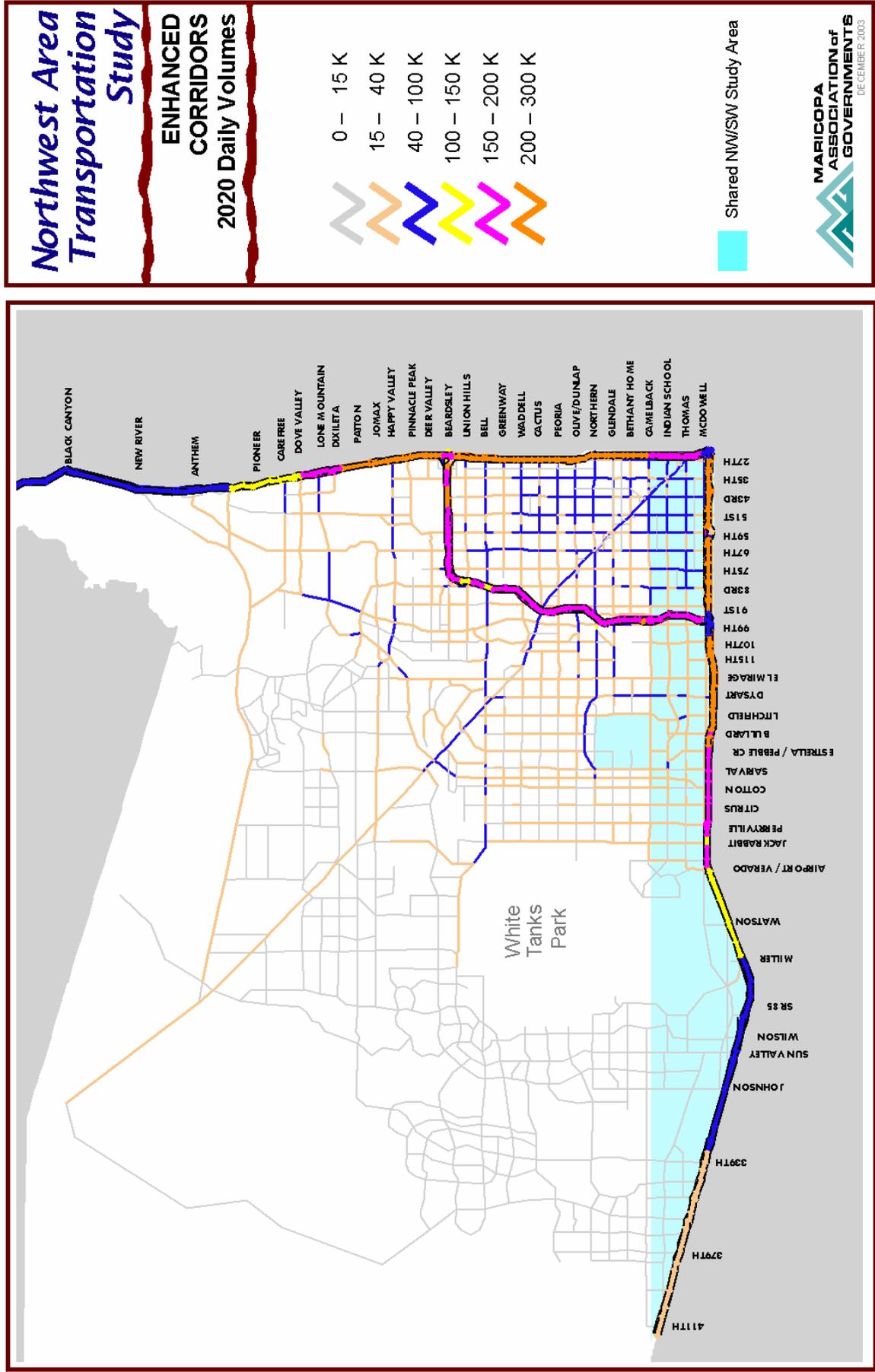


Figure 37: Enhanced Corridors Network: 2030 Daily Volumes

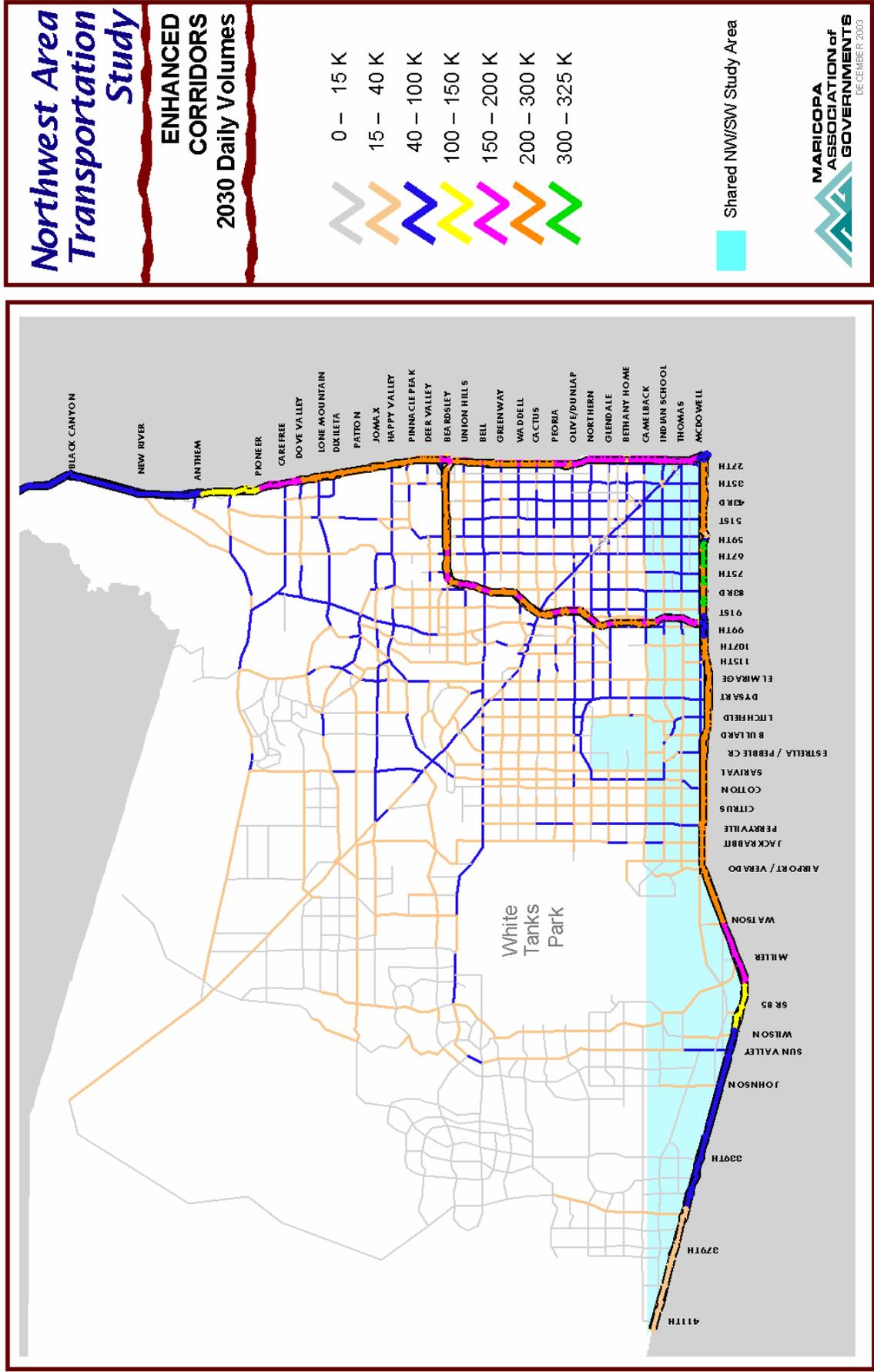


Figure 38: Enhanced Corridors Network: 2030 Freeway Level of Service

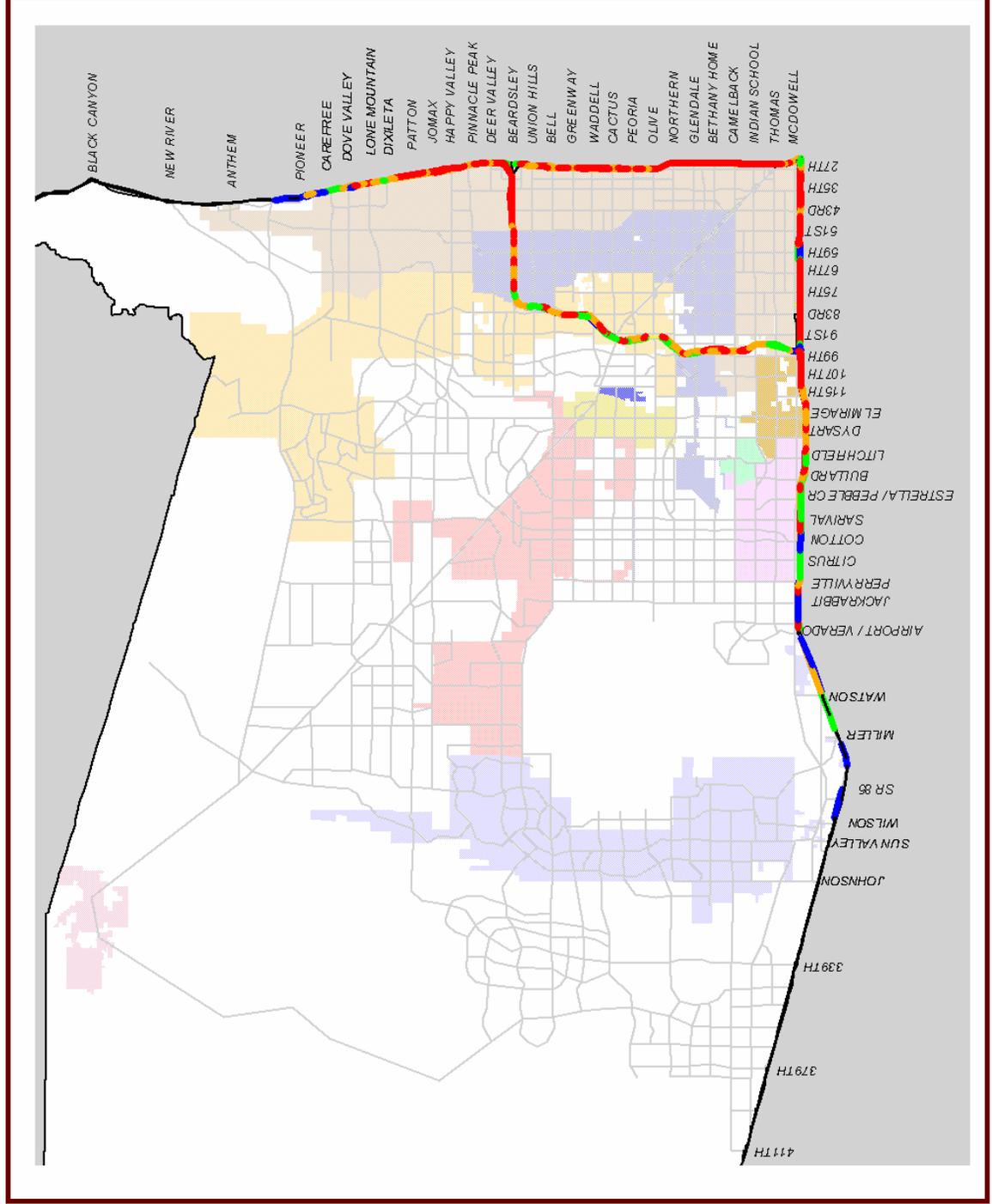


Figure 39: Enhanced Corridors Network: 2030 HOV Level of Service

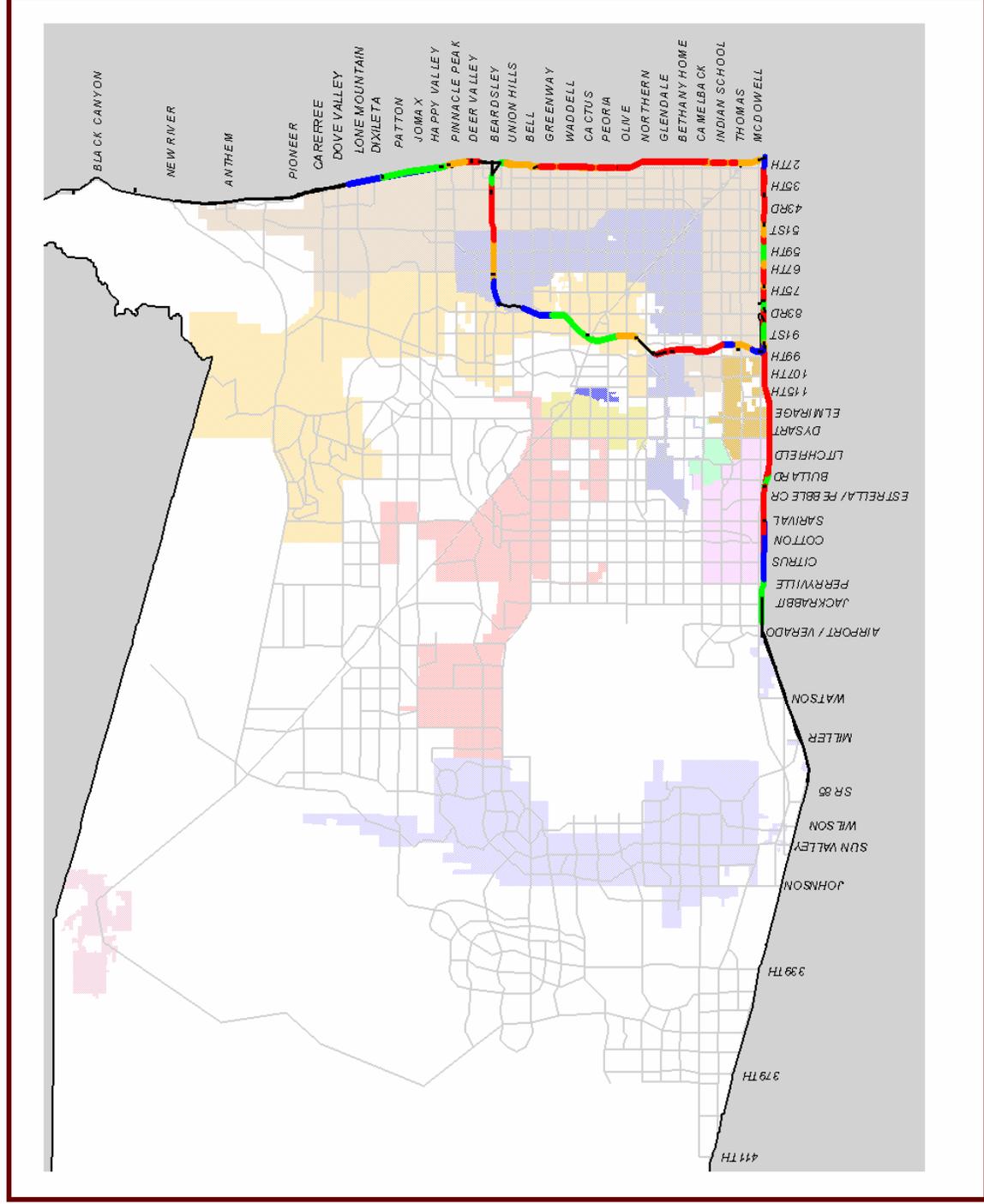


Figure 40: Enhanced Corridors Network: 2030 Arterial Segment Level of Service

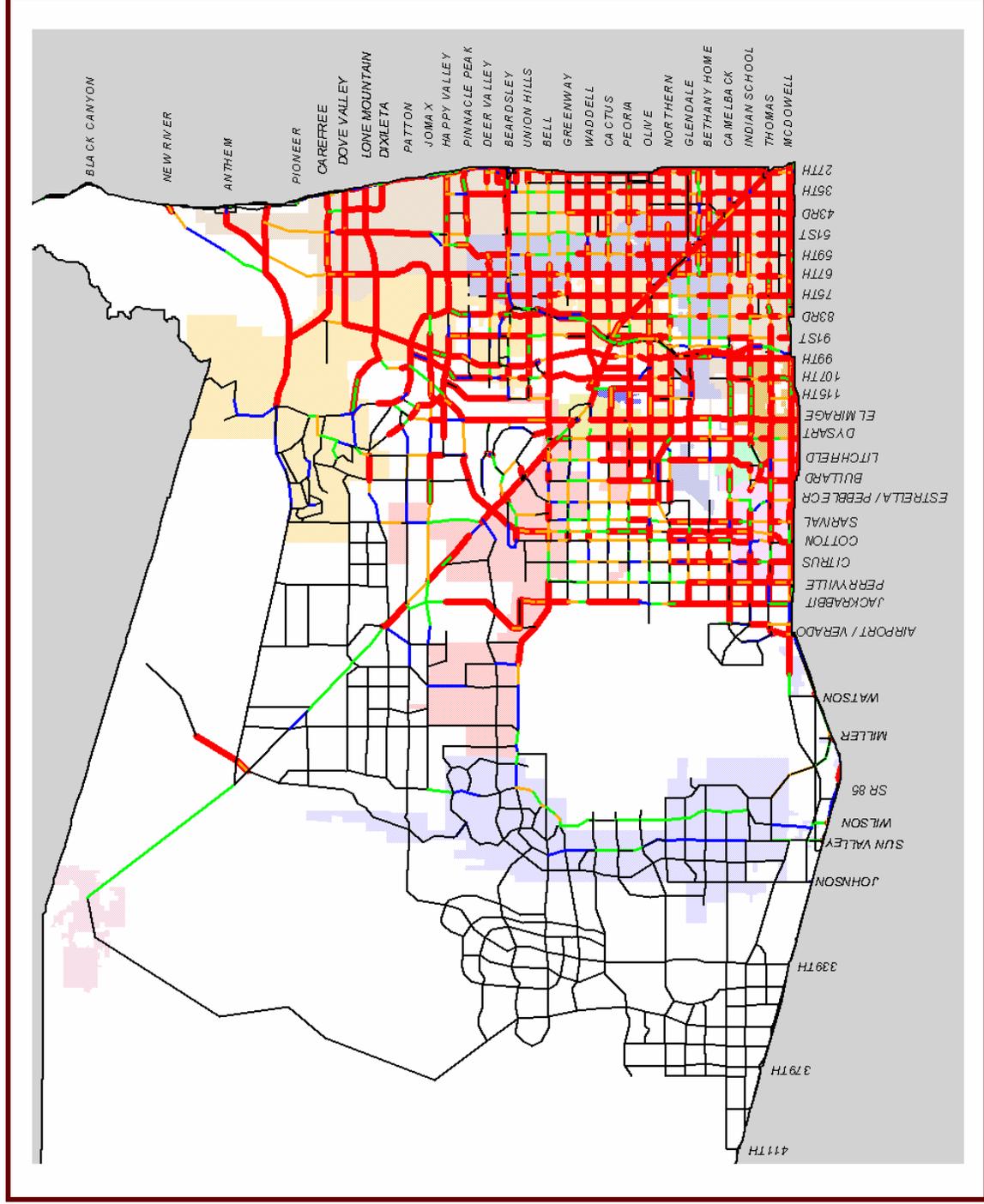
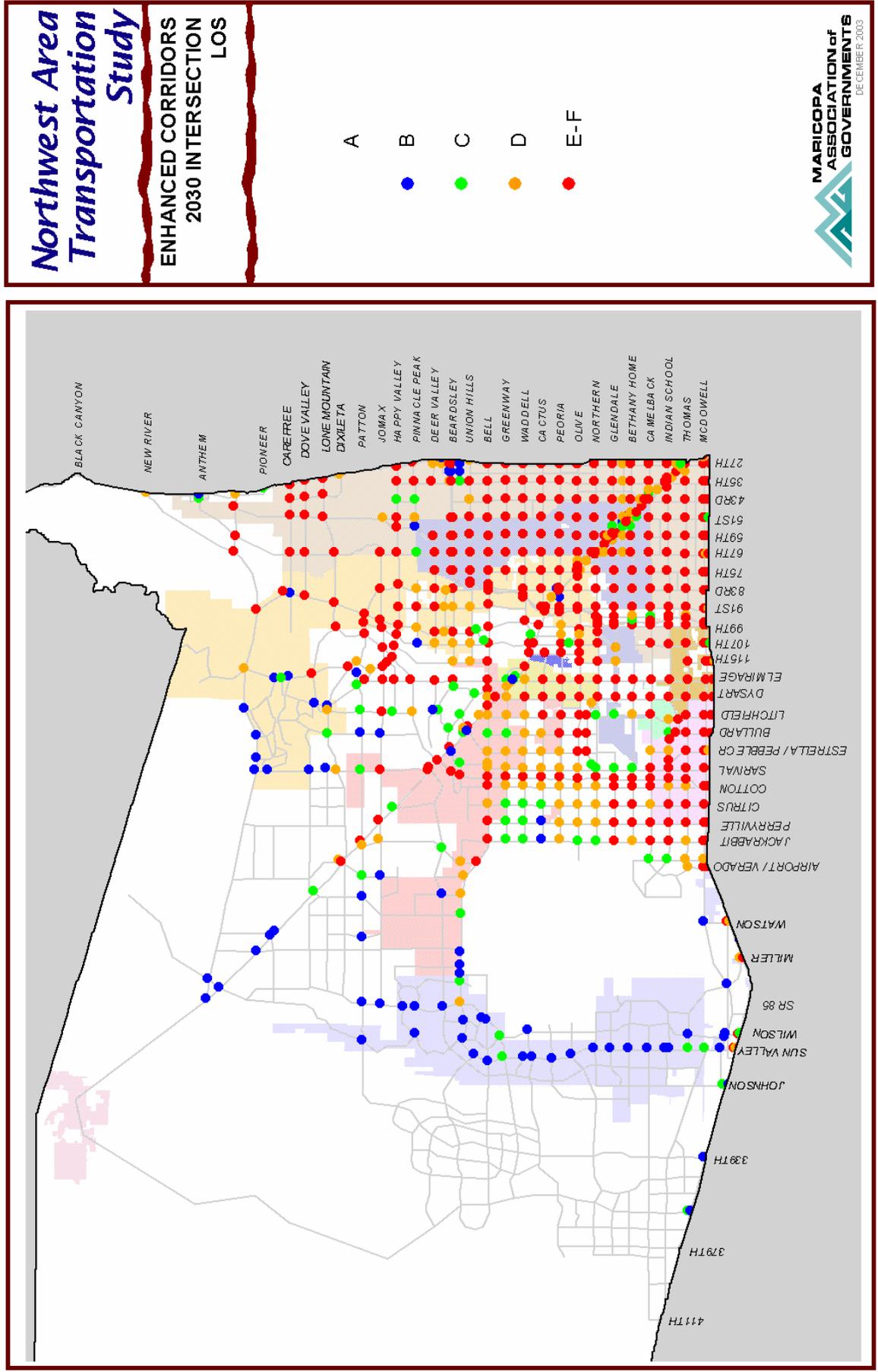


Figure 41: Enhanced Corridors Network: 2030 Intersection Level of Service



7.4 New Corridors Scenario

The New Corridors Scenario is designed to measure the effect of investing in major new freeway and expressway type facilities in the Northwest Valley. As the primary objective was to test the demand for higher capacity facilities, capacities modeled are high and are not intended necessarily to represent the capacities to be recommended. That decision depends on the demand identified and other factors including community support.

Two separate New Corridors scenarios were run, with the primary difference being the addition of capacity on I-17. Tested in these two scenarios for the Northwest were a freeway facility along the Loop 303 alignment, including a New River Road addition; an expressway connection between Loop 303 and Loop 101; an expressway connection along the Carefree Highway (SR 74) from Loop 303 to I-17; I-17 widening to twenty lanes (nine general purpose lanes and one HOV lane in each direction), from I-10 to Loop 101; and one significant new rural regional roadway, the Wickenburg Bypass from US 60 to US 93.

Loop 202 (South Mountain) was also added as a freeway (10 lanes) to the New Corridors Scenario. The South Mountain Corridor connects to I-10 within the Northwest study area, but otherwise falls outside the Northwest study area.

7.4.1 Key Additions in New Corridors Scenario

There are only a few elements in the New Corridors package, but they are significant in terms of the capacity they contribute to the plan. They are described in the following paragraphs.

- **Loop 303 Freeway from I-10 to I-17** – As a freeway in the New Corridors scenario,

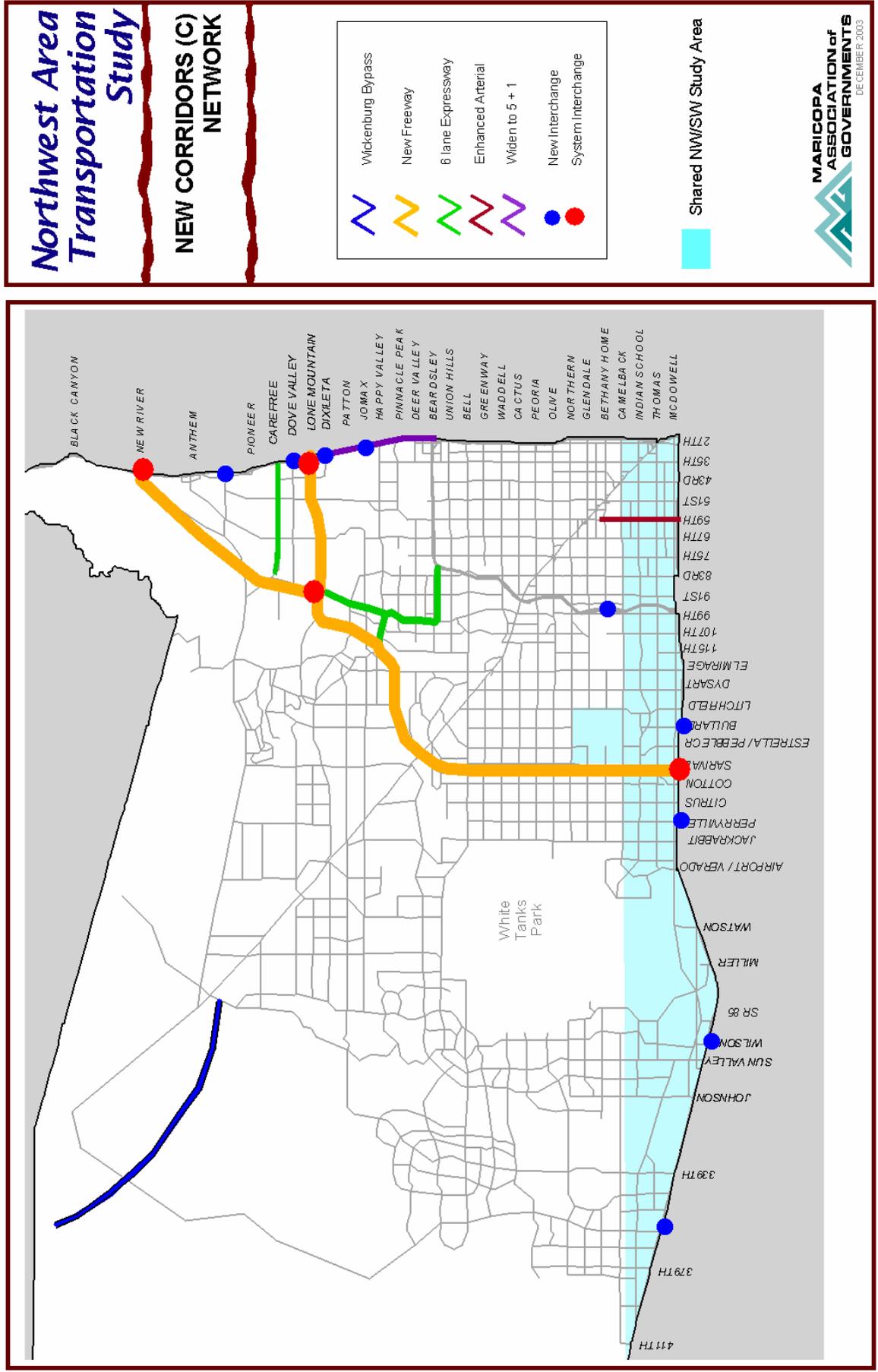
Loop 303 provides improved access to a vast area outside Loop 101 and encircles some established communities and institutions such as Sun City and Luke AFB. The exact location of portions of the roadway alignment is currently under study. The MAG Regional Council adopted a motion for the connection to I-17 in their January 2001 meeting, as follows:

“Approve the Lone Mountain Alignment as the preferred option for the Loop 303 connection with Interstate 17 in the next update of the Long Range Transportation Plan, to be constructed as a limited access parkway up to I-17 on the west side, with access only at major arterial intersections and for sufficient right-of-way to be purchased for a fully controlled access facility sometime in the future. In addition, the New River Alignment would be designated for further study in the Regional Transportation Plan.”

Consistent with the Regional Council action, Loop 303 was tested as a ten-lane freeway along the Loop 303 corridor between I-10 and I-17, connecting to I-17 along the Lone Mountain alignment and (as discussed further below) the New River Road study corridor. A system interchange was also provided for the intersection with Carefree Highway, SR 74.

- **New River Extension from Loop 303 to New River Road** – Also part of the Loop 303 discussion, the City of Phoenix has more recently indicated an interest in extending at least an arm of the proposed roadway to New River, near Anthem. It was modeled as a 10 lane facility, the same as Loop 303.

Figure 42: New Corridors (C) Network



- **Wickenburg Bypass** – A longstanding desire by the Town of Wickenburg is to eliminate commercial vehicle traffic from the historic downtown. ADOT has studied various alignments for a bypass, but a final decision has not yet been made. For purposes of this analysis, an alignment connecting SR 74 with the Bypass around the westerly side of the town was used. The Town of Wickenburg has recently indicated a preference for the CANAMEX Corridor along the Wickenburg Road/Vulture Mine Road alignment, connecting to US 93 north of Wickenburg, to be the ultimate bypass.
- **Carefree Highway Expressway** – The segment between I-17 and the proposed New River extension of the Loop 303 is expected to be subject to substantial growth. To accommodate substantial traffic volumes, this portion of SR 74 was tested as a 6-lane expressway. West of Loop 303, the roadway is identified as an ARC within a freeway right-of-way width.
- **Loop 101/Loop 303 Connector** – To address the possible implications of travel demand between the two freeways, a parkway or expressway connection was tested that would help to mitigate traffic increases and limit incursion into neighborhoods that might otherwise bear the burden of “cut through” traffic. The connection is shown in the vicinity of Beardsley Road connecting to Loop 101 and Lake Pleasant Road and Happy Valley Road connecting to Loop 303. This is the narrowest separation between the two Loop roadways where the highest propensity to “cross over” is likely to manifest itself during periods of heavy congestion.
- **59th Avenue** – This link is shown as an enhanced arterial to provide added north-south arterial capacity between I-10 and Grand Avenue. The intent was two-fold: to help eliminate the negative effects of a possible Loop 202 (South Mountain) connection to I-10 at or near 59th Avenue, and use of 59th Avenue as a higher capacity corridor consistent with alternatives tested in the MAG High Capacity Transit study. This link did not receive support from the Cities of Phoenix and Glendale.
- **I-17** – Two scenarios were modeled, designated as Option A and Option C. Under Option A, I-17 was widened to nine general purpose lanes and one HOV lane in each direction from I-10 to Loop 101. In Option C, I-17 in this section was left the same as in the enhanced corridors scenario (four plus one north of Dunlap Avenue, and three plus one south of Dunlap). In both Option A and Option C, I-17 north of Loop 101 was left the same as in the Enhanced Corridors scenario (widened to five general purpose lanes plus one HOV lane to SR 74, and widened to four general purpose lanes plus one HOV from SR 74 to Anthem Way).
- **Various freeway interchanges** – Additional freeway access points are included to better serve areas of new growth.

Table 23: New Corridors Centerline Miles and Miles by Facility Type

PLACE	Jurisdiction		MPA	
	Centerline Mi	Lane Mi	Centerline Mi	Lane Mi
AVONDALE	34	165	38	181
BUCKEYE	154	700	408	1,793
EL MIRAGE	28	151	26	134
GLENDALE	168	792	251	1,202
GOODYEAR	41	201	64	306
LITCHFIELD PARK	10	44	17	81
PEORIA	178	824	246	1,143
PHOENIX	305	1,375	355	1,565
SURPRISE	124	598	314	1,507
TOLLESON	8	41	3	17
WICKENBURG	14	58	27	109
YOUNGTOWN	5	20	6	28
MARIC CO	810	3,658	124	559
TOTAL	1,879	8,626	1,879	8,626
			STUDY AREA	
Facility Type			Centerline Mi	Lane Mi
Freeway			140	1,063
HOV			97	215
Arterial			1,643	7,348
TOTAL			1,879	8,626

Table 24: Cost of New Corridors Improvements*

ELEMENT	NEW LANE MILES ADDED	AVG / HIGH 2030 VOLUME (thousands)	NUMBER OF LANES NEEDED** (each way)	COST (millions)
Loop 303	206	217 - 250	5 (4+1)	\$1,008
New River Extension	72	77 - 132	3	\$570
59th Avenue	-	40 - 52	3 (exist.)	\$15
Carefree Highway	-	49 - 66	3	\$12
101/303 Connector	-	35 - 75	3	\$22
Wickenburg Bypass	100	Less than 10	2	\$220
New TIs I-10/I-17	-	NA	-	\$128
TOTAL				\$1,975

* Based on Option C for I-17, which is the same as the Enhanced Corridors scenario for I-17. New Corridors Option A, in which I-17 is widened substantially between Loop 101 and I-10, is discussed later.

** A minimum 4 lane cross-section (2 lanes each direction) was assumed for safety reasons.

Figure 43: New Corridors Option C: 2020 Traffic Volumes

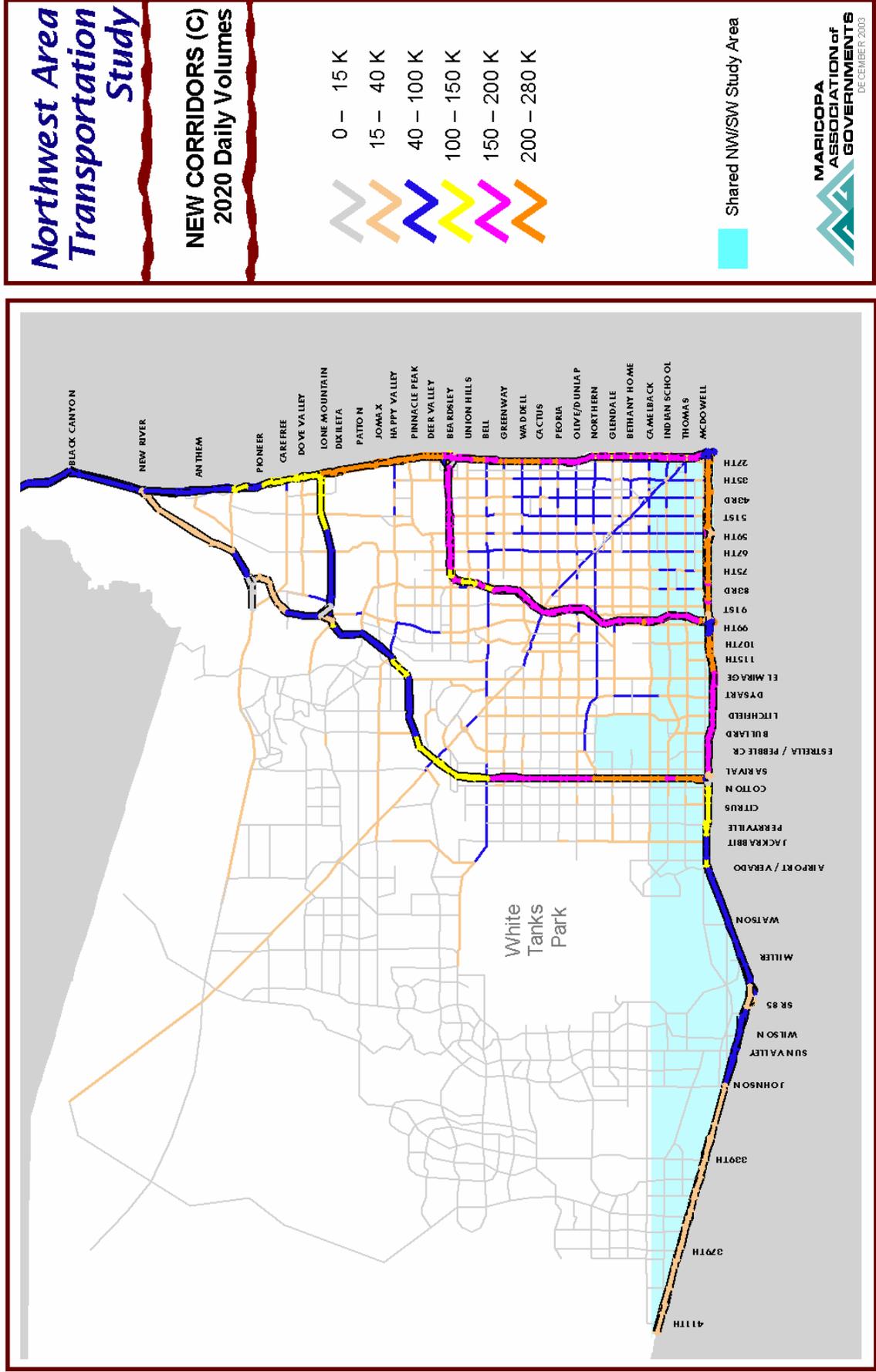


Figure 44: New Corridors Option C Network: 2030 Daily Volumes

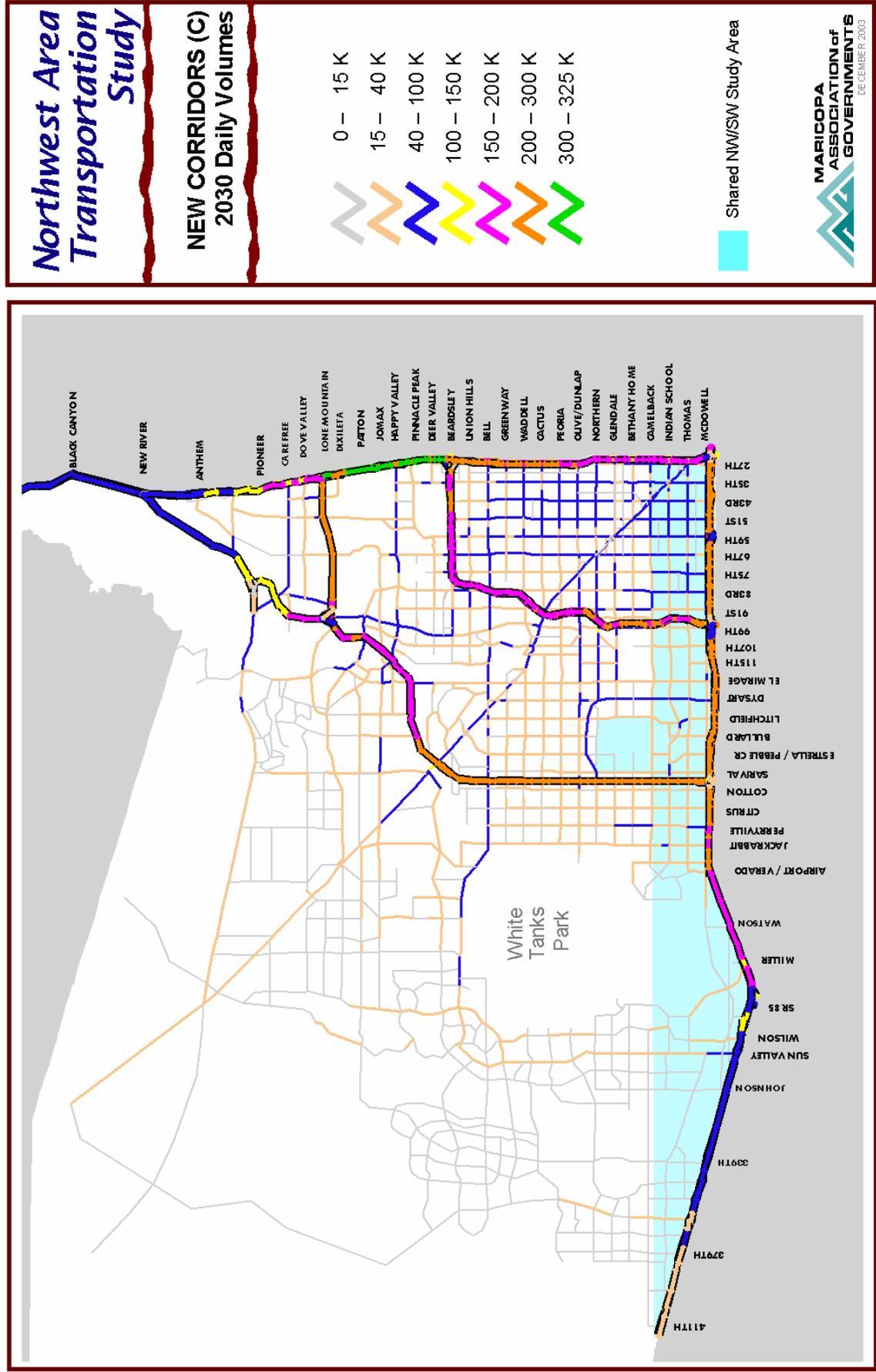
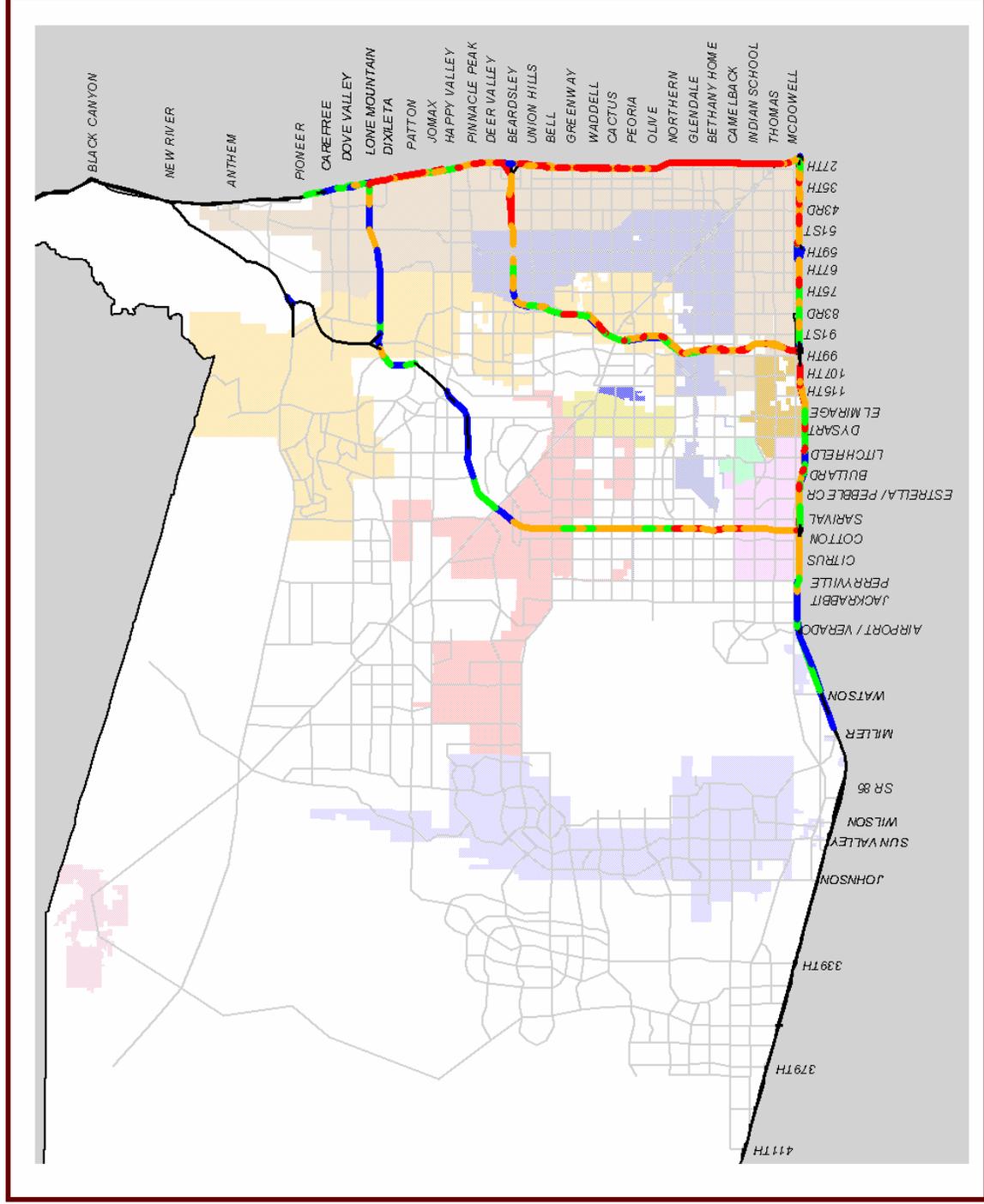


Figure 45: New Corridors Option C Network: 2030 Freeway Level of Service

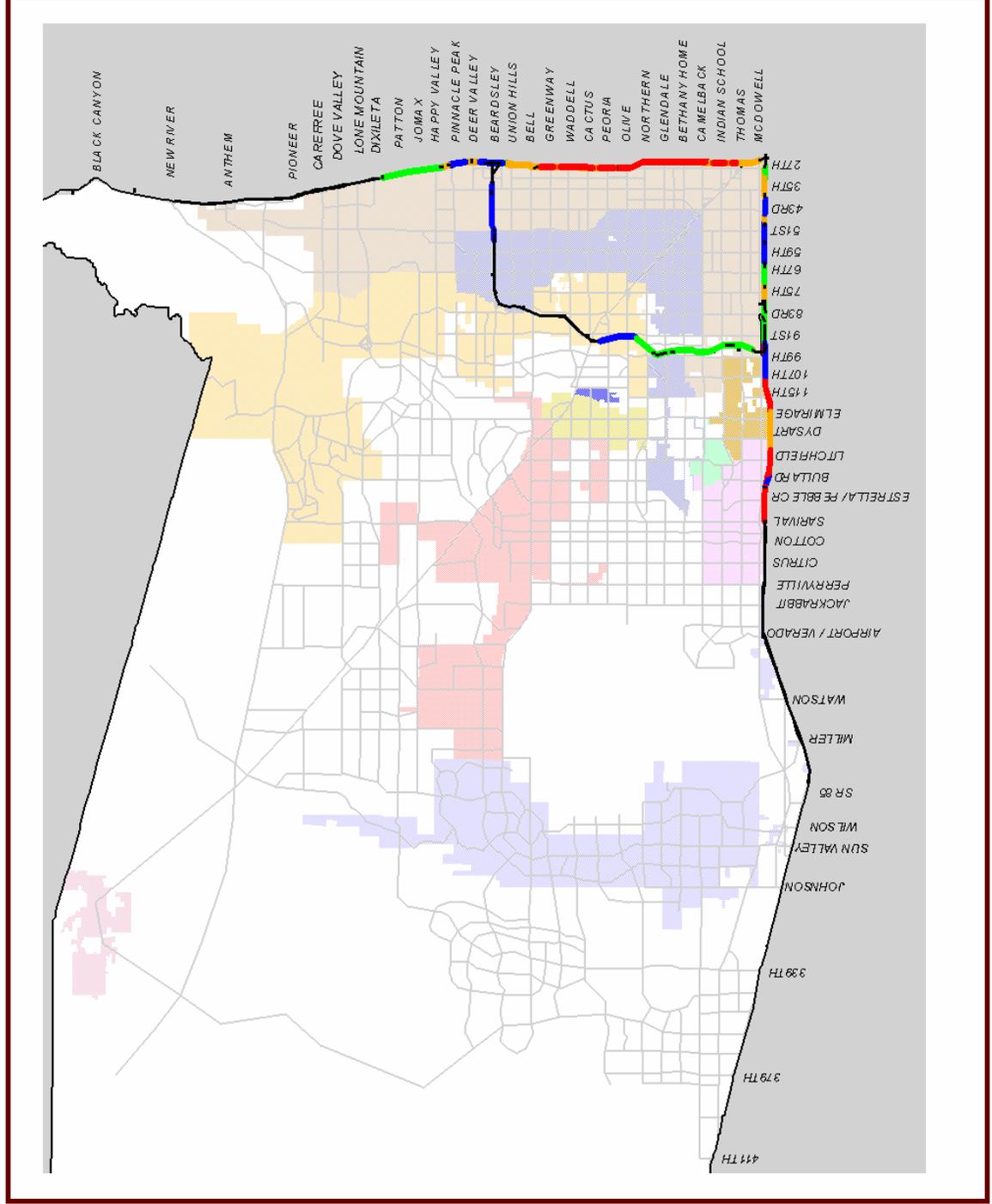


Northwest Area Transportation Study

NEW CORRIDORS (C) 2030 FWY LOS

A
 B
 C
 D
 E-F

Figure 46: New Corridors Option C Network: 2030 HOV Level of Service



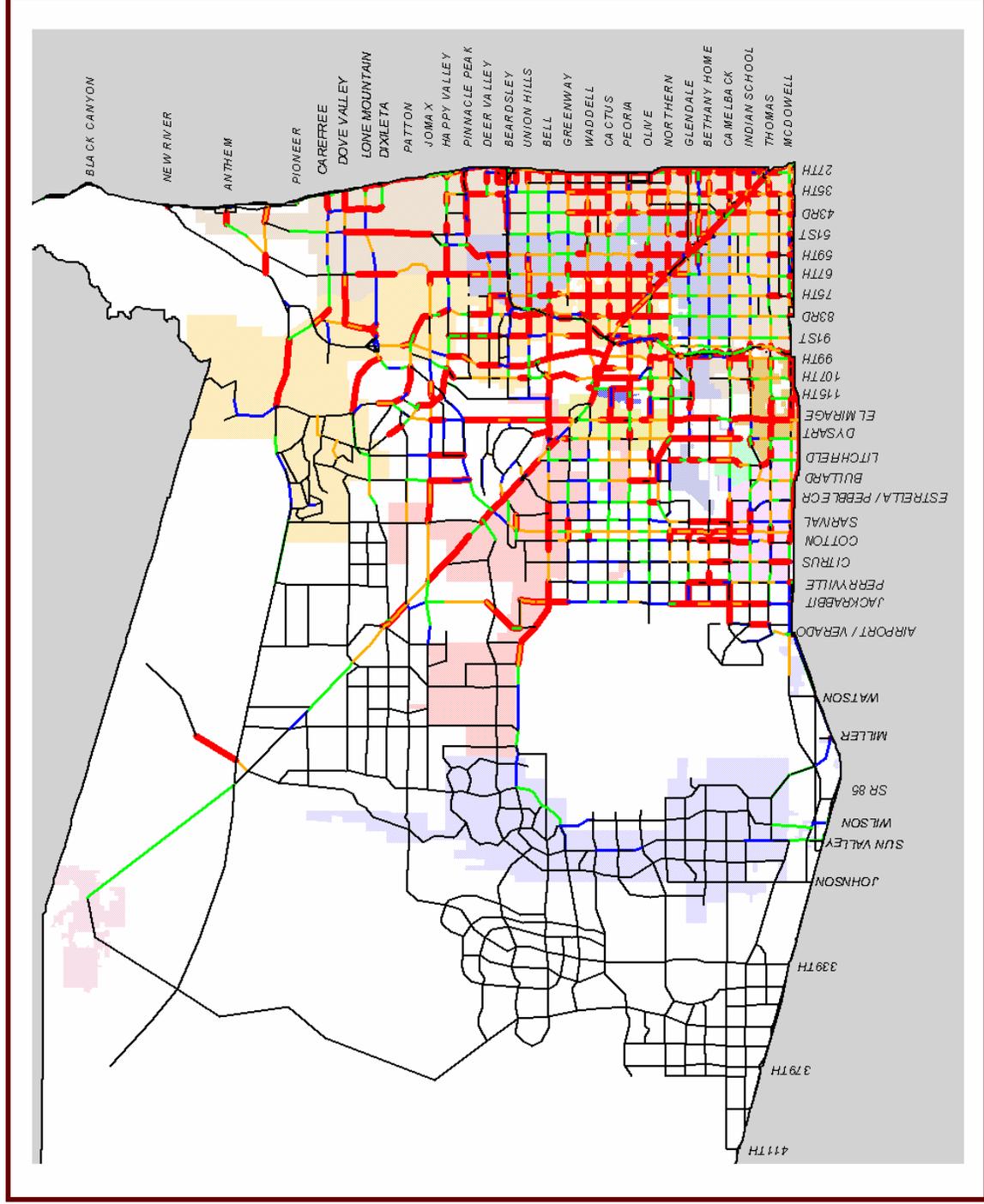
Northwest Area Transportation Study

**NEW CORRIDORS (C)
2030 HOV LOS**

A B C D E-F

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Figure 47: New Corridors Option C Network: 2030 Arterial Segment Level of Service



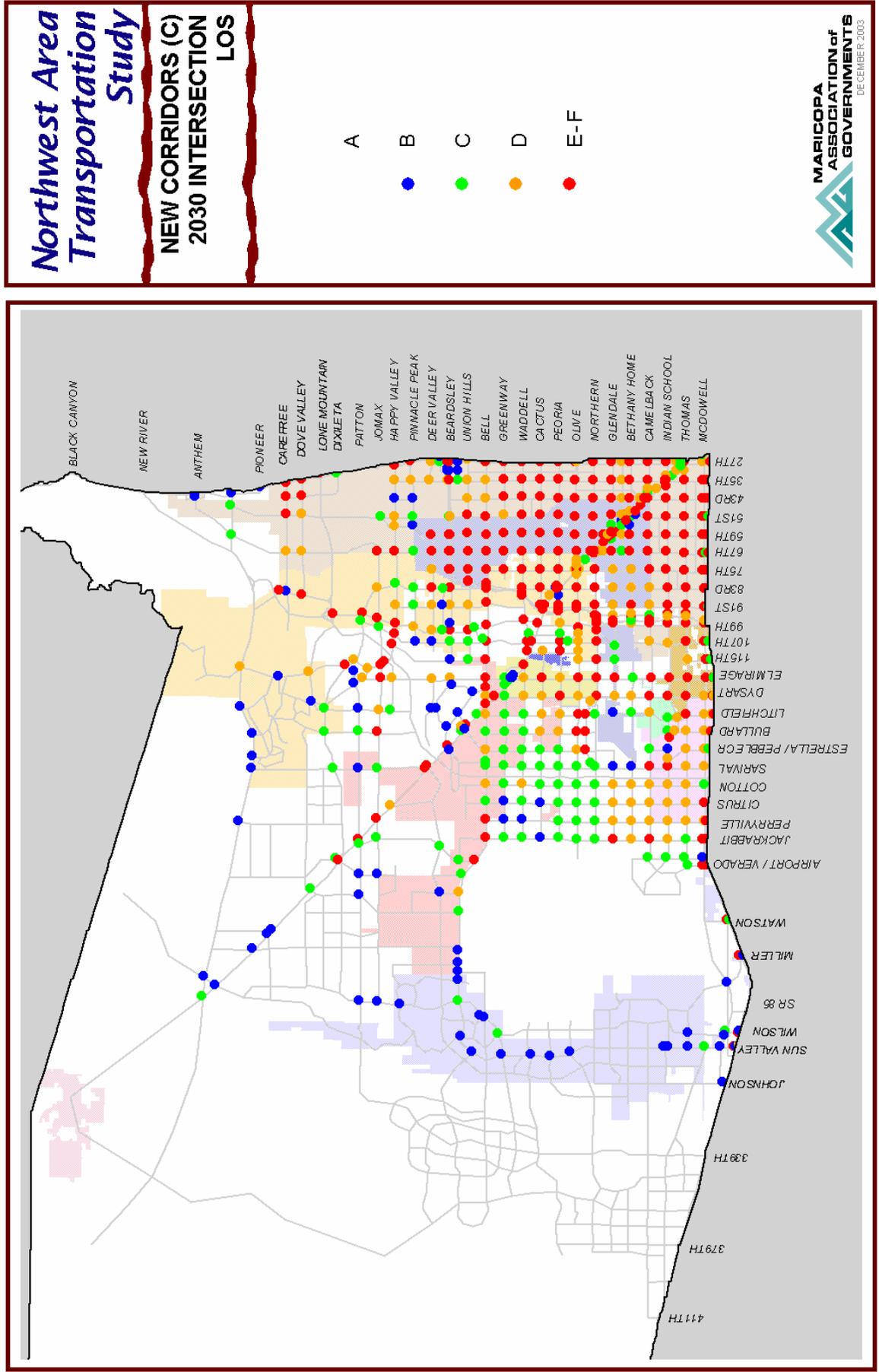
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**NEW CORRIDORS (C)
2030 STREET LOS**

A B C D E-F

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Figure 48: New Corridors Option C Network: 2030 Intersection Level of Service



7.4.2 New Corridors Option A

One additional option, considered in order to measure its impact on the overall Northwest Valley system, was a major reconstruction of I-17 between I-10 and Loop 101. Projections of high traffic volumes in the future indicate capacity is inadequate to carry the demand that can be expected as the region grows. By 2030, volumes on I-17 greatly exceed any currently contemplated number of lanes. Option A proposes to increase the number of lanes on I-17 from the current (and LRTP proposed) 3+1 south of Dunlap and the proposed 4+1 north of Dunlap to a total of 9+1 throughout the stretch.

Part of the reason for the test is to measure the effect it would have on the overall system. Another is recognition that the cost of adding even one or two lanes will be exorbitantly costly and that a major reconstruction would derive substantially more benefit for higher, but potentially comparable dollars. The cost of the project was not explicitly calculated because a 20-lane freeway can be organized in many configurations. Among the possibilities are a double-decked roadway that would require a substantially smaller footprint and designated lanes for specific purposes (e.g., truck lanes, through lanes, etc.)

The cost has been set at \$1 billion + recognizing this would involve a major expense whether an expansion at grade or as a multi-deck option.

The following maps show the effect of the 20 lane freeway on the overall roadway system. As expected, levels of service improve with the increase in capacity on the major system constriction. Though traffic volumes on I-17 rise to over 420,000 ADT, the LOS on all freeways in the Northwest Valley is dramatically improved and many of the nearby arterials also function at a much higher level. There are still some trouble spots, however, north of Loop 101 on I-17 where the rapid loss of lanes in the modeled alternative causes a bottleneck and in the area between Bethany Home and Cactus Roads where intermittent LOS F segments still appear. If this option is selected for further analysis in the RTP process, then additional widening of I-17 north of Loop 101 would be needed.

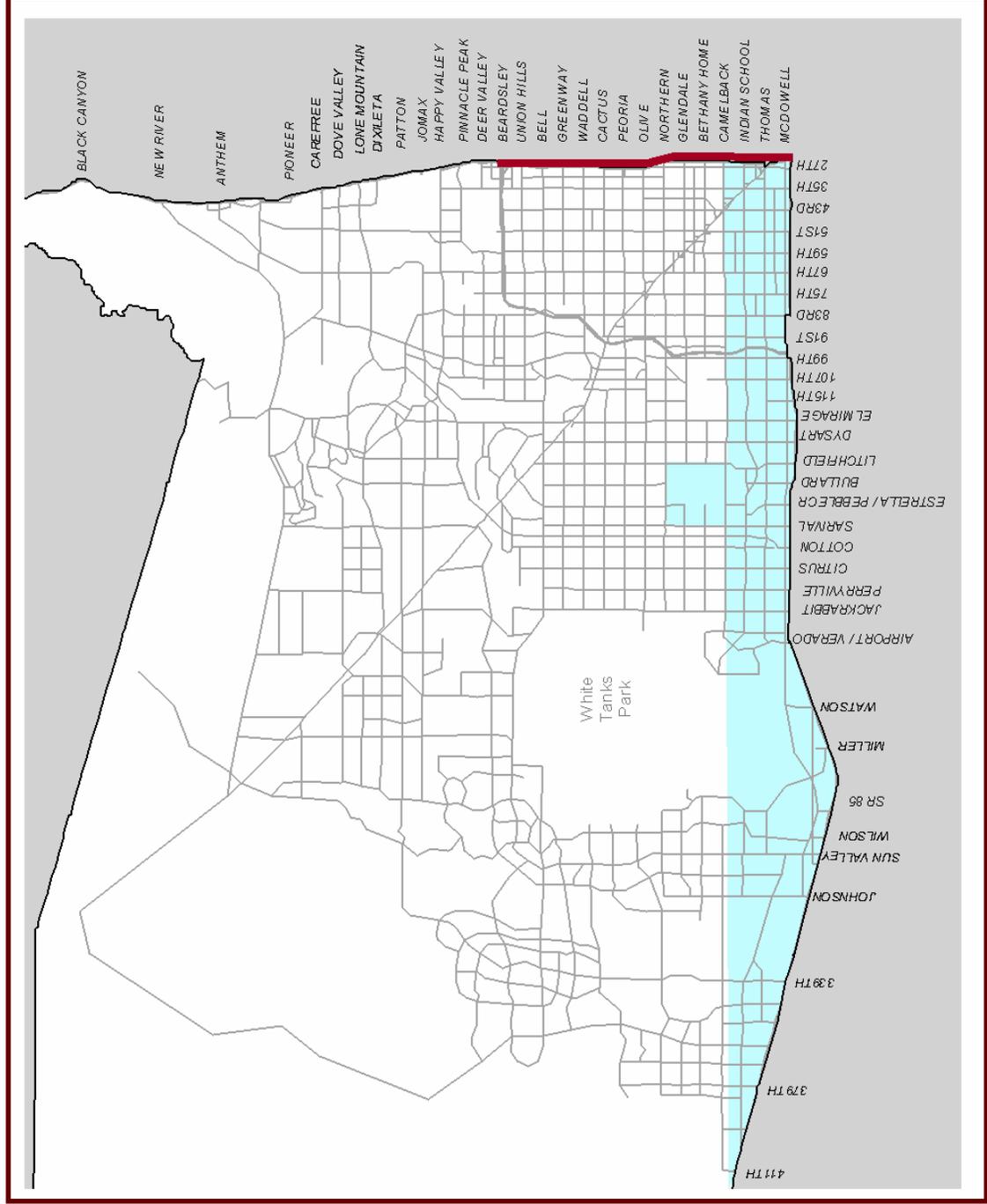
7.4.3 Summary of Roadway Modeling Options

The effect of adding capacity to the highway system is clearly evident in the results shown in Table 26. Congestion levels in 2000 deteriorate dramatically toward 2030 under the first modeling package which focuses primarily on expanding the arterial network. As major projects such as new and widened freeways are added, conditions gradually improve. The number of lane miles added under each scenario in NWATS is substantial. Total lane mile growth, including arterials and freeways, is nearly 240%. Still, the number of congested intersections and lane miles as well as hours of delay, increase substantially in response to anticipated growth in land use.

Table 25: Summary of Roadways Modeling Packages

Measure	2000	2020				2030			
		Future Base	Enhanced	New Corridors (A)	New Corridors (C)	Future Base	Enhanced	New Corridors (A)	New Corridors (C)
Centerline Miles									
FREEWAY	114	135	140	178	196	135	140	178	196
HOV	22	27	97	91	97	27	97	91	97
STREET	993	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643
TOTAL	1,155	1,809	1,879	1,912	1,937	1,809	1,879	1,912	1,937
Lane Miles									
FREEWAY	567	710	1,063	1,655	1,630	710	1,063	1,655	1,630
HOV	545	54	215	194	217	54	215	194	217
STREET	3,146	7,197	7,348	7,245	7,245	7,197	7,348	7,245	7,245
TOTAL	3,859	7,919	8,626	9,094	9,092	7,919	8,626	9,094	9,092
Daily VMT									
FREEWAY	9,200,000	14,900,000	19,000,000	25,000,000	22,700,000	14,800,000	21,600,000	29,900,000	29,400,000
HOV	370,000	800,000	1,900,000	2,100,000	1,500,000	1,000,000	3,000,000	2,000,000	2,400,000
STREET	11,400,000	29,900,000	27,500,000	22,100,000	23,000,000	43,800,000	41,300,000	33,400,000	34,400,000
TOTAL	21,000,000	45,600,000	48,400,000	49,500,000	47,200,000	60,000,000	66,000,000	66,400,000	66,200,000
LOS (number of intersections)									
D	77	117	120	131	114	75	81	90	93
E and F	72	263	217	126	159	456	409	261	291
% congested	31%	52%	48%	46%	45%	62%	55%	41%	43%
Congested Lane Miles									
FREEWAY	42	202	119.81	46.77	75.8	317	306	184	217
HOV	--	23.8	12.3	1	8.8	33	75	21	29
STREET	222	1,052	556	263	356	2,414	1,851	832	937
% congested	7%	16%	8%	3%	5%	35%	26%	11%	13%
Hours of Delay									
FREEWAY	47,043	322,000	176,300	58,792	99,099	1,153,623	584,933	231,862	288,490
HOV		14,000	4,474	213	3,129	61,286	40,414	13,133	13,542
STREET	110,850	630,600	325,389	166,091	203,707	3,790,770	1,604,885	515,314	615,140
Average Speed									
FREEWAY	57	40	47	55	53	21	35	49	45
HOV	60	57	60	61	60	41	56	51	58
STREET	29	26	29	29	29	16	23	28	26

Figure 49: New Corridors Option A Network (same as Option C except for I-17 widening)



Northwest Area Transportation Study

NEW CORRIDORS (A) NETWORK



Widen to 9 plus 1



Figure 50: New Corridors Option A Network: 2030 Daily Volumes.

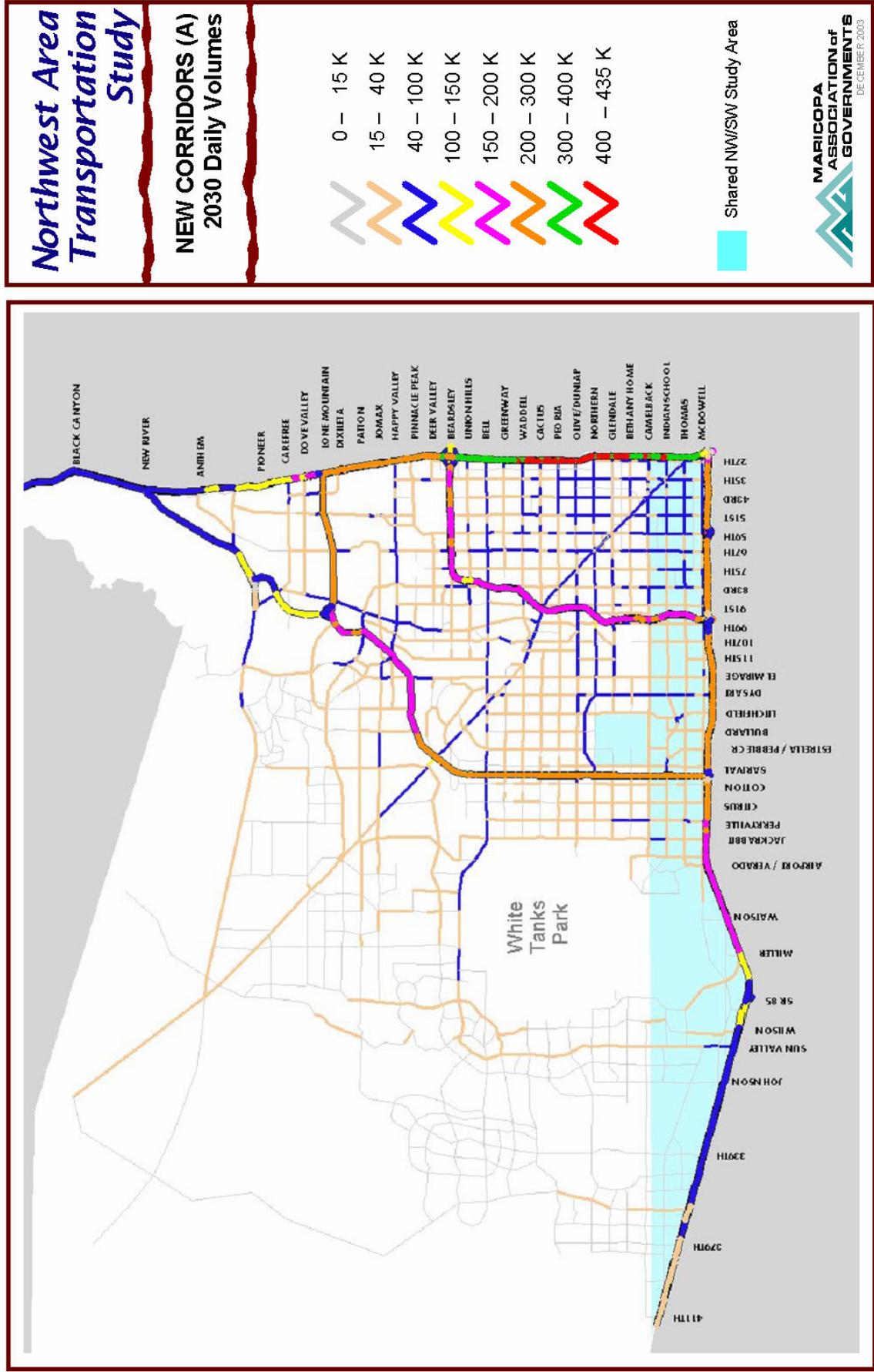
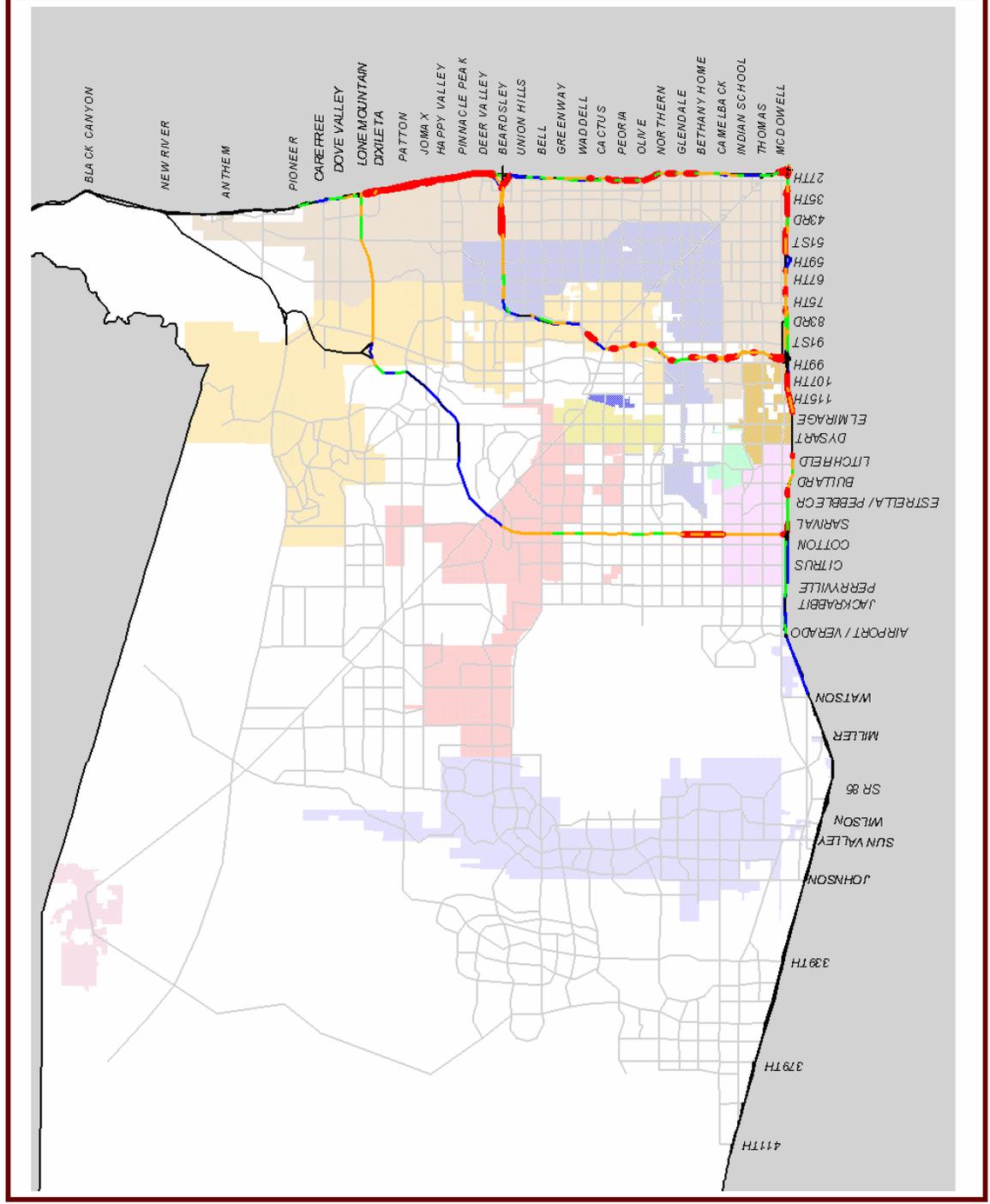


Figure 51: New Corridors Option A Network: 2030 Freeway Level of Service



Northwest Area Transportation Study

**NEW CORRIDORS (A)
2030 FWY LOS**

A B C D E-F

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Figure 52: New Corridors Option A Network: 2030 HOV Level of Service

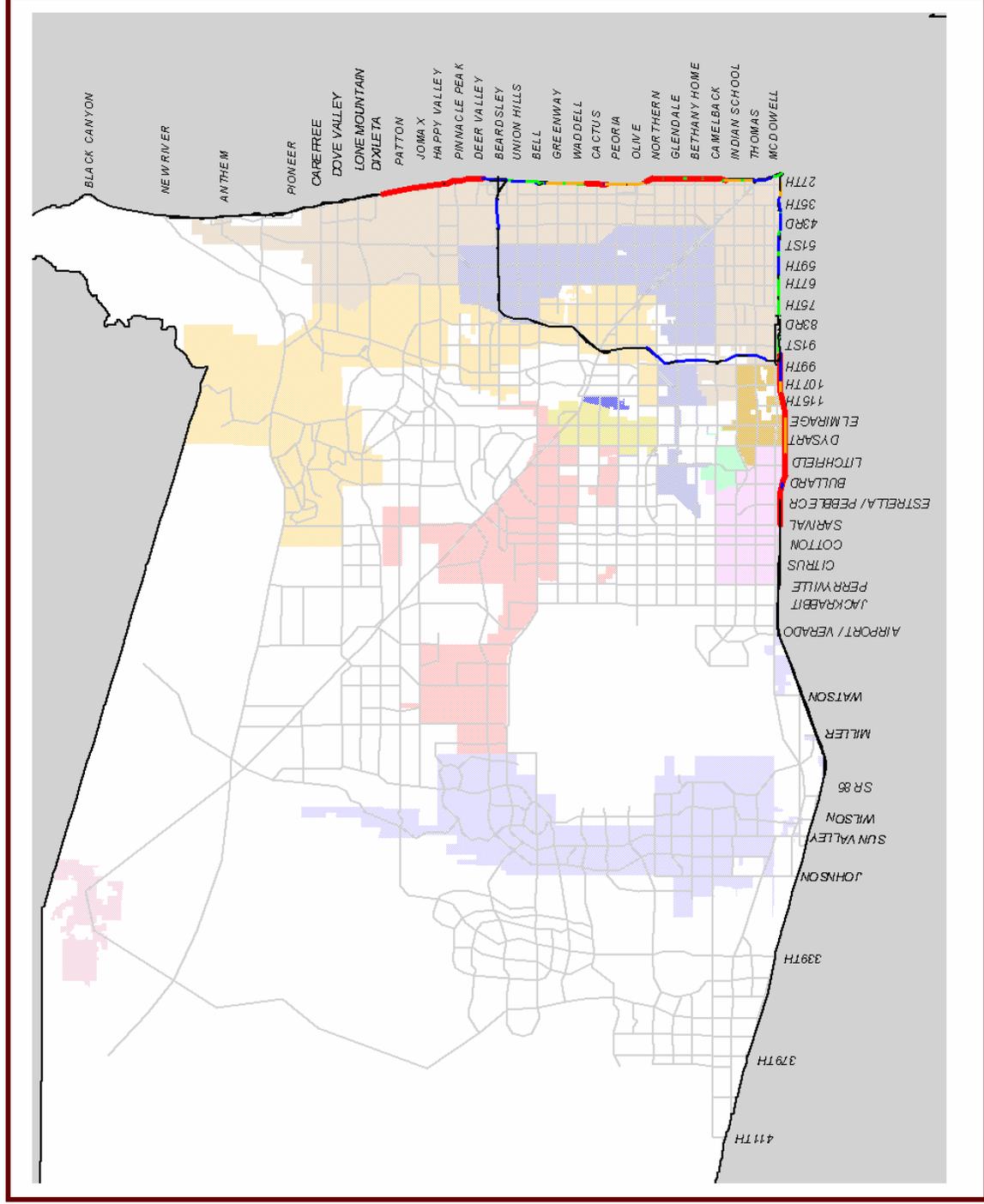


Figure 53: New Corridors Option A Network: 2030 Arterial Segment Level of Service

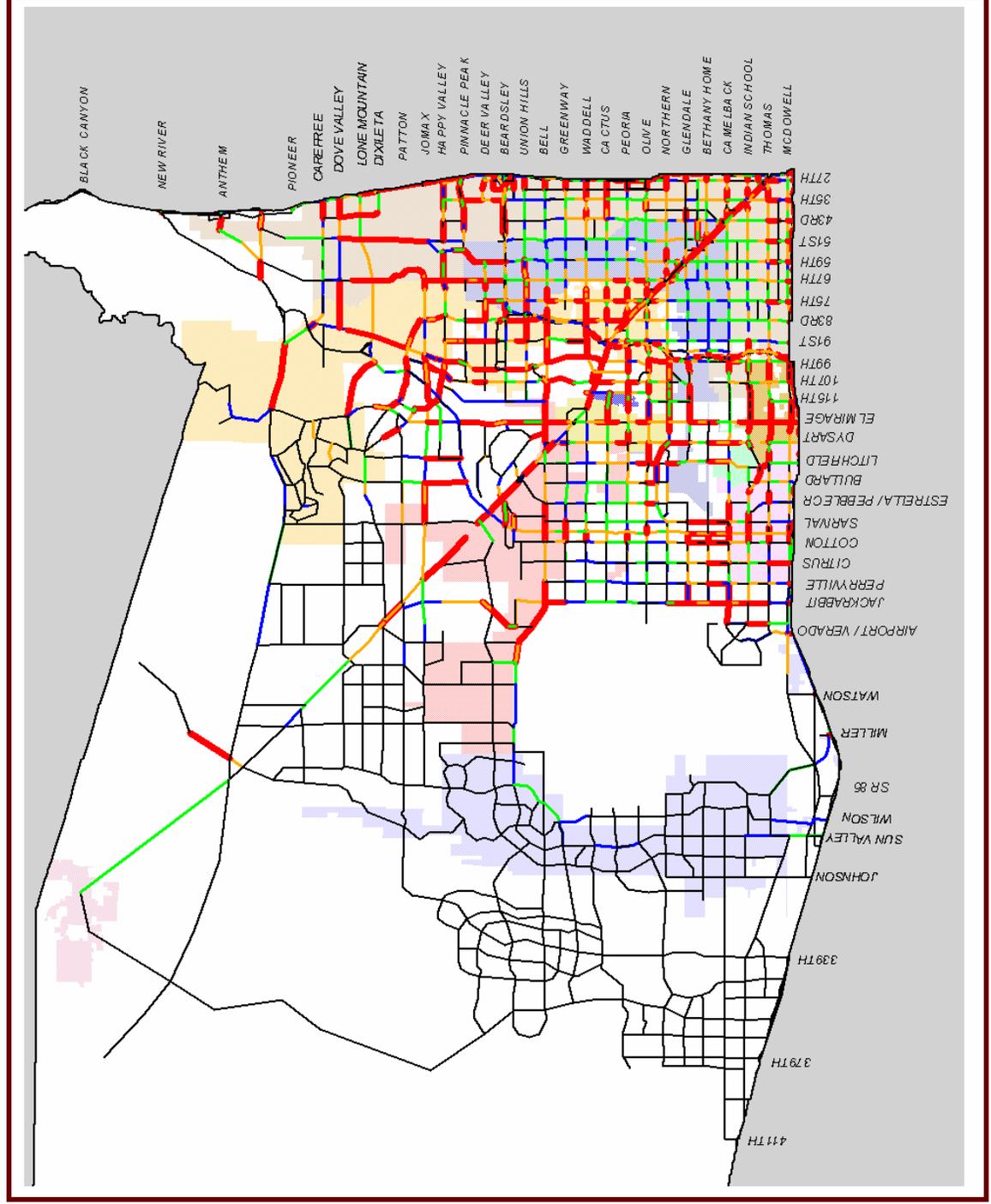
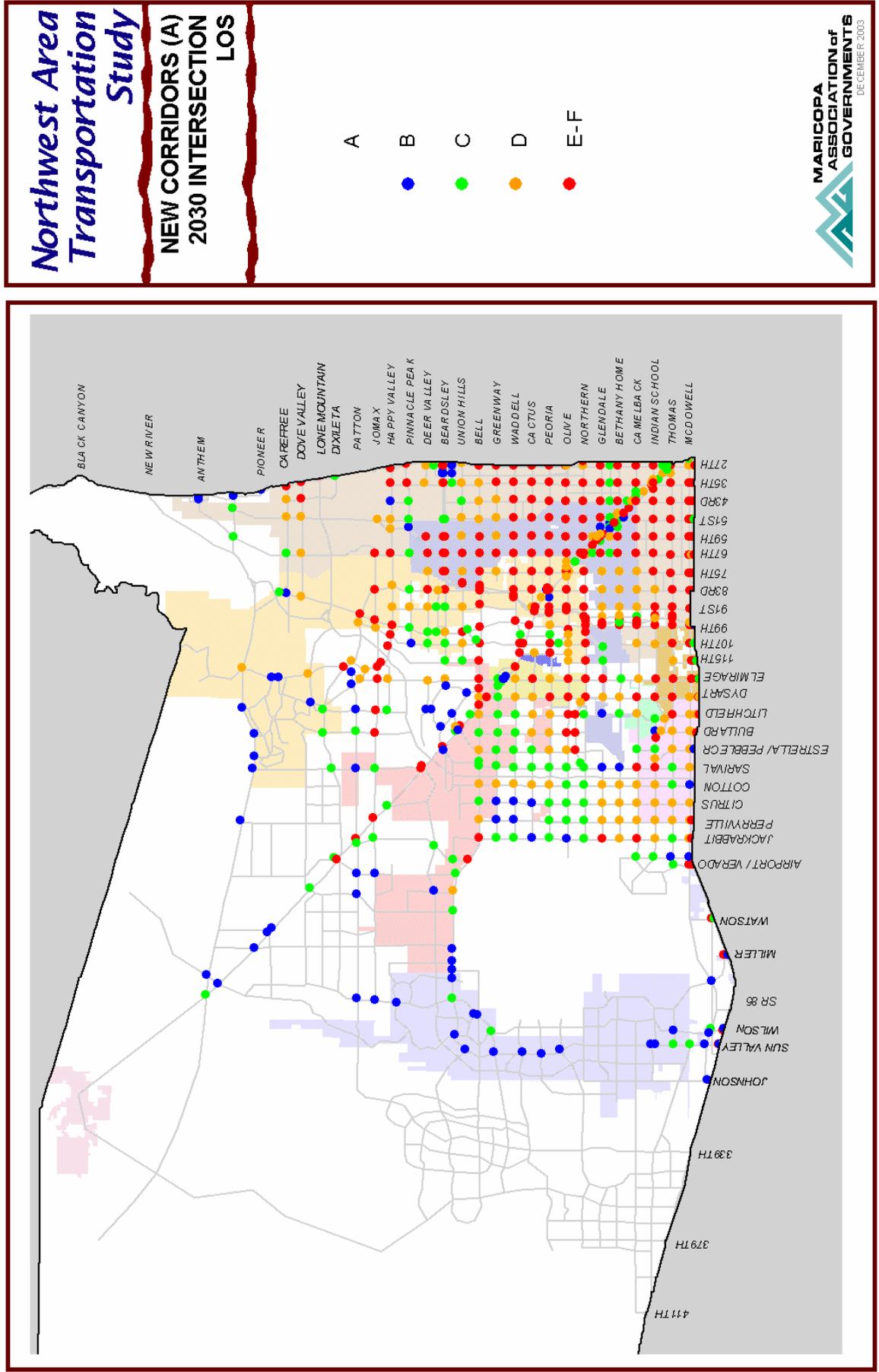


Figure 54: New Corridors Option A Network: 2030 Intersection Level of Service



Some representative figures indicate the challenge to transportation plans in the Northwest Valley:

- In 2030, VMT increases between 284% and 315% (depending on package) over 2000 which more than offsets the percent increase in added lane miles during that period.
- Congested intersections rise from 31% in 2000 to over 62 % in the Future Base package, though the number recovers as new facilities are added to about 43% under the New Corridors option.
- Hours of delay reacts similarly to congested intersections in that it rises from 157,893 hours in 2000 to 5,005,679 in the Future Base and settles back to 760,310 under the best 2030 scenario, New Corridors.

In the absence of substantially more capacity in the roadway system or a major contribution from proposed transit improvements, conditions will very likely worsen over time in the general area. Results from the transit model runs (not yet available) could give an indication of transit's contribution.

7.5 General Safety Assessment

Over the years, traffic count data and crash data have clearly indicated that the number of motor vehicle crashes increase proportionately with increasing vehicle miles of travel (VMT). Although the relationship between the number of crashes and the amount of travel of exposure is not exactly linear, for a planning level safety assessment involving a comparison of the relative safety between planning scenarios, a linear relationship was assumed to be adequate.

This methodology utilizes traffic crash rates, computed either as the number of crashes per 100 million VMT (on continuous highway

segments) or crashes per 100 million entering vehicles (at intersections), to estimate the total number of crashes that we may expect to occur in a future year based on a forecast for the amount of travel in that year. This analysis can be further refined by utilizing particular crash rates generated for different crash severities such as Fatal, Injury or Property Damage Only, and also for different types of road facilities and intersections. Freeway and arterial crash rates used in this assessment to generate future expected crash frequencies were obtained from published literature for other similar urban regions. Similar statistics for the MAG region are being developed by MAG and are not available at the current time.

Table 26 depicts the estimated number of crashes for each of the scenarios modeled and the associated distribution of crash severities for the amount of travel predicted across the transportation network for each scenario. The Current Base for 2002 is based on the same crash rates used to estimate future year crashes and do not reflect the actual totals for crashes in the MAG region for calendar year 2002. When more current statistics and information on road safety in the MAG region become available it will be possible to generate an actual Base Year for studies of this nature. Therefore, projections generated for the Current Base are only for comparison purposes.

The comparison of the Future Base and the three scenarios against the Current Base show varying impacts on roadway safety due to different improvements to the roadway system assumed for each scenario. As expected, there are substantial increases in the total number of crashes and within each crash category (i.e., fatal, injury, property-damage-only) due to increased VMT on the highway system. For example, for the two

base cases the total number of freeway crashes is expected to increase from 4,920 in 2002 to 8,761 in 2030, an increase of 78 percent. A comparison of total arterial road segment crashes shows an increase of 168 percent.

For the 2030 Future Base assumed network conditions, the estimated number of crashes is an increase of 122 percent over the 2002 Current Base. An examination of the Enhanced, New Roadways and Option A scenarios clearly depict that each of these scenarios will produce an improvement in overall road safety in comparison to the Future Base. Most of these improvements are due to more travel occurring on the freeway system as opposed to the arterial system. Although the total number of crashes on freeways appear to have increased, significant

reduction in crashes are affected on arterial roadway segments and at intersections.

Projections for systemwide safety improves as additional freeway and expressway/parkway capacity are constructed as reflected in the Enhanced and New Corridors scenarios. Results indicate that building more freeways shifts traffic to freeways, increasing the relative number of accidents on freeways, but reducing the total number.

In conclusion, a comparison of both total, and fatal and injury crashes for New Corridors (Options A and C scenarios) indicates that these two scenarios are the best options from a safety viewpoint. They will lead to almost identical safety improvements over the Future Base scenario, with the New Corridors Option A scenario slightly ahead due to fewer projected injury crashes.

Table 26: Regional Roadway Segment Crash Projections

	Current Base	New Corridor A		New Corridor C		Future Base		Enhanced	
	2002	2020	2030	2020	2030	2020	2030	2020	2030
Freeway									
Fatal	22	53	63	51	62	33	36	38	42
Injury	1,418	3,781	4,670	3,649	4,562	2,298	2,516	2,644	2,949
PDO	3,480	9,340	11,559	9,012	11,292	5,668	6,209	6,521	7,277
Total	4,920	13,174	16,292	12,712	15,916	7,999	8,761	9,203	10,268
Arterial									
Segment Fatal	74	121	155	123	156	148	192	142	184
Segment Injury	6,699	11,149	14,299	11,295	14,380	13,717	17,972	12,756	16,709
Segment PDO	13,361	22,328	28,712	22,639	28,901	27,406	35,892	25,534	33,478
Segment Total	20,134	33,598	43,166	34,057	43,437	41,271	54,056	38,432	50,371
Intersection	15,219	20,737	23,054	20,838	23,228	23,083	26,411	22,869	25,878
Total	40,273	67,509	82,512	67,607	82,581	72,353	89,228	70,504	86,517

Table 27: Regional Traffic Volume Projections

	Current Base	New Corridor A		New Corridor C		Future Base		Enhanced	
	2002	2020	2030	2020	2030	2020	2030	2020	2030
Freeway VMT ⁷	2,179	5,397	6,514	5,227	6,372	3,341	3,635	3,849	4,257
Arterial Intersection NEV	15,219	207,955	297,207	300,652	365,572	359,504	448,461	340,453	423,824
Arterial Segment VMT ⁸	4,002	6,610	8,553	6,745	8,659	8,047	10,413	7,685	10,037

⁷ Million vehicle miles traveled⁸ One hundred vehicles

7.6 Multimodal Considerations

This option is designed to reflect the full buildout of the transportation system in support of a higher projected level of socio-economic development. It will include all major new roadways and major new transit service including the results of the MAG High Capacity Transit Study and the RPTA Regional Transit Systems Study. The roadways will have been evaluated in previous runs, but the complementary transit components will be evaluated for the first time in the overall network. The results will indicate how well the combination of options serves the mobility needs of the Northwest Valley.

The Total Scenario has not been modeled for this analysis because the transit elements were under development. Individual projects of significance shown in the MAG High Capacity Transit Study and the RPTA Regional Transit Systems Study have been identified as part of the overall transportation plan and form the basis of the information contained in this section.

The key elements of the transit system for the Northwest Valley are described below.

7.6.1 High Capacity Transit (*from MAG High Capacity Transit Study-HCTS*)

The HCTS was undertaken to investigate the need for high capacity transit in the region as congestion on roadways worsens. It resulted in a number of corridors that appear to justify further consideration in terms of demand. Each corridor is intended to show the potential high capacity performance within the corridor and the roadway name is identified only as a means of placing the corridor geographically. The actual location of a high capacity line could be anywhere within the broader corridors shown in Figure 55.

Among the projects that are likely to receive further consideration are:

Light Rail/Dedicated BRT

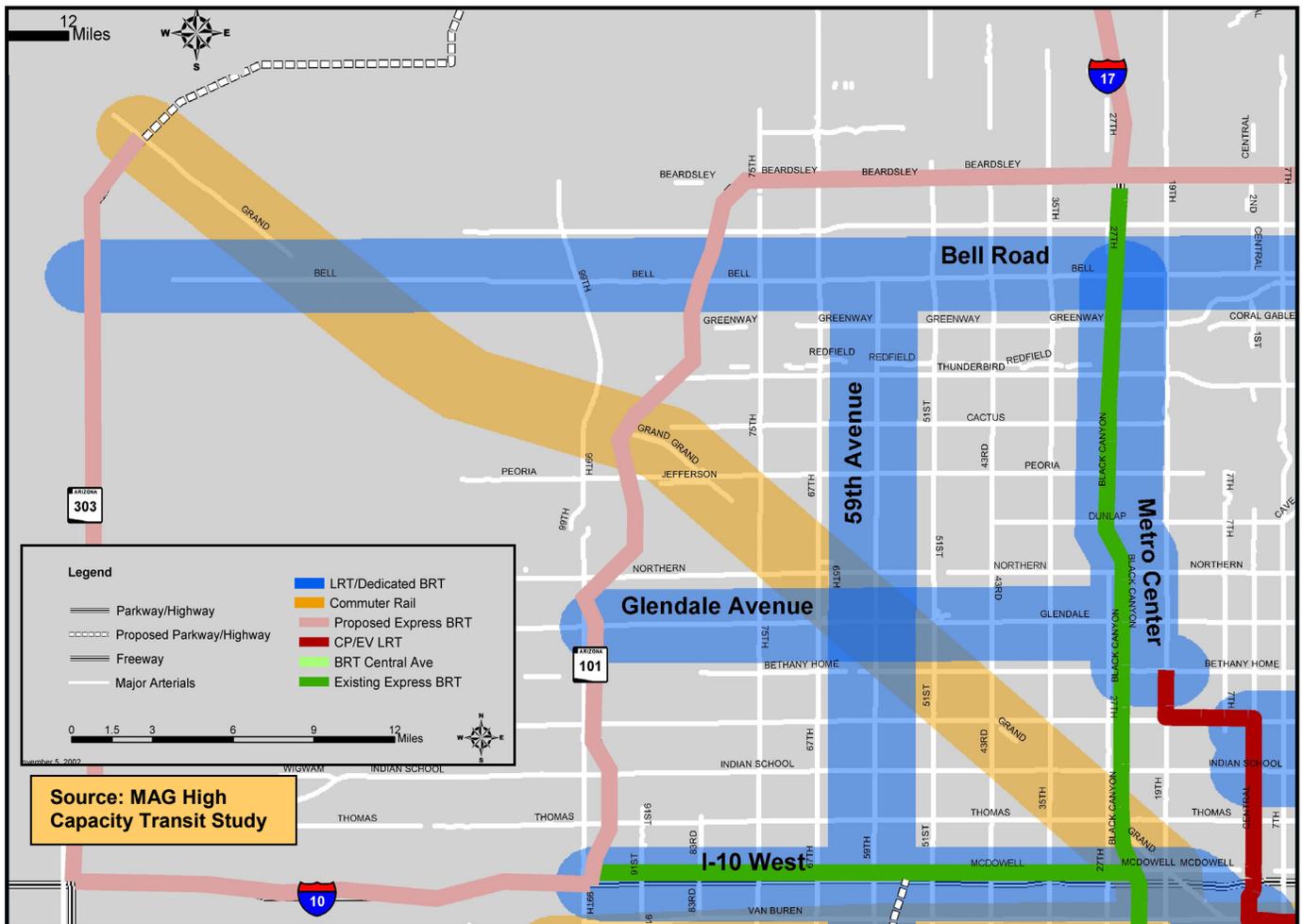
Light rail is identified in the HCTS where it is an extension of another light rail line. In most other corridors, high capacity corridors would accommodate either LRT or Dedicated BRT depending on demand and the results of further study. For clarity, it should be noted that BRT is proposed in two forms: 1) Express BRT which uses freeway corridors and is similar to express bus service and 2) Dedicated BRT which relies on separated guideways that could be on street to expedite travel and compete more effectively with the automobile. If not indicated otherwise, BRT refers to Dedicated BRT.

- I-17 Extension – this would take the Central Phoenix/East Valley LRT line beyond MetroCenter along I-17 as far as Bell Road.
- I-10 line – is being evaluated as a new LRT line along or within the right-of-way of I-10.
- City of Glendale Extension – would link Glendale to the Central Phoenix/East Valley LRT line and is identified in the Go Glendale program.
- Bell Road – This would provide for high capacity service, either LRT or BRT, along the major east-west arterial corridor in the Northwest Valley. Model projections indicate very high potential for this corridor.
- 59th Avenue – In keeping with the need to offer more capacity between I-10 and Bell Road in Glendale, this link has the potential to be an effective high capacity service and is considered for either LRT or BRT.
- Loop 101 – An Express BRT route is shown along Loop 101.

- Loop 303 south of Grand Avenue – Express Bus
- I-10/I-17 – Express bus is shown beyond the termini of LRT/BRT services. Additional lines may be considered in the RTP process.

Commuter rail is included in the Grand Avenue Corridor along the existing BNSF tracks as far as Surprise. Bus rapid transit (BRT) is also a possibility for this corridor, and will be assessed further in the MAG Phase II Major Investment Study for Grand Avenue.

Figure 55: Northwest High Capacity Transit Network



7.6.2 Fixed Route and Demand Response Transit

Based on the results of the Valley Metro Regional Transit Systems Study, a significant increase in transit service will be needed as the Northwest Valley develops. Figures 56 and 57 show the extensive coverage to be added to the limited service available only in the easterly most portions of the Northwest Valley today. Table 28 below indicates the breakdown of service by type and proposed level of service in revenue hours.

7.6.3 Transit Facilities

The major facilities needed to support the proposed growth in transit services are shown in Figure 58.

Park and Ride Facilities – 13 new park and ride lots with associated amenities would be built in the Northwest Valley under the transit scenario evaluated in the RTSS. This includes 4 lots specified in the existing Transportation Improvement Program and 9 proposed throughout the Northwest Valley strategically located to offer ready access to major highways and LRT or BRT corridors.

Transit Centers – two new transit centers are needed in the Northwest Valley, one near Bell Road and Loop 101, the other near the terminus of the Central Phoenix/East Valley LRT. These in addition to the existing centers, will be a focus of transit activity in the Northwest Valley and are likely to precipitate further supporting facilities such as improved bicycle and pedestrian access.

Table 28: Transit Requirements (from Valley Metro Regional Transit System Study)

MPA	Transit Needed		Proposed Service					
	Current 2000	Future 2030	Urban Fixed-Route	Urban Circulator & Other	Rural Transit Access	Rural Transit Access	ADA Paratransit	Elderly Paratransit
	(Rev Mi)	(Rev Mi)	(Rev Mi)	(Rev Mi)	(Rev Mi)	(Rev Hrs)	(Rev Hrs)	(Rev Hrs)
Avondale	1,052	4,367	3,928	258	180	8	23	16
Buckeye	564	16,510	13,773	808	1,929	80	106	79
El Mirage	291	1,949	1,897	52	na	na	16	14
Glendale	7,095	11,716	12,598	0	na	na	71	52
Goodyear	778	12,371	6,513	2,402	3,456	144	77	83
Litchfield Park	103	376	444	0	na	na	2	4
Peoria	2,958	10,472	8,865	1,163	444	18	92	131
Phoenix	50,844	82,271	70,863	10,039	1,369	57	522	411
Surprise	1,160	10,760	9,530	410	819	34	93	148
Tolleson	485	1,075	1,176	0	na	na	2	2
Wickenburg	347	882	na	na	882	37	5	7
Youngtown	163	295	156	140	na	na	5	9
Maricopa County	2,876	5,356	3,584	0	1,811	75	110	271

Figure 56: Local Northwest Network and Rural Transit Access

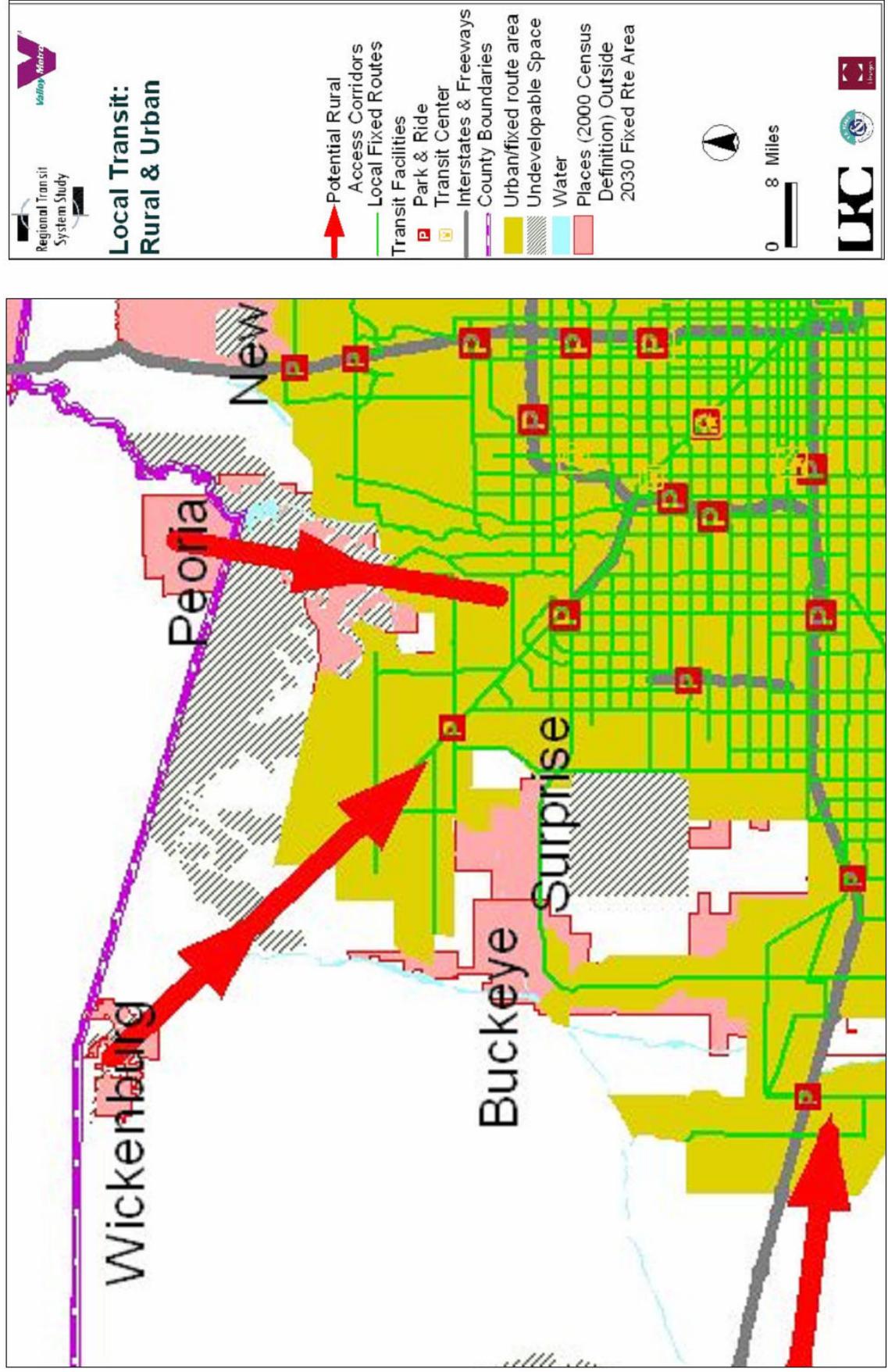


Figure 57: 2030 Northwest Local Transit Service Needs

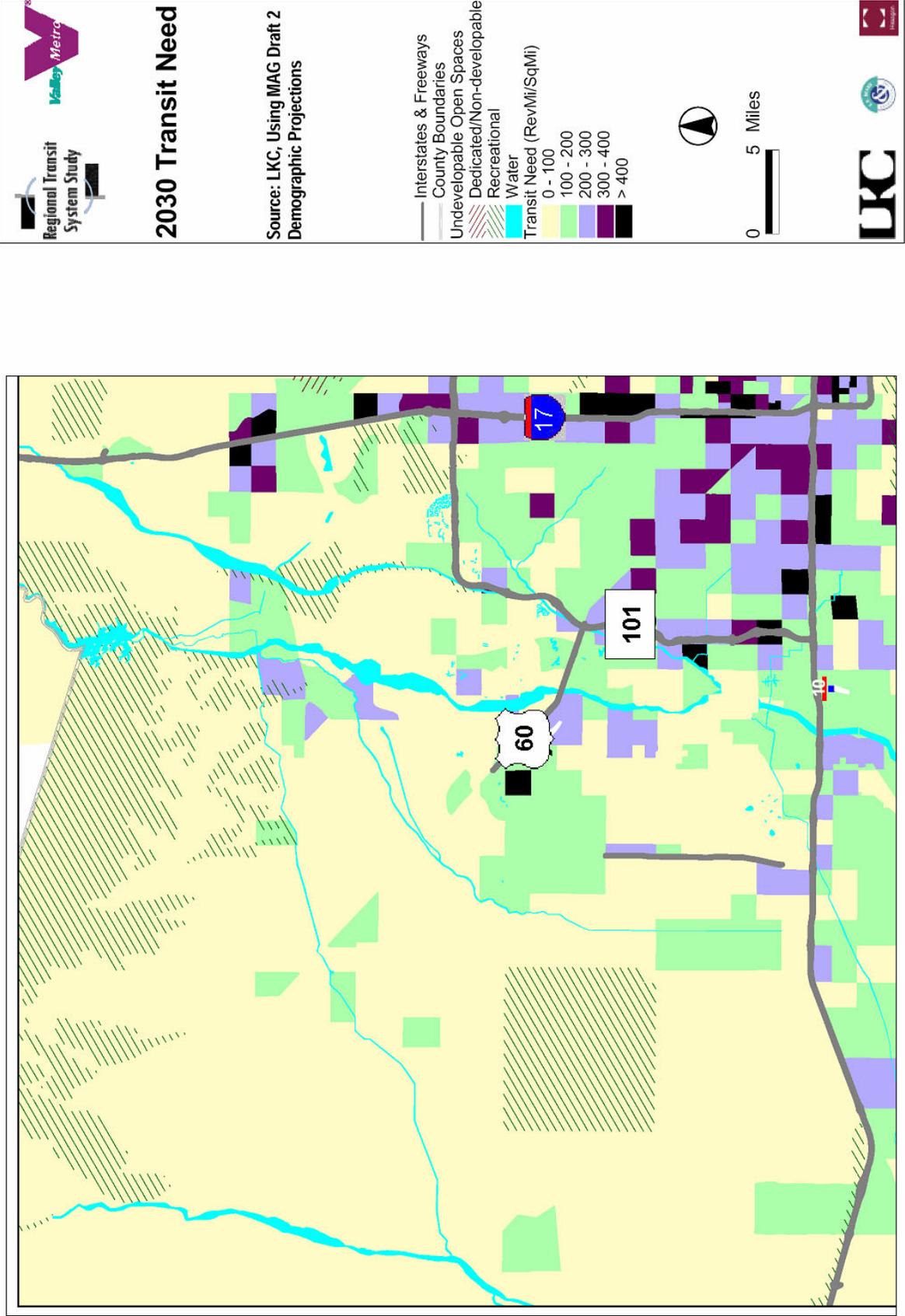
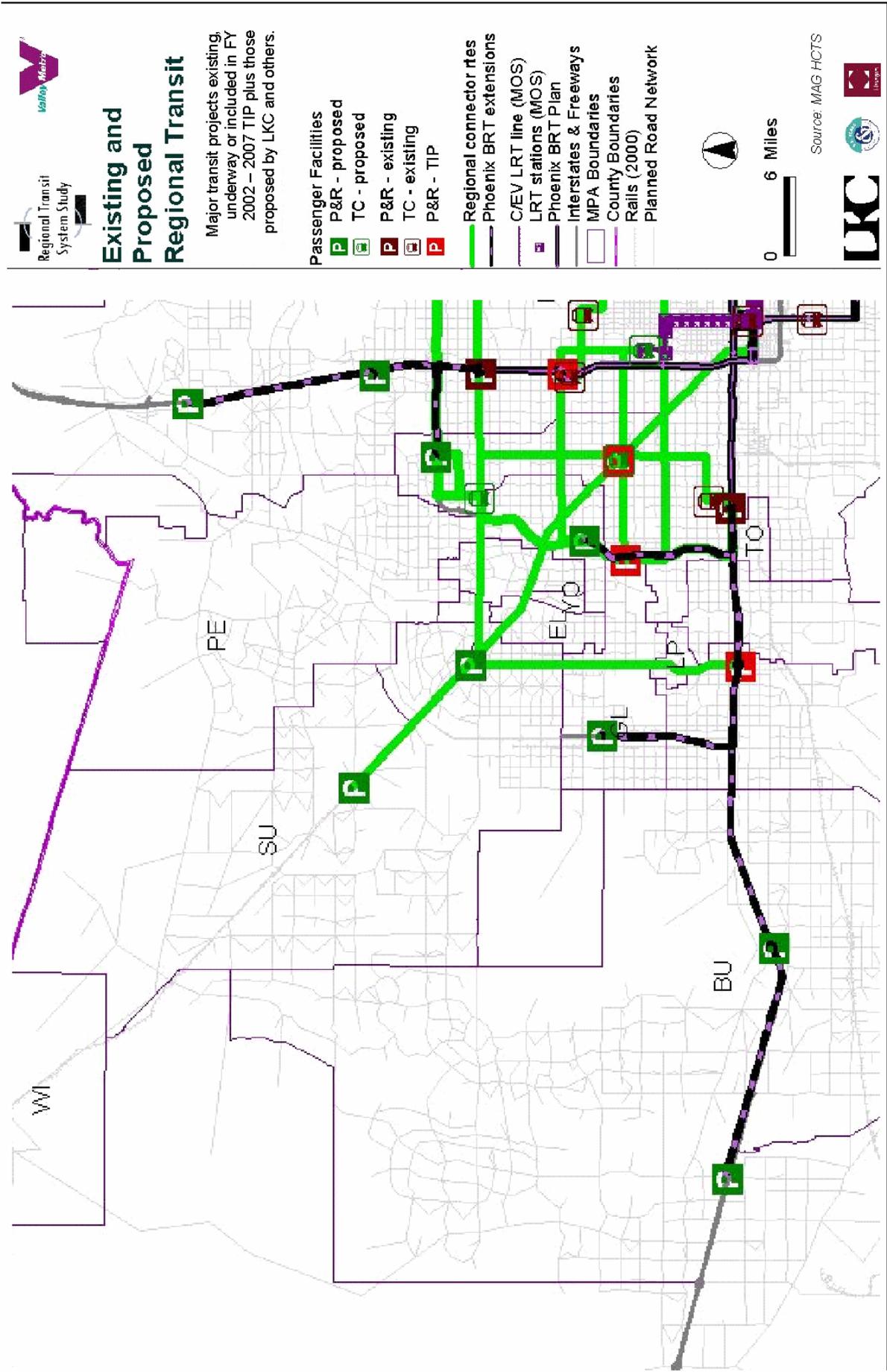


Figure 58: Proposed Regional Connections



7.6.4 Transit Costs

The costs identified for the transit systems are based on the work completed by MAG and Valley Metro-RPTA on the High Capacity Transit Study and the Regional Transit Systems Study. They are included as a means of offering a more complete picture of the multimodal needs in the Northwest Valley. The figures in Table 29 are capital costs based on the highest priority corridors and services reported in the two studies.

Table 29: Capital Cost of Transit Improvements

PROJECT	COST (BRT / LRT)
Grand Avenue Commuter Rail*	\$740 million
Glendale Avenue LRT	\$430 million
I-10 West LRT/Dedicated BRT	\$400 million
59th Avenue LRT/Dedicated BRT	\$730 million / \$360 million
Bell Road LRT/Dedicated BRT	\$700 million / \$345 million
MetroCenter LRT	\$340 million
Transit Service Vehicles	\$90
Park and Ride Lots	\$40
Transit Centers	\$8
TOTAL	\$3.47 billion / \$2.74 billion

* *Bus rapid transit is also an option for Grand Avenue. Its costs would be expected to be lower than costs for commuter rail service.*

7.6.5 Non Motorized Elements

The emphasis on the non-motorized plan identified in this report for the Northwest Valley was to identify those off-road routes that could afford improved connectivity and wide-ranging access within the area. On-road bicycle facilities are included in the estimate of arterial costs, but selected supporting policies are reiterated to complement the recommended capital improvements. Under these assumptions, 130 miles of bicycle

facilities were identified along major flood control corridors, canals and other linear features. The Future Non-Motorized Off Street System Map (Figure 60) shows the location of the main corridors recommended to expand the Northwest Area non-motorized plan. In addition, there are many on-street facilities identified for implementation in the MAG Regional Bicycle Plan and in the Long Range Transportation Plan that will serve as a method for identifying critical on street links to be phased in over time.

More generally, with a focus on the policy component of the plan, it is also appropriate to strengthen the commitment to improving the local as well as the regional path systems to ensure the long term integrity and internal connectivity of the plan. The objective is to take advantage of other transportation capital projects where possible and minimize what would otherwise be a substantial burden on limited regional non-motorized funds.

Policies that would support the orderly expansion of the non-motorized plans include:

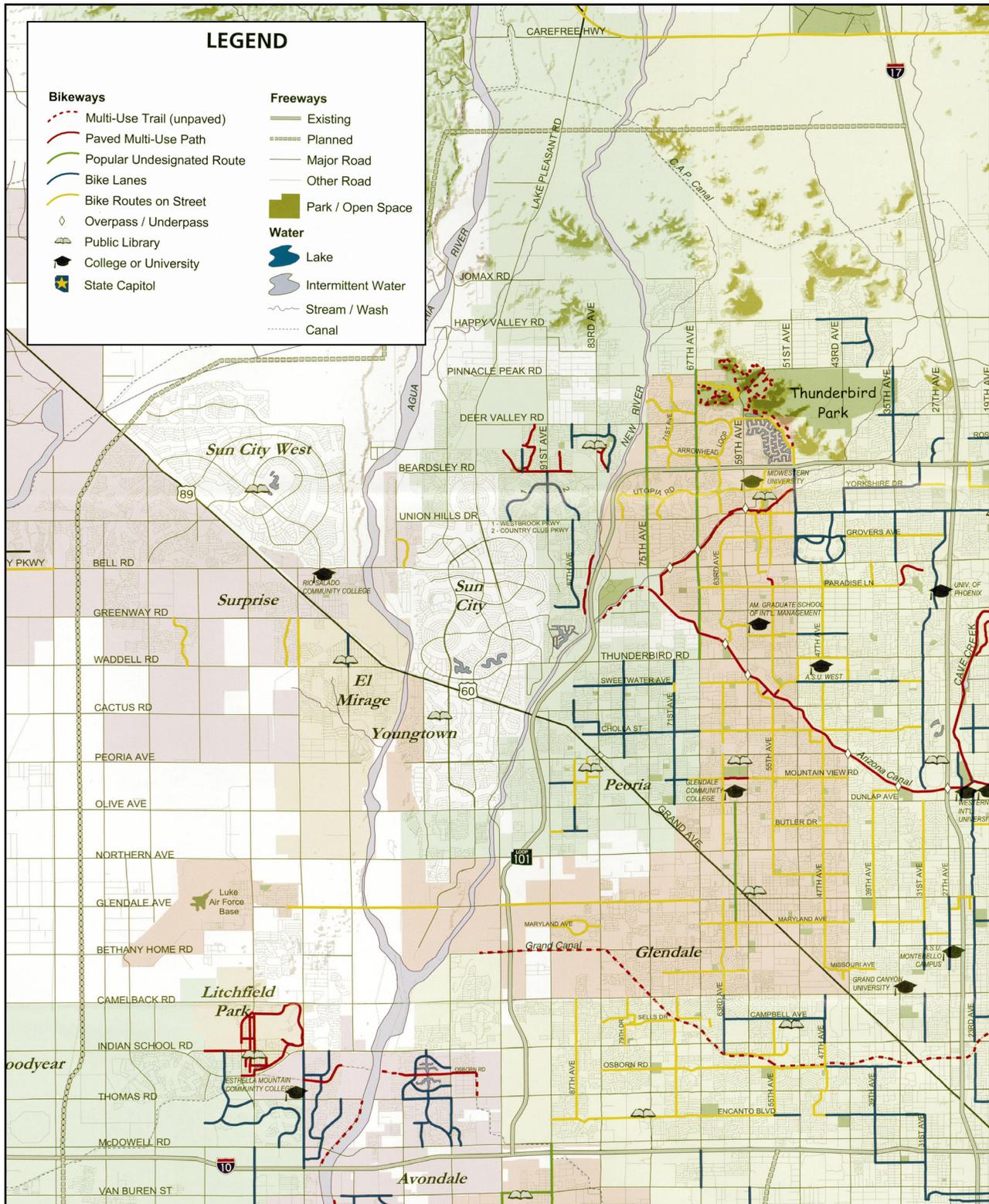
- Consistent with the assumptions for arterial construction costs, all future roadway improvements should accommodate bicycle projects to ensure continuity in the regional bicycle system with strong connectivity to the local network. This includes not only bike lanes on street, but also the addition of bicycle detection devices and proper bicycle striping at street intersections and investigating the opportunity to add bike lanes when restriping lanes as well as during new construction. Where necessary, communities should consider adopting modified roadway cross-sections to allow safe expansion of the bicycle system as proposed in the MAG Regional Bicycle Plan.

- A primary funding element should include construction of bridges and crossings that help eliminate barriers to bicyclists and pedestrians such as at or near freeways/expressways and major drainage courses. Some of this is covered in the funding proposed in this report for major regional off-road paths.
- In support of the transit program, transit facilities such as stations and park and ride lots must accommodate bicycle amenities (e.g., lockers, bike racks, etc) to encourage use of non automotive modes of travel.

Table 30: Regional Non-Motorized System Off-Road Costs

Element	Miles	Cost (Millions)
NW Regional Off-road Bicycle Improvements	130	\$200
TOTAL	130	\$200

Figure 59: Existing Bicycle and Multi-Use Facilities



Source: Bikeways Metropolitan Phoenix Area, Maricopa Association of Governments, 2003

7.7 Goods Movement

The pattern of goods movement, as measured by truck volume forecasts, remains fairly constant across the alternative scenarios. Average daily truck volumes are illustrated in Figures 61-65.

As summarized in Table 31, trucks represent approximately 27% of all traffic assigned. This is 40% of all freeway traffic in the 2000 scenario, 43% in the Enhanced Corridors scenario and 36% in both New Corridors scenarios. Trucks travel more miles on freeways than streets in the 2000 scenario, but then this pattern flips in the Future Base

case where heavy freeway congestion forces a higher percentage of all traffic onto the arterials. When more roadway capacity is added in the Enhanced Corridors scenario, there is a slight shift back to the freeways. When even greater capacity is added to the freeway system in the New Corridor scenarios, it appears that trucks return to the pattern of predominant freeway usage. Interestingly, the total truck VMT in the Future Base scenario is notably lower than in the other future scenarios. With the massive congestion on I-10 in that scenario it could be expected that trucks get routed through other parts of the region.

Table 31: Truck VMT (in millions)

	2000			FUTURE BASE			ENHANCED			NEW CORRIDORS (A)			NEW CORRIDORS (C)		
	truck	auto	All	truck	auto	All	truck	auto	All	truck	auto	All	truck	auto	All
FREEWAY	3.4	5.0	8.4	5.5	8.4	13.9	7.6	10.0	17.6	9.6	17.3	26.9	9.2	16.2	25.4
STREET	2.0	9.4	11.4	10.0	35.5	45.5	9.5	33.0	42.5	7.5	27.0	34.5	7.8	27.6	35.4
TOT	5.4	14.4	19.8	15.5	43.9	59.4	17.1	43.0	60.1	17.1	44.3	61.4	17.0	43.8	60.8

FREEWAY	40%	60%	100%	40%	60%	100%	43%	57%	100%	36%	64%	100%	36%	64%	100%
STREET	18%	82%	100%	22%	78%	100%	22%	78%	100%	22%	78%	100%	22%	78%	100%
TOT	27%	73%	100%	26%	74%	100%	28%	72%	100%	28%	72%	100%	28%	72%	100%

FREEWAY	63%	35%	42%	35%	19%	23%	44%	23%	29%	56%	39%	44%	54%	37%	42%
STREET	37%	65%	58%	65%	81%	77%	56%	77%	71%	44%	61%	56%	46%	63%	58%
TOT	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Figure 61: 2000 Truck Volumes

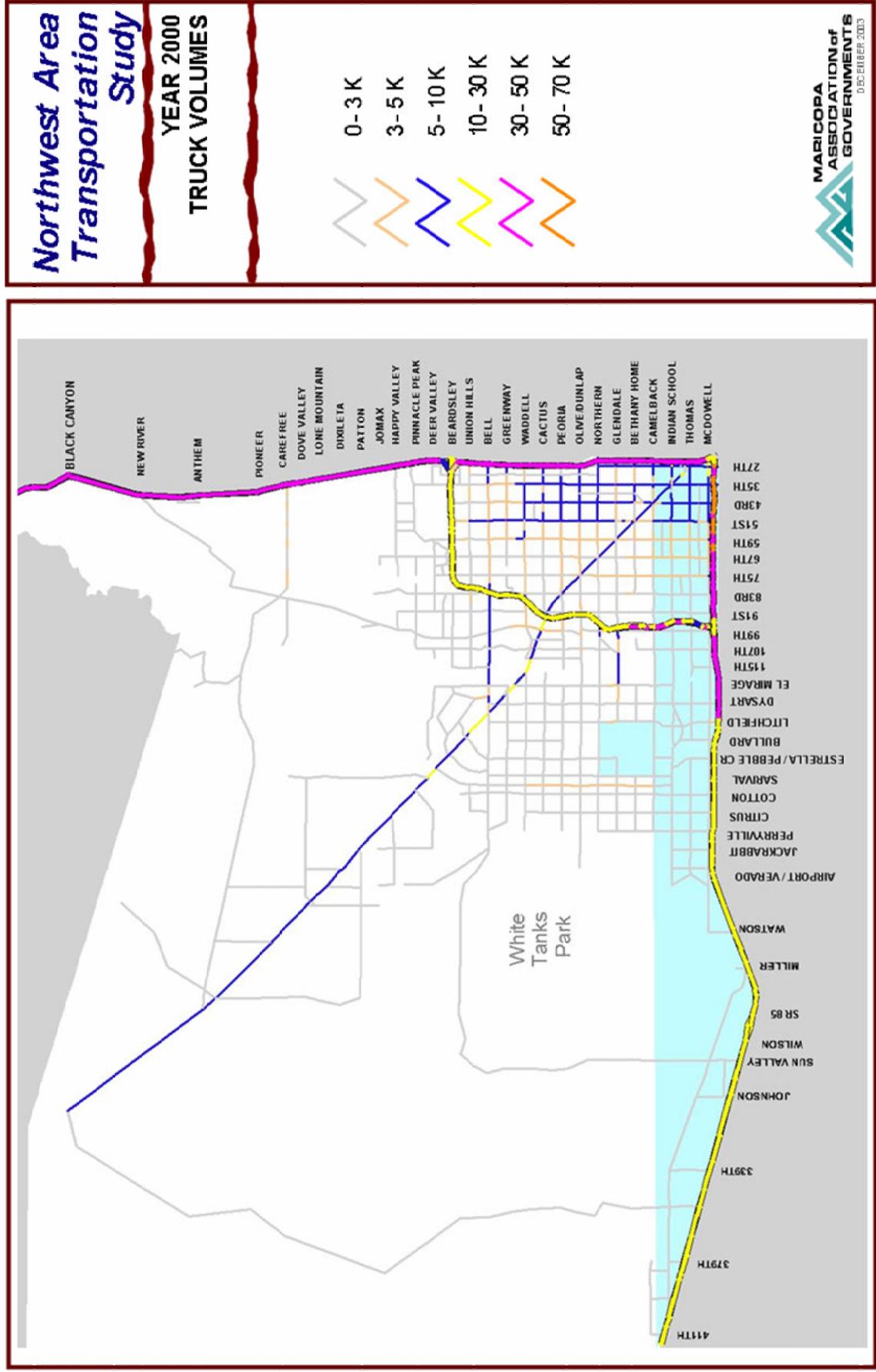


Figure 62: Future Base Truck Volumes

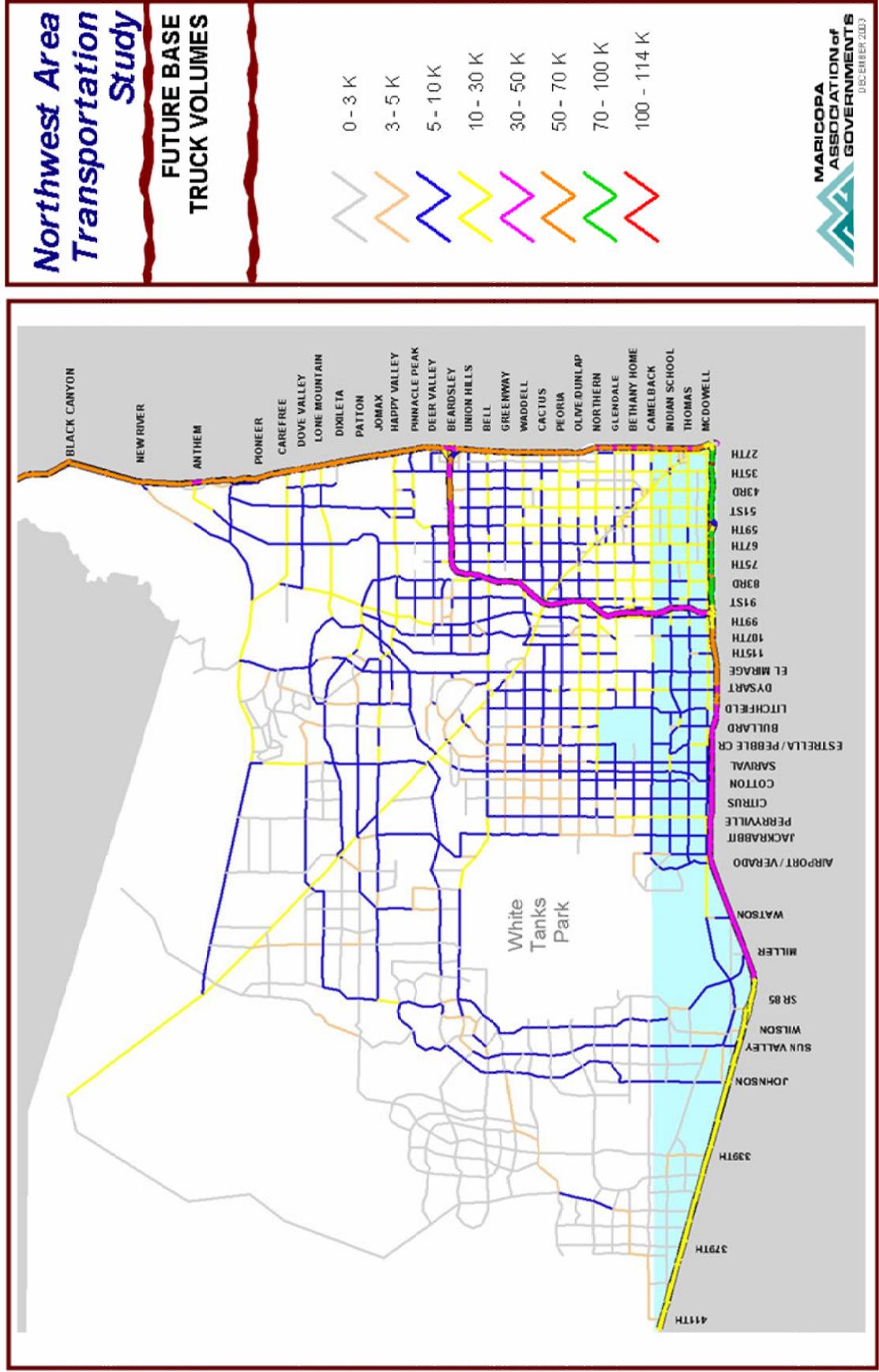


Figure 63: Enhanced Corridors Truck Volumes

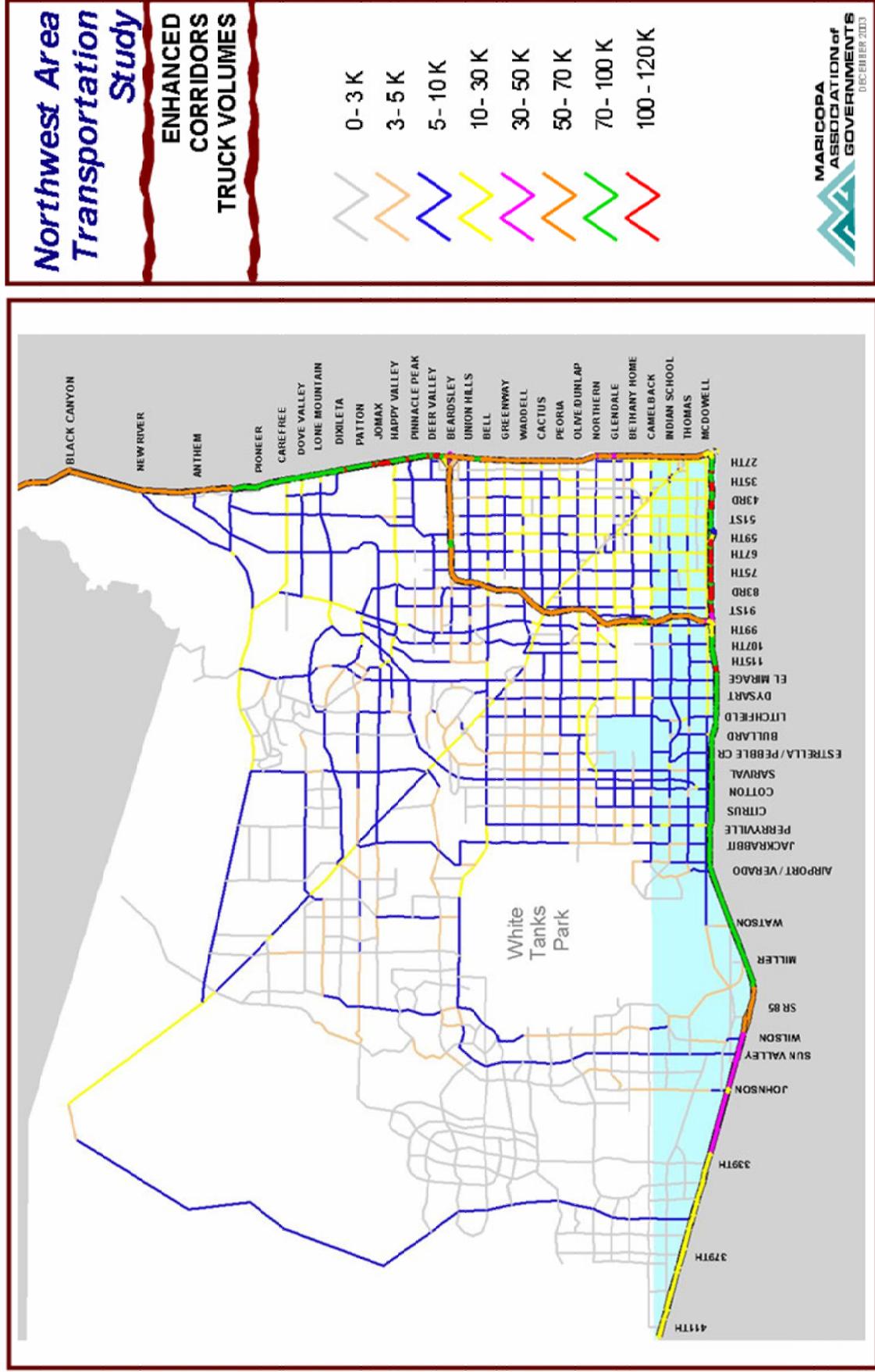


Figure 64: New Corridors Option A Truck Volumes

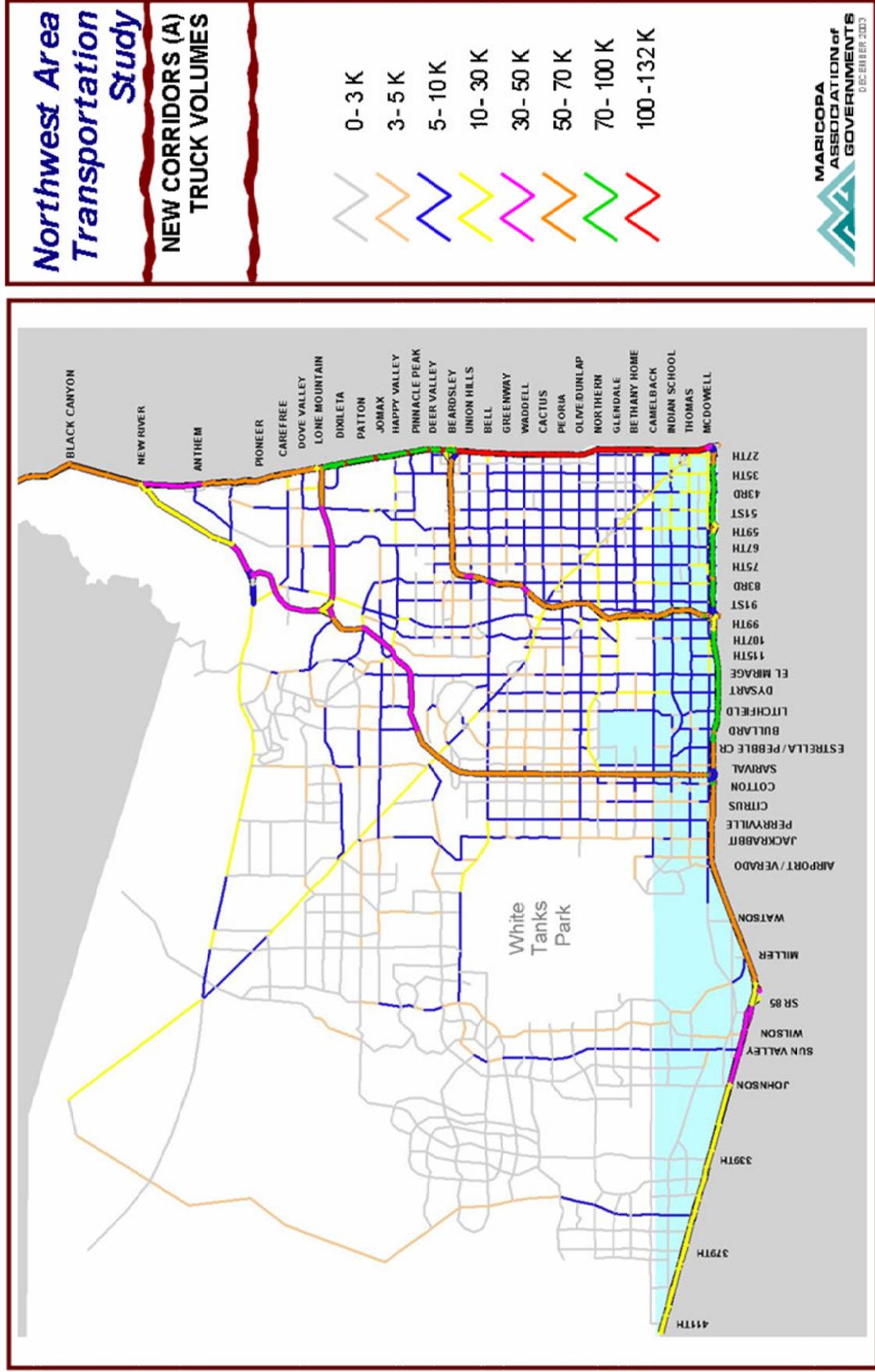
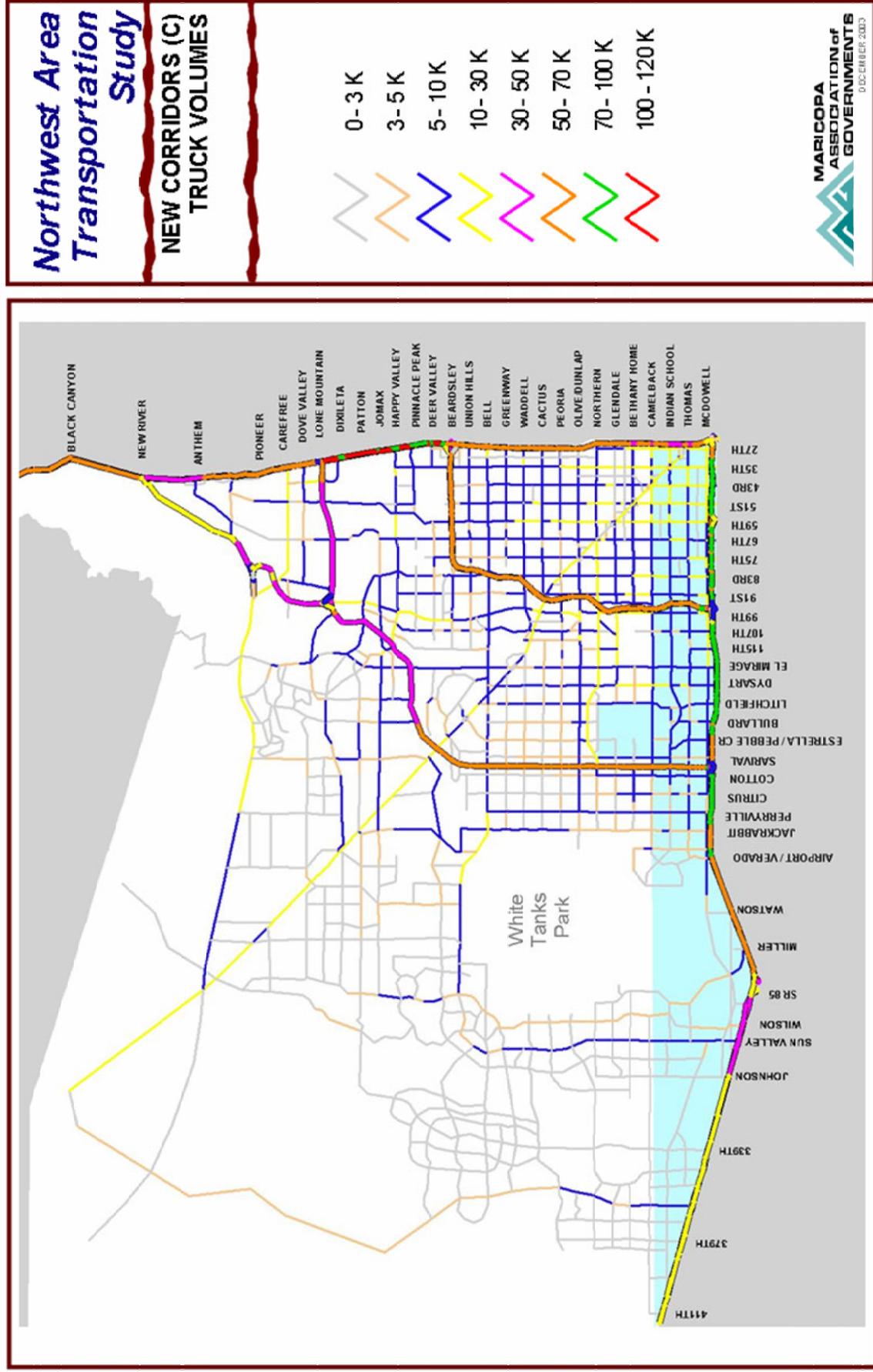


Figure 65: New Corridors Option C Truck Volumes



7.8 Model Run Conclusions

In analyzing the results of the regional travel demand model, there are a couple of key measures that help describe the performance of a facility or system.

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 range from A to F, in increasing order of congestion.

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, AM peak hour, and PM peak hour.

Volume to Capacity Ratio

The operating efficiency of a roadway segment can further be defined by comparing volume to capacity (v/c.) 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 v/c 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 32.

Table 32: 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

Analysis of Model Results

Not surprisingly, each set of improvements beyond the Future Base Network provides some benefit. As the major improvements are added to the plan, the modeling results show a marked improvement in level of service and a reduction of the number of lane-miles that show V/C greater than .9. Though many lane miles are added in the Future Base Network, the number of lane miles that reach V/C ratios above .9 grows more than tenfold. This is largely because the new corridors are primarily in the growing areas of the Northwest Valley, where they will support future growth. The increase in congestion is primarily located within already developed areas, where opportunities to add lane capacity are constrained by potential high impacts and costs. The elements of the Enhanced Network improve the performance of the system, reducing the congested lane-mile count by over 20%. The addition of new corridor improvements substantially reduces congestion impacts by an additional 45%. Comparable improvements are noted in the number of congested intersections. Tables 33 and 34 summarize salient model results for the various alternatives tested.

Table 33: Roadway Performance Measures

MEASURE	2002	FUTURE BASE	ENHANCED	NEW HIGHWAYS
VMT (million)	21	62	66	66
Lane Miles – V/C .9	250	2,800	2,200	1,200
Congested Intersections	99	456	409	281

This New Corridors analysis shows, however, that funding major roadway improvements, such as freeways and major corridors, have a much greater impact on congestion mitigation and improving overall system performance than smaller roadways.

Transit planning work currently underway includes a substantial number of new transit - corridors. However, at the time of this report, modeling information was not available from the High Capacity Transit Study or the Valley Metro Regional Transit System Study to establish their contribution to the performance of the overall transportation system. Results

from these transit studies will be considered in the RTP process.

Transit planning work currently underway includes a substantial number of new corridors. However, modeling information was not available to establish their contribution to the performance of the overall transportation system. These results, and any appropriate amounts of funding, will be included in the next phase of the RTP.

Contribution of other modes to congestion mitigation is less quantifiable. These modes however improve mobility and quality of life and should be viewed in that light.

8. Recommendations

The study developed recommendations for project priorities based on their anticipated contribution to the long-term effectiveness of the regional system. Recommendations from the Northwest Area Transportation Study will be considered and analyzed further as appropriate in the MAG Regional Transportation Plan (RTP). Potential projects identified and modeled were reviewed and ranked in terms of their contributions and benefits to improving the overall system.

Measures used for the assessment and ranking and the resulting modeled figures are listed in Table 34. The criteria place an emphasis on projects that carry major volumes of regional traffic, close critical gaps, or offer alternatives to single occupant travel in heavily congested corridors.

The list of key projects is further divided into three levels based on funding availability, support from the community, and timing. Some projects may be very important in the long term context of the RTP but may not be critical until a later date because they address program elements for which congestion or impacts are not anticipated until further growth occurs.

While there is no single interpretation about the relationship between need and cost, the type of project also offers suggestions for funding. For example, arterials in developing areas that serve new growth exclusively are likely to be funded largely from development contributions. Projects that take place on regional facilities in fully urbanized areas are more likely to qualify for regional funds.

8.1 Priority Projects

As a starting point, all key projects are discussed in terms of their performance within their functional categories. The roadway categories include freeways, expressways/superstreets and arterial roadway corridors. Expansion could take the shape of a simple roadway widening to the preservation of the corridor for future freeway construction. The transit categories include light rail/bus rapid transit, commuter rail and fixed route bus service. Bicycle/pedestrian projects cannot be measured by the same yardstick, but have been shown in all phases under the “options” category.

Alignments and other major design elements for new freeways, highways, and arterials are subject to change following the completion of needed location/design concept studies. Local plans affecting the arterial system are subject to change, particularly in rapidly-growing areas.

8.1.1 Freeways

Based on existing traffic volumes and future demand projections, freeways carry by far the largest number of vehicle trips. In this list, emphasis has been placed on those projects that have an immediate need and are likely to be justified in terms of cost. In general, the regional policy is also to acquire sufficient right-of-way to accommodate all lanes required on all freeways, including HOV lanes, but that HOV lanes should be built only when they are justified by demand.

Table 34: NWATS 2020 and 2030 Network Comparison

Measure	2000	2020				2030			
		Future Base	Enhanced	New Corridors (A)	New Corridors (C)	Future Base	Enhanced	New Corridors (A)	New Corridors (C)
Centerline Miles									
FREEWAY	114	135	140	178	196	135	140	178	196
HOV	22	27	97	91	97	27	97	91	97
STREET	993	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643
TOTAL	1,155	1,809	1,879	1,912	1,937	1,809	1,879	1,912	1,937
Lane Miles									
FREEWAY	567	710	1,063	1,655	1,630	710	1,063	1,655	1,630
HOV	545	54	215	194	217	54	215	194	217
STREET	3,146	7,197	7,348	7,245	7,245	7,197	7,348	7,245	7,245
TOTAL	3,859	7,919	8,626	9,094	9,092	7,919	8,626	9,094	9,092
Daily VMT									
FREEWAY	9,200,000	14,900,000	19,000,000	25,000,000	22,700,000	14,800,000	21,600,000	29,900,000	29,400,000
HOV	370,000	800,000	1,900,000	2,100,000	1,500,000	1,000,000	3,000,000	2,000,000	2,400,000
STREET	11,400,000	29,900,000	27,500,000	22,100,000	23,000,000	43,800,000	41,300,000	33,400,000	34,400,000
TOTAL	21,000,000	45,600,000	48,400,000	49,500,000	47,200,000	60,000,000	66,000,000	66,400,000	66,200,000
LOS (number of intersections)									
D	77	117	120	131	114	75	81	90	93
E and F	72	263	217	126	159	456	409	261	291
% congested	31%	52%	48%	46%	45%	62%	55%	41%	43%
Congested Lane Miles									
FREEWAY	42	202	119.81	46.77	75.8	317	306	184	217
HOV	--	23.8	12.3	1	8.8	33	75	21	29
STREET	222	1,052	556	263	356	2,414	1,851	832	937
% congested	7%	16%	8%	3%	5%	35%	26%	11%	13%
Hours of Delay									
FREEWAY	47,043	322,000	176,300	58,792	99,099	1,153,623	584,933	231,862	288,490
HOV		14,000	4,474	213	3,129	61,286	40,414	13,133	13,542
STREET	110,850	630,600	325,389	166,091	203,707	3,790,770	1,604,885	515,314	615,140
Average Speed									
FREEWAY	57	40	47	55	53	21	35	49	45
HOV	60	57	60	61	60	41	56	51	58
STREET	29	26	29	29	29	16	23	28	26

Freeway projects are recommended for:

I-10

Future demand is so high that a parallel facility, referred to as the "I-10 Reliever", to be located south of I-10 and extending between I-17 and SR 85, is being considered to

expand the corridor capacity⁹. The I-10 Reliever is projected in the SW Study to also

⁹ An I-10 Reliever roadway is proposed in the Southwest Area Transportation Study and the HCTS recommends evaluation of LRT/BRT along the I-10 Corridor. Designs for I-10 improvements should consider these needs.

carry over 300 thousand vehicles per day in some places, bringing the total volume carried by I-10 and the Reliever to over 600 thousand vehicles per day. On the other hand, I-10 has substantial space still available within its existing right-of-way that will permit the construction of additional lanes and possibly the inclusion of a high capacity transit line such as LRT or BRT. With some modifications near structures along the route, the benefit to be gained from work on I-10 by widening its lane capacity from its current directional 3 (west of Loop 101) or 3/4 (east of Loop 101) to 4 and 5, respectively, can be significant. ADOT is undertaking an I-10 Corridor Profile Study that will help define the opportunities and challenges within the corridor and the best way to accommodate the various competing demands for additional lanes and transit facilities.

West of the CANAMEX corridor, I-10 projected volumes for 2020 and 2030 (<30,000) do not identify it as a critical need compared to other parts of the corridor. It currently has the capacity to meet transportation needs into the foreseeable future.

In conjunction with added lanes, the addition of one more HOV lane along the entire length from I-17 to SR 85 could require more extensive modifications to the existing configuration. The further inclusion of an LRT line (an alternative specified in the MAG High Capacity Transit Study), even as a replacement for one HOV lane, could open the need for additional right-of-way. The provision of added HOV facilities as part of the roadway improvements to make alternative mode travel possible such BRT or express bus should occur at the same time as the added general purpose lanes.

From a timing perspective, the need is greatest east of Loop 101 for both general purpose and HOV lanes. The heaviest congestion occurs in this reach and is the greatest concern among motorists. Because the demand is still developing west of Loop 101, those improvements are appropriately delayed to a midterm phase of construction or added over a longer period of time. Under any scenario, given the anticipated demand, there will need to be a thorough evaluation of the I-10 Corridor before the final configuration of the freeway and the reliever can be understood.

Given the need for capacity in this corridor and its favorable condition to accommodate at least some of that demand, this is a very important choice in serving the Northwest and Southwest Valleys.

I-17¹⁰

As configured, the I-17 corridor is contained within a very tight right-of-way south of Loop 101. Any work in that area will be costly. While this freeway carries a very high volume of traffic, major improvements south of Peoria Avenue are probably too costly to qualify for early funding without major impact to the overall regional transportation plan. In the NWATS, a single additional general purpose lane is proposed to be added north of Peoria Avenue, consistent with the current LRTP. The MAG Bottleneck Study has identified possible options for the I-17 Corridor that range from widening the existing freeway to double-decking the freeway south of Loop 101. The final configuration will require substantial additional analysis. For purposes of determining a cost figure, \$1 billion was used to reflect the high cost without a specific project.

¹⁰ ADOT I-17 DCR/EA recommendations, including frontage roads, are included by reference.

North of Loop 101, growth will demand substantially more than the two lanes (each way) currently available. The proposal to add three additional lanes in each direction as far as Loop 303 and four lanes each way beyond that to New River can be phased in as development takes place and funding becomes available. While some immediate relief is needed, this is mostly a mid-term to long term project that will be timed to serve the demand as it rises. An HOV lane north of Loop 101 to New River should also be included in any mid-term project to widen the I-17 Freeway to establish the alternative mode corridor as the area grows.

Loop 101¹¹

The project identified in the NWATS for Loop 101 is the addition of a new general purpose lane (for a total of 4 each way) and one HOV lane each way. These improvements help to address the most congested part of the Northwest Valley. As growth continues, the level of service on the arterial system in the area bounded by Loop 101, I-10 and I-17 deteriorates substantially until capacity is added along the boundary corridors. Loop 101 is a relatively new facility, but one that will be called upon to mitigate some of the limitations of the rest of the system in the area. It will become overloaded in the near future (volumes well in excess of 200K per day) without additional capacity. This roadway also is and will be a main access to a variety of activity centers extant or under development in the Northwest Valley (e.g., Arrowhead retail district, Coyotes/Cardinals sport facilities and related improvements, etc.) that will demand improved linkages to the entire Valley.

¹¹ The recommendations of the ADOT Design Concept Reports for I-17 and Loops 101 and 303 are incorporated by reference.

Loop 101 general purpose lane construction should be a near term project. Because of its lower volume projections and high cost, the HOV lanes can be deferred to mid term if funding so requires, but they are best delivered at the same time.

Loop 303¹²

There are three main parts to Loop 303 in the NW study area: south of US 60 (Grand Avenue), north of US 60, and the New River Extension that connects to I-17 near New River. Thirty years from now, the section connecting to I-17 near Lone Mountain Road and the section connecting to I-10 near Cotton Lane will carry heavy volumes of vehicles (up to 250 thousand per day, each.) The Extension to New River will carry less (about 130 thousand per day). The volumes clearly identify a need for all segments of Loop 303 in the study area to be built ultimately to freeway standards. Each section of Loop 303 may however be constructed to expressway or parkway standards initially, with sufficient right of way obtained in the near-term for an ultimate freeway facility, and only upgraded to freeway standards later as demand warrants and funding is available.

The segment south of US 60 is the most critical section of Loop 303 given the demand it serves. On the basis of demand alone, it qualifies as a midterm project. Much of the right-of-way is already in hand and a substantial amount of the preliminary engineering work has been completed or is underway. This will simplify the process of building the project and it could offer significant benefits to the area if funding is available in the near term.

While the segment north of US 60 does not attract as much traffic in the near term, it is

¹² Ibid.

important to protect rights-of-way as development fills in within its vicinity. Where it is yet to be acquired, right-of-way protection should be a near term project for all of Loop 303. The segment from Grand Avenue to Lone Mountain Road is a midterm project, though an interim arterial level project is underway today between Grand Avenue and Lake Pleasant Road. Construction of the New River Extension as a freeway is a long term project. In keeping with the regional HOV policy on freeways, the Loop 303 freeway will also include an HOV lane. Based on anticipated volumes, it will not be needed until the long term, but must be accommodated in the design and right-of-way acquisition programs for the facility.

In all cases, there will have to be close attention paid to mitigation of local impacts as the various phases are constructed. Sound attenuation is expected to be a component of all freeway projects in the future (e.g., noise walls, rubberized asphalt, etc.) and cost estimates will have to account for those elements as a matter of course. The estimates used here include a minor accommodation for environmental mitigation, but will need to be reviewed in some detail at the time of actual design.

8.1.2 New and Reconstructed Interchanges

The improvement to the freeway system includes new interchanges, modifications to existing interchanges, and an HOV direct connection. The locations are also shown in Figures 66, 67, 68, and 69.

New interchanges are proposed on I-10 at the CANAMEX Corridor (in the vicinity of 355th Avenue pending a final alignment to be further defined in a future ADOT study) and Wilson Road west of the White Tank Mountains.

Other interchanges on I-10 are to be located at Bullard, Perryville Roads and El Mirage / Dysart Roads to improve access in the east of the White Tanks. A potential I-10 / El Mirage interchange and/or crossing will be the subject of further study as part of an El Mirage/Dysart arterial roadway corridor analysis. The El Mirage location is difficult to manage operationally and financially on the north side of the freeway because of proximity to adjacent interchanges, impact on local neighborhoods and a major Agua Fria River crossing.

I-10 will include a system interchange at the new Loop 303 that will also need to address access to Cotton Lane and Sarival Road.

A system HOV Connector system is proposed for I-10 at Loop 101 and an additional HOV interchange at 59th Avenue as well as completion of a full HOV interchange at 79th Avenue.

An I-10 Corridor Profile Study is currently underway by ADOT that may identify additional needs or help to refine results from this study and the RTP.

Improvements to I-17 are not yet fully defined south of Peoria Avenue, but new interchanges have been identified for Dove Valley Road and Jomax Road in North Phoenix. A system interchange at I-17 and Loop 303 near Lone Mountain Road will be part of the new freeway program for Loop 303 (including a half interchange at Dixileta/I-17 and a full interchange at 43rd Avenue/Loop 303) as well as a system interchange at I-17 and New River as part of the New River Extension.

I-17 will add an HOV Connector at Loop 101 and HOV ramps near Peoria to improve HOV circulation in the corridor and better serve the

MetroCenter park-and-ride facility. In addition to the HOV Connectors at I-10 and I-17, Loop 101 will provide HOV ramps at Maryland Road and 59th Avenue and a full interchange at Bethany Home Road.

Lastly, Loop 303 will provide access at appropriately spaced locations along the entire 33 mile route to intersecting arterials. When built, Loop 303 will also furnish system interchanges at the New River Extension and at Carefree Highway to accommodate potential new freeways in those corridors.

8.1.3 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 90 miles of freeway currently in operation in the Northwest Valley. 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. Applying this estimate, it would cost \$156 million to provide FMS/ITS features on the 156 miles of existing, potential, and programmed freeways within the study area.

The traffic signal systems and coordination in the Northwest Valley are operated independently by each city. With the exception of Phoenix and Glendale, there are no centralized signal control systems in the area. However, Glendale, Peoria and Surprise are planning to implement such systems in the near future. This will lead to

greater fragmentation which limits the opportunities for area wide implementation of signal coordination in the near future. Consistent with the MAG ITS Strategic Plan, Phoenix, Peoria, Surprise, and Glendale are part of the regional ITS program that encourages signal coordination across jurisdictional boundaries. These agencies will soon have the ability to provide traffic-related information to other neighboring cities and the State for incident identification/response and the prospect of interjurisdictional coordination of signals.

Another freeway operational feature that is currently in use is the Freeway Service Patrol. It is a cooperative effort among Department of Public Safety (DPS), Arizona Automobile Association (AAA), 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, 7 days a week. This service is currently programmed through fiscal year 2007. As freeway volumes grow and become more congested, it will be important to continue and expand this service.

8.1.4 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 provide 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, including restoration.

8.1.5 Expressways / Superstreets / Parkways / Arterial Roadway Corridors (ARC)

There is a lack of capacity within the arterial system in the Northwest Valley as a result of system discontinuities in a number of areas. Enhanced roadways that can carry greater volumes than roadways within the typical arterial hierarchy can help mitigate against grid breakdowns that occur at major developments or institutions (e.g., Sun City, Luke AFB.)

For planning purposes, new expressways are considered to have partial access control and to be upgradeable to freeway standards when demand warrants and funding becomes available. Parkways are similar in terms of immediate capacity but may have additional landscaping and beautification, and may or may not be upgradeable to full freeway standards. Super-streets are enhanced arterials. The regional model does not have categories for parkways or super-streets, so these facilities were typically modeled as expressways for this analysis.

The term “arterial roadway corridor” (ARC) refers to minimum four-lane facilities that operate as controlled access roadways, enhanced arterials (in the urban area), or possibly parkways, expressways or even standard arterials depending on future demand. In each case, an arterial roadway corridor will require a more detailed assessment to determine the exact location and configuration of the facility and may need to be treated as a multi-facility corridor in some cases.

Arterials generally provide local and not regional service. There are exceptions, however, where major regional movements rely on arterials because of limited or nonexistent alternatives. Some of these exist

in the Northwest Valley and are identified in the ARC category.

Grand Avenue

Grand Avenue (US 60) is a longstanding element of the roadway system that has defined travel in the Northwest Valley. It is relied upon for access to most cities in the area and continues to provide a “shortcut” to areas northwest of the urban core. Its orientation is a benefit as well as a challenge because it does not conform to the grid pattern of the subregion. On the other hand, it is the main non freeway component of the roadway system and will remain a critical part of the future transportation network.

The most traveled portion of Grand Avenue is divided into two parts: between I-17 and Loop 101, and between Loop 101 to Loop 303. Two recent studies have evaluated the needs in the corridor and identified the projects required to improve the capacity of Grand Avenue to handle substantially greater traffic volumes (up to 82k.) The Major Investment Study (MIS) completed in 1999 addressed the segment south of Loop 101. This segment is proposed to be a limited expressway and contains a series of grade separations and street closures to expedite traffic flow through critical intersections. This work is programmed or under construction using existing funding sources. Other locations, though not yet identified in the current plan for the corridor, are also of interest to further improve flow (e.g., grade separations at Indian School and McDowell Roads.) This part of Grand Avenue is a near term project.

A new MIS (Phase II) is currently underway to further refine the corridor needs between I-17 and Loop 101. Right-of-way preservation is identified north of Loop 202 to SR 74. The entire Grand Avenue Corridor, from Van Buren to Wickenburg is identified as an ARC

and will call for varying degrees of access control and additional study, particularly in northerly areas leading away from the urbanized area. The recently completed Grand Avenue Northwest Study between Loops 101 and 303 recommended specific improvements (e.g., widening, grade separations) and classified the roadway as an “enhanced arterial/limited expressway.”

This section of Grand will continue to serve both local and regional traffic. Major projects specified in the Grand Avenue NW study report include widening to six lanes, grade separations and the addition of ITS. At 45,000 to 65,000 vehicles a day, the 2030 traffic volume projections are still heavy, but not the volume of the section to the south east. On the other hand, it serves a rapidly growing area in Peoria and Surprise that is already heavily reliant on it and, despite improvements to Loop 101 and construction of Loop 303, will continue to be. The cost of \$135 million is relatively modest compared to others. This qualifies as a near term project in the Northwest Valley.

North of Loop 303, protection of right-of-way and widening to four lanes will be necessary, but as a midterm or long term project depending on the pace of growth in the area.

For budgeting purposes, funding of \$100 million was estimated for the mid-to-long term highway elements based on the analysis in the first Grand Avenue MIS completed in 1999 to address further needs in the corridor. It would cover additional bridges mentioned above and corridor beautification among other items.

Northern Avenue Superstreet (ARC)

The City of Glendale included a major roadway improvement along Northern Avenue among a long list of projects in their

transportation sales tax election in November 2001. The exact concept for the Northern Avenue Superstreet is still under development and requires discussions with neighboring communities, but it has been modeled as an expressway that can support a very high volume of vehicles (about 80 to 90K per day.) Such a roadway or limited expressway can help to offset some of the traffic carrying limitations of the arterial grid and provide a major east-west connection between Grand Avenue and Loop 303. Working in concert with Grand Avenue east and south of their intersection, Northern Avenue greatly improves access to and from the central urban core area. This relieves congestion on parallel facilities and establishes a regional corridor where one does not currently exist. The project is relatively expensive at well over \$200 million, but justifiable in light of the few options available in the area.

The Northern Superstreet is a midterm element of the program based on the need to further deliberate the configuration and regional cooperation elements of the project.

Carefree Expressway (ARC)

This project calls for right-of-way protection consistent with a freeway for the entire length of the roadway between I-17 and US 60¹³. In addition to future roadway widening, right-of-way preservation will also help to protect access and visual aesthetics along the scenic corridor. The segment that connects I-17 with the New River Extension of Loop 303 will serve anticipated growth in the North Phoenix area and provides a major east west connection to newly developing areas, but will remain a six-lane arterial. Though the volumes this corridor carries are significant,

¹³ Consideration as a future freeway with a system interchange at Loop 303 is subject to further ADOT analysis. It will remain an arterial between I-17 and Loop 303.

they are not projected to materialize until late in the forecast time period. Right-of way protection (and the means to make such protection possible if not found in current zoning or planning regulations) should be a high priority as development proceeds, but the construction of the expressway is a long term project subject at least in part to funding from development interests that will benefit from its new capacity.

Loop 303/Loop 101 Connector (ARC)

The proximity of the two freeways, Loops 101 and 303, in northern Peoria presents a challenge or an opportunity. Based on model output, traffic is expected to travel between the two facilities in search of “short cuts.” It can be facilitated or not facilitated. If not facilitated, the cut-through traffic that may occur is likely to lead to neighborhood impacts, as traffic seeking to transfer from one freeway to the other will end up using local streets. If the cut-through traffic is instead facilitated with an improved roadway that serves as a higher volume connection between Loops 101 and 303, there will be less potential impact to local neighborhoods.

The connection was modeled as an expressway, aligned along Lake Pleasant Road to Beardsley Road and connecting to Loop 101. A second expressway connection from Loop 303 along Happy Valley Road over to Lake Pleasant Road (which then connects to Beardsley / L101 as noted above) was also included. The combined connections attract a respectable volume (up to 75k, depending on the segment.) Because this project has potentially significant impacts on adjacent communities, it should be evaluated in detail as a regional connection very soon as a follow-on to other work to improve circulation in the general area (e.g., Loop 303.) The results of that analysis will dictate the viability of the facility and its priority. In the absence

of other information, the numbers place construction of this project as part of a mid to long term plan. Right of way protection should take place as early as possible, however, as the area is already under development.

Sun Valley Parkway (ARC)

Located in the far Northwest Valley, Sun Valley Parkway will need to be expanded to a six-lane arterial highway to support a major growth program in the Town of Buckeye. The timing of the need for the project will depend directly on the pace of development. Though Sun Valley Parkway offers a loop type connection around the White Tank Mountains in conjunction with Bell Road, its primary purpose is related to development in the area according to modeling results. The Department of Transportation (ADOT) would also like to evaluate a connection of Sun Valley Parkway to SR 85, south of I-10, to create a major corridor linkage between the growing areas of the Southwest and Northwest Valleys.

Sun Valley Parkway should be recognized as a major corridor in the far West Valley and rights-of-way for a parkway/expressway should be protected as the opportunity arises (or memorialized in the Town’s General Plan) to ensure availability of needed space in the future. It warrants six lanes, but can function as an arterial or parkway though it was modeled as an expressway. This is a long term project but could move more quickly if needed and funded by development.

CANAMEX Corridor (ARC)

The CANAMEX Corridor is modeled as an expressway between I-10 and US 93, but it attracts few trips by 2030 (in general, less than 2,500 per day). That demand and the demand projected for other vehicles in the corridor can be readily accommodated in a

four-lane roadway. CANAMEX is however, identified as a major future conveyor of truck traffic between Mexico and Canada and between states and regions within the U.S. Given the facility's significance in the regional and national long range transportation plans, it is recommended for preservation of rights-of-way consistent with a freeway.

The extent to which such traffic grows more rapidly than anticipated could dictate earlier timing for its implementation. In the interest of preserving the opportunity for its future construction and recognizing the expectation of development in Buckeye, the right-of-way preservation is justified before the need for the road. The right-of-way should be able to accommodate an expressway level roadway. CANAMEX is a long term project, but right-of-way acquisition/protection should occur within the near-term timeframe for already-owned public right-of-way and not later than mid-term for the remaining right-of-way.

Wickenburg Bypass (ARC)

The Town of Wickenburg has sought support for the bypass of its historic downtown. ADOT's cost estimate of the approximate 24-mile roadway is \$220 million and in terms of traffic volume priority in the region, the project ranks low. With that in mind, the town has focused on gaining support for the westerly portion of the bypass that represents the northerly segment of the adopted alignment of the CANAMEX Corridor which connects to US 93 and, as such, a significant future regional facility. That segment, though still low in projected volume, is as a result identified as a higher priority than the easterly portion of the bypass. As indicated in the discussion above for the CANAMEX Corridor, right-of-way sufficient for an expressway should be protected near- or mid-term.

El Mirage/Dysart Parkway (ARC)

There are few continuous north/south arterials in the Northwest Valley. Most regional trips require a circuitous path along arterials to travel from northern Peoria or Surprise to I-10. Even the freeways will not cross the entire sub-region until the Northern Extension to Loop 303 is built in the future. El Mirage Road links or will link Carefree Highway with Grand Avenue. Dysart Road connects Bell Road with I-10 and points south. The locations of the Sun City developments and the City of El Mirage prevent either from being extended to serve the entire distance alone. However, connecting the two at an appropriate midpoint near the City of El Mirage as a six-lane arterial would offer a major north-south connection to the region. This is consistent with the Grand Avenue Northwest study's conclusion for a possible grade separation of El Mirage Road /Thompson Road at Grand Avenue, though the exact alignment of roadway will require further study to address possible Title VI issues and local impacts. This is a mid to long term project subject to funding availability and the required analysis. Right of way preservation as needed should occur in the near term.

Jomax/Happy Valley Parkway (ARC)

Bell Road is the major east west arterial that crosses the entire Northwest Valley. It is already heavily congested east of Surprise and has little potential for major capacity enhancements. The linking of Jomax and Happy Valley Roads near Loop 303 as a regional arterial can offer a major six-lane east west connector arterial in one of the region's most active growth areas. It will remain a major arterial east of 67th Avenue.

This alignment will to a substantial degree be part of development efforts and should follow the pace of development. It is identified as a

mid to long term project pending growth activity. In keeping with the arterial roadway corridor concept, the recommendation is to protect right of way sufficient to accommodate an expressway/parkway through the cities' General Plans and development processes.

8.1.6 Bridges

As part of the improvement of the existing arterial highway system, there are certain key river crossings that should be provided to ensure continuity of key routes in the Northwest Valley.

Within the easterly portion of the study area, a crossing of the New River at Beardsley Road, in combination with a partial freeway interchange was identified as a key improvement. The new connection would provide access for west/southbound traffic (Loop 101 turns from westbound to southbound at Beardsley Road) to and from Loop 101 and Beardsley Road. Access to the north/eastbound freeway would be available at a "Texas U-Turn" along the north side of the existing Union Hills Road/SR 101 interchange immediately south of the proposed partial interchange.

Peoria Avenue over the Agua Fria was considered critical to circulation in the communities of El Mirage, Youngtown and Peoria. It provides a connection that closes a large gap in the arterial system. The current configuration forces significant out-of direction travel to cross the river.

In the southern area of the study on the Agua Fria River, new bridges are recommended at Indian School Road and Thomas Roads and a widening of the bridge at McDowell Road. The Indian School Road bridge is deficient and will require replacement. Thomas Road is a major link that will be difficult to complete, but which offers a crossing in a location that

will become congested as freeway volumes increase and development activity on the area continues. The McDowell Road bridge is in good condition, but, like Thomas will require more capacity to accommodate growing traffic demands in the area.

In the western NWATS area, the new corridor system will require a number of crossings of the Hassayampa River to accommodate the anticipated development activity in Buckeye that should be built into the cost of building the new corridor system. The exact location of the bridges will need to be evaluated as the area develops to ensure maximum utility for the new communities and good local support of the regional freeway system along I-10.

Similar cases will present themselves in the North Phoenix, Peoria and Surprise areas with projects such 67th Avenue over the CAP Canal which link new growth in those cities.

8.1.7 Other Roadway Items

There are policy matters that must also be taken into account in the future transportation plan. These are longstanding issues that will need to be addressed as regional solutions to the limitations of the arterial highway system. Funding has been identified as a generic cost to cover most of these system shortcomings.

Safety and Intelligent Transportation Systems

An assessment of the relative safety among the three planning scenarios was carried out as part of the study. This assessment clearly showed that the overall safety performance of the regional transportation system improved with additional freeway mileage in the system. However, in order to ensure that plan recommendations adequately address safety needs, and result in the safest possible transportation environment in the region, the following policies are recommended in the areas of safety and ITS:

Freeways

ITS: All future freeways and expressways are assumed to have full Freeway Management System (FMS) coverage. The capital cost of implementing FMS is estimated at \$750,000 to \$1,000,000 per mile. This essential feature in future freeways will have both capital and an on-going maintenance and operating cost component. The estimated operating and maintenance cost for FMS is about \$ 20,000 per mile per year.

Safety: All freeways and expressways with medians narrower than 75 feet should have concrete Jersey barriers, where practical, to prevent crossover crashes. For cost estimating purposes, it is assumed that half of all new freeway miles will occur in built up areas with limited right-of-way, hence narrower medians requiring barriers. Special consideration may be needed in some cases to provide for adequate median drainage, but the cost of implementing this is estimated at \$ 300,000 per mile, not including costs required to mitigate drainage or other issues.

The Freeway Service Patrol service should be expanded to cover all new freeways, at a minimum, during peak periods. The annual cost of this service is estimated at \$5000 per mile per year.

Arterials

ITS: All street traffic signals should be linked to centralized control systems at the local agency's Traffic Management Center. These systems should also be linked as possible to a region-wide system. All major arterials that carry heavy traffic flows should have full ITS coverage consisting of coordinated traffic signals, closed circuit television (CCTV) cameras, variable message boards, and street and freeway traffic information broadcast to in-vehicle devices. It is also anticipated that a funded strategy to clear

traffic incidents and crashes on the arterial system will be in place. The allocated cost of developing these new features in the study area arterial system has been set at \$100,000 per mile of new arterial.

Ideally, subject to legal limitations, these funds would be collected as part of the public agency capital improvement programs for construction of new roadways or as part of the development approval process and should be placed into a regional fund to implement ITS on a priority basis throughout the area.

Safety: All new arterials should incorporate features based on the best prevailing design practice for safe pedestrian and bicycle facilities. Recommendations in the MAG Pedestrian Design Guidelines, or its equivalent, should be considered at the time of implementation.

Arterial Grid Continuity

This is a policy item of high priority. The regional arterials discussed above and some of the expressways are designed to help mitigate the obstructions to expanding the arterial grid in portions of the highway system in the Northwest Valley. Though special projects have been defined for the existing limitations, a policy must be written and adopted to ensure roadway grid continuity in any future areas. This is a regional issue that needs to address the challenges of topography along with development concepts.

Scalloped Streets

The discontinuities that have resulted from the piecemeal construction of roadways along developing properties are also a key policy challenge. Scalloped streets should be addressed as a regional item as far as priority and possibly some funding, but they will continue to be a local responsibility regarding

implementation. This is particularly an issue with new road construction in unincorporated areas.

Preservation of Right-of-Way

To allow for the long term implementation of the Regional Transportation Plan roadway system, major facilities and key arterials must be protected from encroachment that prevents implementation of the plan. This has been addressed in some projects where the timely acquisition of the right-of-way may be more important than the actual construction of the project, but it should also be addressed as a policy item to prevent development or other projects from limiting long term options. An example is the northern segment of Loop 303 (north of US 60) where the need is a mid term project, but the right-of-way should be preserved as soon as possible to prevent encroachment and provide clear notice of the long term intent for the facility. Similar preservation issues may exist for many of the key arterials as well.

A regional funding allocation is proposed in each of the near, mid and long term listings to cover such costs from a regional source to prevent the loss of options in the arterial system. Another parallel policy option is for cities to adopt the larger facility designation (e.g., parkway or expressway) into their General Plans to establish the basis for legitimate development exactions at the appropriate time.

Avoid T-Intersections and Six-Legged Intersections

Where two major roadways, freeways in particular, connect across another, there should be single interchange. Offset interchanges create major circulation challenges and have a major impact on highway capacity. One example in the NWATS area is the possible future

connection of SR 85 with Sun Valley Parkway across I-10. This connection will be subject to further assessment, but should there remain a four to five mile “disconnect” between the two primary north-south links through Buckeye, it will seriously impair the ability of I-10 to accommodate its normal traffic as it will also be required to handle all north south trips.

8.1.8 Transit Projects

There are substantial efforts underway to define an expanded transit system throughout the region. Projects under study include high capacity transit (i.e., light rail transit, bus rapid transit, commuter rail) as well as a major expansion of fixed route transit and paratransit services. The final determination of the proposed system elements will be largely defined by studies currently underway at MAG and RPTA, but recommendations in this report are presented based on preliminary information from the two studies to reflect a potential multimodal system. Each transit system element in the Northwest Valley is addressed individually using the preliminary results of the High Capacity Transit Study (HCTS) and the Regional Transit Systems Study (RTSS.) Final decision on recommendations including priorities and funding will be made as part of the MAG RTP process.

It should also be noted that because the modeling timeframe for the transit studies was 2040, as opposed to 2030 for the highway projections, the identified implementation periods for some high capacity transit projects have been adjusted to be more consistent with the highway implementation terms. Costs of some of the high capacity projects are likely to have an influence over how these projects are ultimately prioritized. The results here are shown as a means of addressing a first cut at a multimodal plan. In general, because of the long lead time and high cost of some transit projects, a near term HCTS project will be more compatible with a mid

term highway project though in the interest of indicating priority, they may be shown in the same stated time period.

High Capacity Transit

The High Capacity Transit Study (HCTS) has identified multiple corridors for possible deployment of light rail, bus rapid transit or commuter rail and a recommended three-level priority treatment. These are high cost projects designed to offer alternatives to the single occupant vehicle. In the HCTP, the priority was determined largely by ridership potential, linkages to the committed high capacity network and the cohesiveness of the overall network. Their priority may change in the RTP process, but for purposes of this report, the following HCTS projects are excerpted from regionwide recommendations for the Northwest area:

- BNSF – Downtown Phoenix to Loop 303 Commuter Rail/BRT. The Grand Avenue MIS Phase II will evaluate transit needs in greater detail and make recommendations for transit along Grand Avenue south of Loop 101.
- Glendale Avenue Extension LRT
- I-10 West Corridor LRT. This will require further coordination with ADOT in the I-10 Corridor as improvements are defined for that area.
- MetroCenter/I-17 LRT
- I -17 Corridor LRT/BRT
- 59th Avenue – Bell Road to I-10 West LRT/BRT
- Bell Road – I-17 to Loop 303 LRT/BRT

Fixed Route Transit

The results of the Regional Transit Systems Study will determine the manner in which priority is assigned in the regular bus route system. In the Northwest, the emphasis should be placed on helping to relieve

congestion on the arterial highway network. Most of the fixed route demand will be in the most heavily urbanized portions of the study area and deployment should occur in the first two terms to maximize the benefit of the service in congested areas. Bus system expansion is relatively inexpensive and the recommendation is to deploy all identified service within the short and midterm portions of the program (subject to final results of the RTSS.)

8.1.9 Non-Motorized Projects

The estimated costs of the regional bicycle system expansion are proposed to be divided among the short, mid and long terms as a line item in each that must be considered in the development of the overall multimodal plan. The allocation of funds to specific projects should be justified by:

- extension of existing regional elements;
- new linkages of existing regional elements;
- new regional system elements; and
- agreement of multiple agencies.

Figure 60 shown previously depicts the recommendations for non-motorized, off-road projects. A thorough evaluation of these options is recommended to properly define the ultimate configuration of the system. (Note: Because the costs of on-street facilities are part of the underlying street infrastructure, they have not been identified separately as priority projects. Their absence should, however, not be taken to imply they carry reduced significance. They are and will be an integral part of the non-motorized system.)

8.1.10 Cost Estimates

Preliminary estimates are provided for all projects. These estimates are preliminary and subject to change in the final RTP. Contingency allowances have not been included in the estimates but are expected to

be included in the estimates developed for the RTP.

Capital Costs

Capital Costs were estimated in a manner consistent with the other subarea studies based on a project type average cost table (See table 35.) Where more detailed project specific estimates were available, they were used instead of the table. More refined information is being developed in the Regional Transportation Plan.

Operating Costs

The focus of the NWATS was on identification of the capital projects that would be considered in the development of the RTP.

Costs associated with projects identified in this report are only for capital development. Annual costs will be deferred to the RTP as part of the region wide need to assess the implications of operations and maintenance funding on the future of the transportation system as a whole.

Summary of Draft Priority Categories

Table 36 on the following page and Figure 66 are summaries depicting total recommended projects. Cost tables and maps for each of the recommendations phases, i.e., short-, mid-, and long-term, are provided following Figure 66. Cost and phasing are subject to change in the RTP process.

Table 35: Capital Cost Assumptions

COST ITEM (cost per mile unless indicated)	CONSTRUCTION	RIGHT OF WAY	TOTAL
FREEWAY CONSTRUCTION			
New	25	15	40
Add 2 lanes	8		8
Add HOV lanes	6		6
New TI (ea.)	13	3	16
New system TI (ea.)	90	10	100
System HOV Connector (ea. TI)	35		35
TI reconstruction (ea.)	7		7
EXPRESSWAY/PARKWAY/ARTERIAL ROADWAY CORRIDOR (ARC)			
Widen 2-4 lanes	3.5	1	4.5
Widen 2-6 lanes	5	1.5	6.5
ROW Preservation on New Corridor		7.5	7.5
ROW Preservation on Existing 4-Lane		3.5	3.5
ARTERIAL			
New 4 lane	3	1	4
New 6 lane	4	1.5	5.5
Widen 4-6 lanes	3.5	1	4.5
ITS	0.1		0.1
TRANSIT			
High Capacity Corridors	From MAG High Capacity Transit Study		
Fixed Route and Paratransit	From Valley Metro Regional Transit Systems Study		
NON MOTORIZED			
Off Road Bikeway	0.5	0.2	0.7
<i>Note: Actual cost estimates were used where they are available</i>			

Table 36: Priority Summary

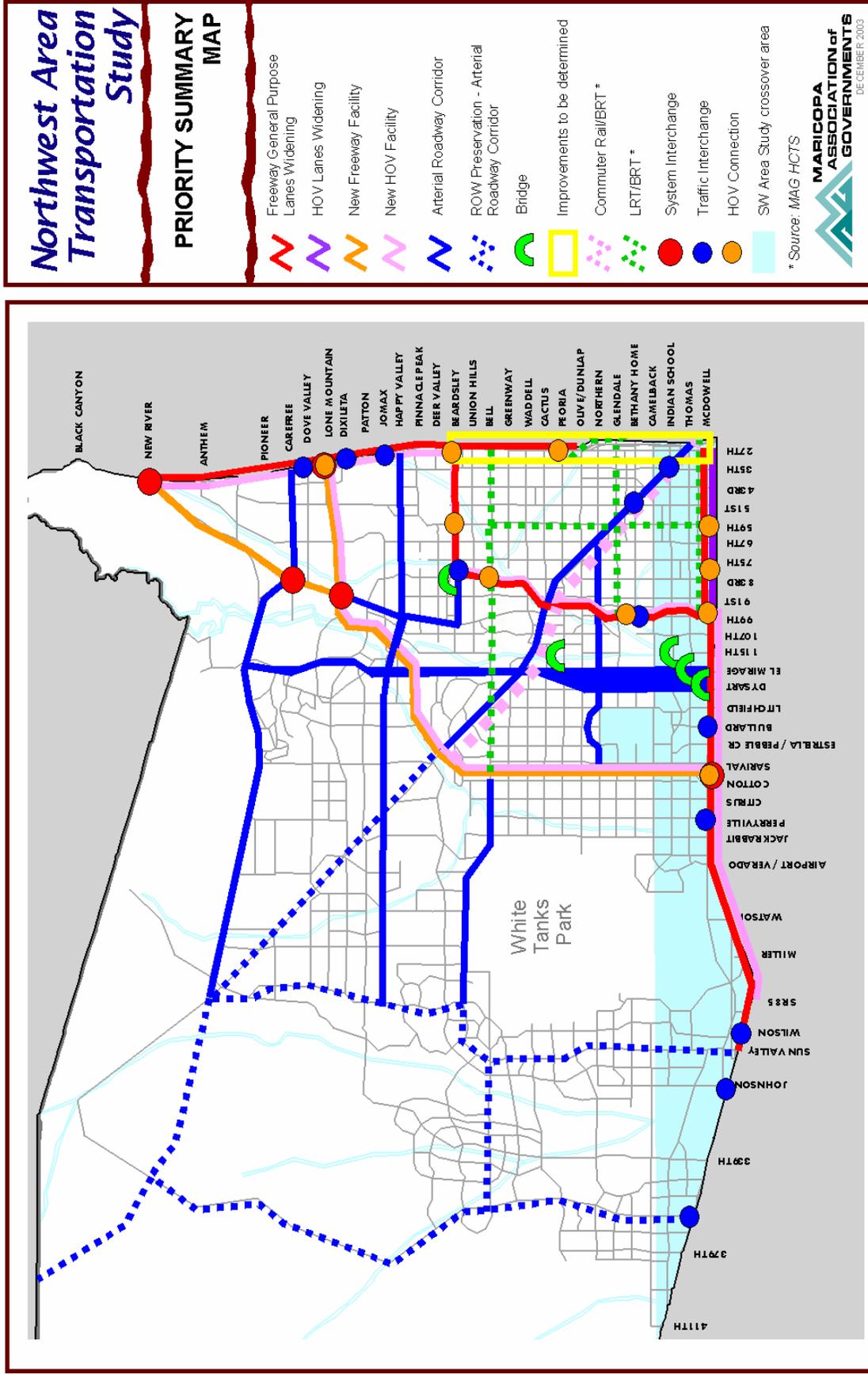
All Priority Projects		Lanes Added (each direction)	Total lanes (each direction)	Project Cost in millions (Cost estimates will be refined in RTP)	Totals
I-10	Freeways (includes Freeway Management System) I-10 General Purpose Lanes Widening (I-17 to Loop 101) I-10 HOV Lanes Widening (I-17 to Loop 101) I-10 General Purpose Lanes Widening (Loop 101 to Sun Valley Parkway) Bullard TI Perryville TI Wilson TI Johnson TI CANAMEX TI (355th Avenue) I-10 HOV Lanes Widening (Loop 101 to SR 85) 79th Ave HOV ramps (west) 59th Ave HOV ramps	1	5	\$540	
		1	2	\$194	
		3	5	\$552	
				\$16	
				\$16	
				\$16	
				\$35	
				\$126	
				\$8	
				\$15	
			Subtotal I-10	\$1,534	
I-17	I-17 General Purpose Lanes north of Loop 101 to Loop 303 I-17 General Purpose Lanes north of Loop 303 to Black Canyon City Dove Valley TI Jomax TI Peoria Avenue HOV ramps I-17 HOV Lanes north of Loop 101 to New River I-17 General Purpose Lanes south of Loop 101, north of Dunlap I-17 south of Loop 101 to I-10	3	5	\$156	
		2	4	\$133	
				\$16	
				\$16	
				\$16	
				\$102	
		\$280			
		TBD	TBD	\$1,000	
			Subtotal I-17	\$1,719	
Loop 101	Loop 101 General Purpose Lanes widening Beardsley ramps Bethany Home TI Loop 101 HOV lanes Loop 101 HOV Connectors to I-10 Loop 101 HOV Connectors to I-17 59th Ave HOV ramps Bell Road HOV ramps Maryland HOV ramps	1	4	\$176	
				\$8	
				\$16	
		1	1	\$132	
				\$35	
				\$35	
				\$15	
				\$15	
				\$15	
					Subtotal Loop 101
Loop 303	Loop 303 south of US 60 System TI at I-10 Right of way preservation north of US 60 Loop 303 north of US 60 System TI at I-17 (at Lone Mountain), including Ties at 43rd Ave., Dixileta and Dove Valley Loop 303 HOV lanes HOV Connector at I-17 HOV Connector at I-10 Loop 303 - New River Extension System TI at Loop 303 (New River extension) System TI at I-17 (at New River) System TI at Carefree Hwy	4	4	\$495	
				\$54	
				\$180	
		4	4	\$611	
				\$90	
		1	1	\$216	
				\$35	
				\$35	
		3	3	\$142	
				\$238	
		\$70			
		\$70			
			Subtotal Loop 303	\$2,286	
					Freeway Total
					\$5,986

Table 36: Priority Summary (continued)

Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (including \$100,000/mile for ITS) - Potential Freeway		1	2	
Carefree Highway (US 60 to Loop 303 in freeway right of way)				\$468
Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (including \$100,000/mile for ITS)				
Grand Avenue s/o Loop 101 (additional grade separations)				
Grand Avenue - Loop 101 to Loop 303	1	3		\$100
Grand Avenue (Loop 303 to Sir 74) right of way preservation	1	1		\$134
Northern Avenue Superstreet	2	4		\$67
El Mirage/Dysart Roads	1 to 2	3		\$256
Carefree Parkway (Loop 303 New River Extension - I-17)	2	3		\$126
Loop 101/Loop 303 Connector Expressway	1	3		\$39
Sun Valley Parkway	1	3		\$25
Sun Valley Parkway extension north of Bell Road	3	3		\$124
Bell Road (Sun Valley to Loop 303)	2	3		\$62
Happy Valley/Jomax Roads	1 to 3	3		\$54
CANAMEX (row preservation)	2	2		\$144
New or widened river bridges at Peoria, Thomas, Indian School, and McDowell Roads	2	2		\$230
Wickenburg Bypass	2	2		\$45
				\$220
ESPA Total				\$2,094
High Capacity Transit - from High Capacity Transit Study (HCTS)				
Grand Avenue - (Commuter Rail/BRT) (HCTS mid and long term)				\$739
Glendale Avenue (LRT/BRT) (HCTS near and mid term)				\$430
I-10 West (LRT) (HCTS near term)				\$400
Metrocenter/I-17 (LRT) (HCTS near term)				\$340
59th Avenue - I-10 (LRT/BRT) (from HCTS mid and long term)				\$518
Bell Road - I-17 to Loop 303 (LRT/BRT) (from HCTS near and long term)				\$371
HCT Total				\$2,798
Fixed Route Transit - from Regional Transit Systems Study (RTSS)				
Buses				\$132
Park and Ride Lots				\$83
Stations				\$14
Fixed Route Total				\$229
Non-motorized (Bicycle/Pedestrian)				\$200
Other Items				\$225
Program Total				\$11,532

Notes: Auxiliary lanes are not counted in one-way total. Costs and phasing are preliminary and subject to change in the final RTP.

Figure 66: Priority Summary Map



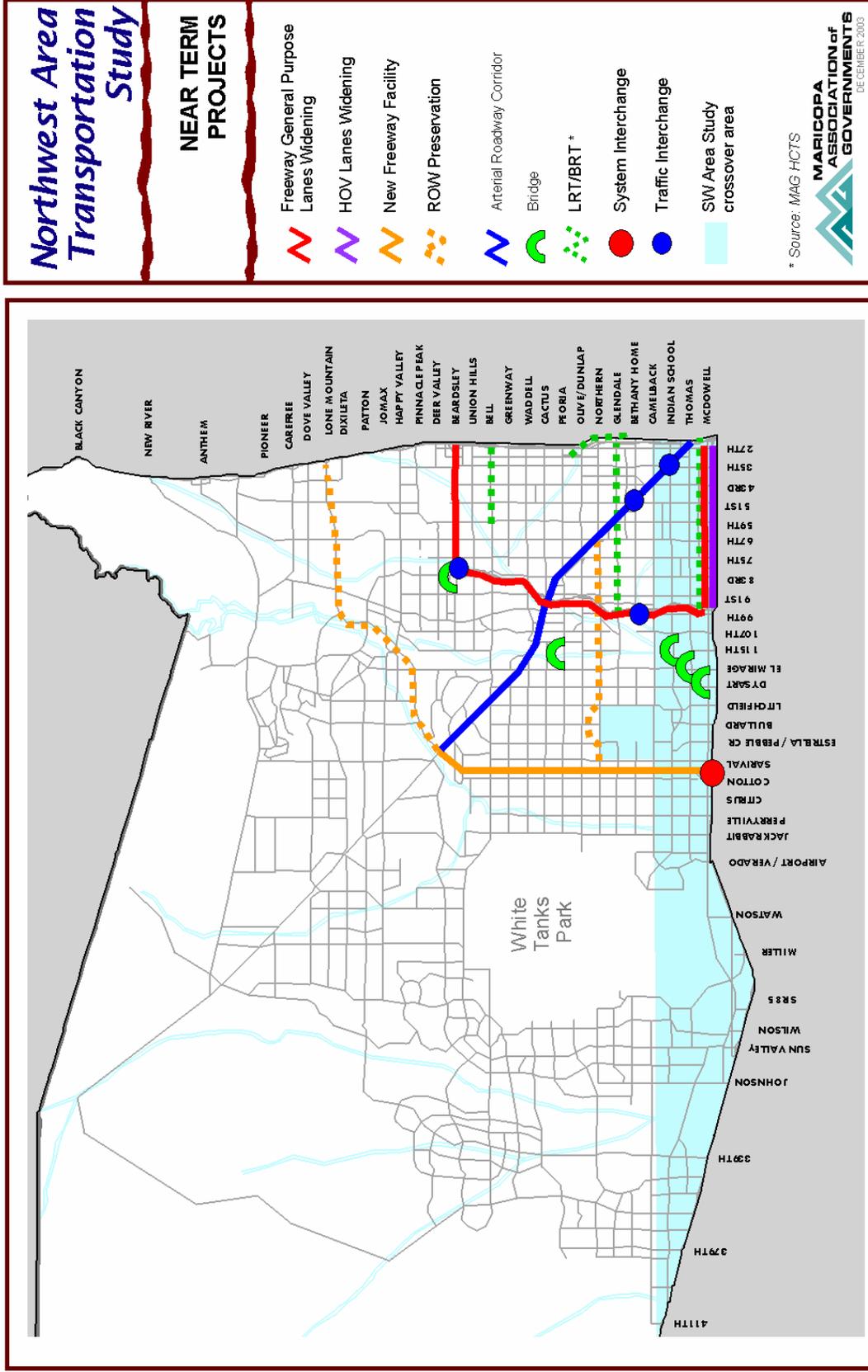
Alignments and other major design elements for new freeways, highways, and arterials are subject to change following the completion of needed location/design concept studies. Local plans affecting the arterial system are subject to change, particularly in rapidly-growing areas.

Table 37: Near Term Projects

Near Term Projects	Lanes Added (each direction)	Total Lanes (each direction)	Project Cost in millions (Cost estimates will be refined in RTP)	NWATS Short Term Total (millions)
Freeways (includes Freeway Management System)				
I-10				
I-10 General Purpose Lanes Widening (I-17 to Loop 101)	1	5	\$540	
79th Ave HOV ramps (west)			\$8	
I-10 HOV Lanes Widening (I-17 to Loop 101)	1	2	\$194	
Loop 101				
Loop 101 General Purpose Lanes widening	1	4	\$176	
Bethany Home TI			\$16	
Beardsley TI			\$8	
Loop 303				
Loop 303 south of US 60	4	4	\$495	
System TI at I-10			\$70	
Loop 303 north of US 60 preservation of right-of-way			\$180	
			Subtotal	\$1,687
Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (including \$100,000/mile for ITS)				
Grand Avenue s/o Loop 101 (additional grade separations)				
Indian School TI			\$50	
Bethany Home TI			\$50	
Grand Avenue - Loop 101 to Loop 303	1	3	\$134	
w/widened river bridges at Peoria, Thomas, Indian School, and McDowell Roads			\$45	
Northern Avenue preservation of right-of-way			\$40	
			Subtotal	\$319
High Capacity Transit - from High Capacity Transit Study (HCTS)				
I-10 West LRT (HCTS near term)			\$400	
Glendale Avenue LRT (HCTS near term)			\$430	
Metrocenter/I-17 LRT (HCTS near term)			\$340	
Bell Road - 59th Avenue to I-17 (HCTS near term)			\$114	
			Subtotal	\$1,284
Fixed Route Transit - from Regional Transit Systems Study (RTSS)				
Buses			\$72	
Park and Ride Lots			\$60	
Stations			\$14	
			Subtotal	\$146
Nonmotorized (Bicycle/Pedestrian)			\$60	
			Subtotal	\$60
Other Items				
Arterial grid/scalloped street program/safety			\$75	
			Subtotal	\$75
Total Near Term				\$3,511

Notes: Auxiliary lanes are not counted in one-way total. Costs and phasing are preliminary and subject to change in the final RTP.

Figure 67: Near Term Projects



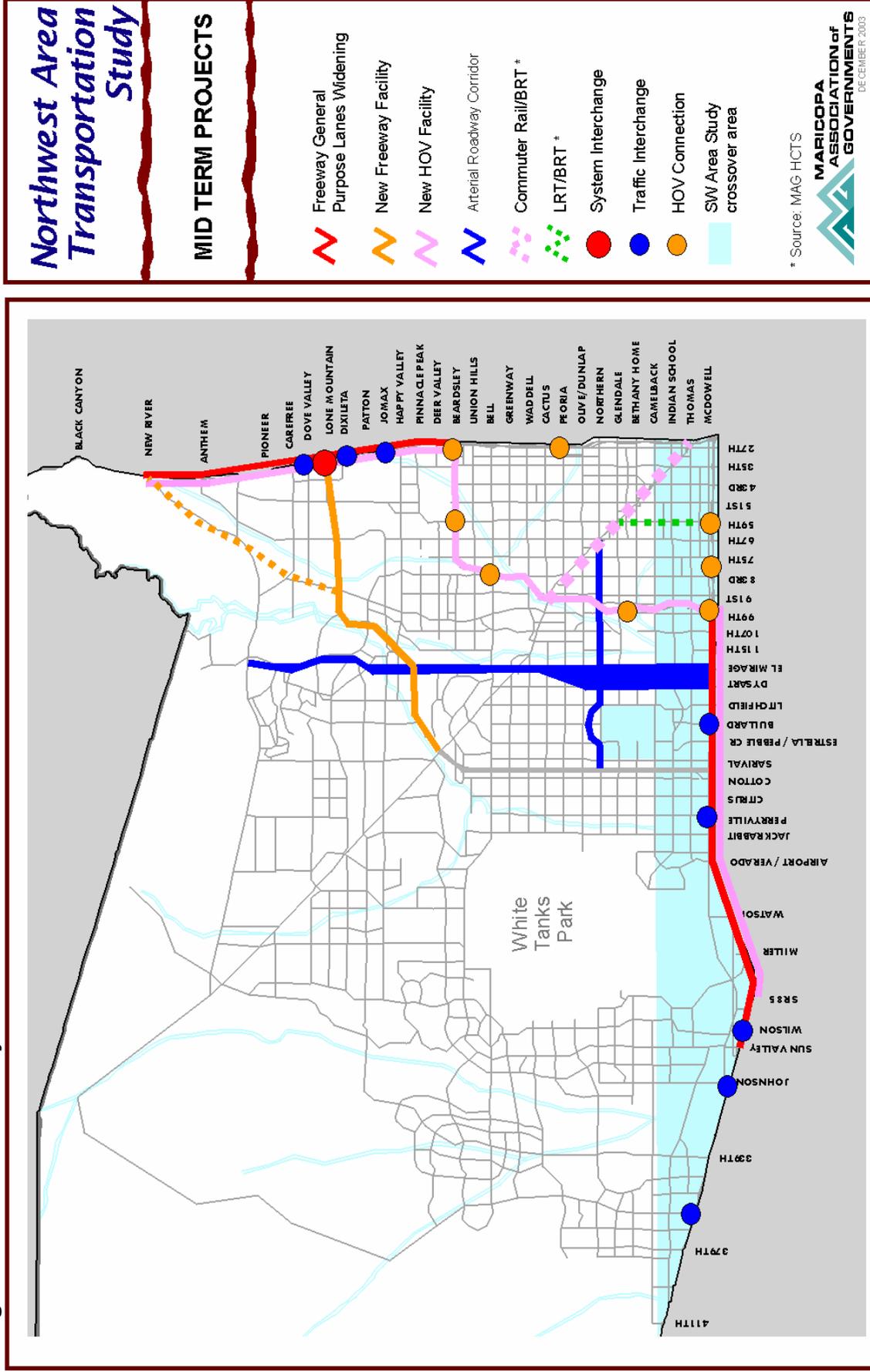
Alignments and other major design elements for new freeways, highways, and arterials are subject to change following the completion of needed location/design concept studies. Local plans affecting the arterial system are subject to change, particularly in rapidly-growing areas.

Table 38: Mid Term Projects

Mid Term Projects	Lanes Added (each direction)	Total Lanes (each direction)	Project Cost in millions (Cost estimates will be refined in RTP)	NWATS Mid Term Total (millions)
Freeways (includes freeway management system)				
I-10				
I-10 General Purpose Lanes Widening (Loop 101 to Sun Valley Parkway)	3	5	\$552	
Bullard TI			\$16	
Perryville TI			\$16	
Johnson TI			\$16	
Wilson TI			\$16	
CANAMEX TI (355th Avenue)			\$35	
I-10 HOV Lanes Widening (Loop 101 to SR 85)	1	1	\$126	
59th Avenue HOV ramps			\$15	
Loop 101				
Loop 101 HOV lanes	1	1	\$132	
Loop 101 HOV Connectors to I-10			\$35	
Loop 101 HOV Connectors to I-17			\$35	
59th Ave HOV ramps			\$15	
Bell Road HOV ramps			\$15	
Maryland HOV ramps			\$15	
I-17				
I-17 General Purpose Lanes north of Loop 101 to Loop 303	3	5	\$156	
I-17 General Purpose Lanes north of Loop 303 to New River	2	4	\$133	
Dove Valley TI			\$16	
Jomax TI			\$16	
Peoria Avenue HOV ramps			\$16	
I-17 HOV Lanes north of Loop 101 to New River	1	1	\$102	
Loop 303				
Loop 303 north of US 60	4	4	\$611	
m TI at I-17 (at Lone Mountain including TI at 43rd Ave and partial TI at Dixileta)			\$90	
Loop 303 - New River Extension - preservation of right-of-way			\$142	
			Subtotal	\$2,321
Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (including \$100,000/mile for ITS)				
Northern Avenue Superstreet	2	4	\$216	
El Mirage/Dysart Roads	1 to 2	3	\$126	
			Subtotal	\$342
High Capacity Transit - from High Capacity Transit Study (HCTS)				
Grand Avenue - Phase 1 (Commuter Rail/BRT) (HCTS mid term)			\$293	
59th Avenue LRT/BRT - Glendale Ave to I-10 West (HCTS mid term)			\$216	
			Subtotal	\$509
Fixed Route Transit - from Regional Transit Systems Study (RTSS)				
Buses			\$60	
Park and Ride Lots			\$23	
			Subtotal	\$83
Nonmotorized (Bicycle/Pedestrian)				
			Subtotal	\$40
Other Items				
Arterial grid/scalloped street program/safety			\$75	
			Subtotal	\$75
Total Mid Term				\$3,370

Notes: Auxiliary lanes are not counted in one-way total. Costs and phasing are preliminary and subject to change in the final RTP.

Figure 68: Midterm Projects



Alignments and other major design elements for new freeways, highways, and arterials are subject to change following the completion of needed location/design concept studies. Local plans affecting the arterial system are subject to change, particularly in rapidly-growing areas.

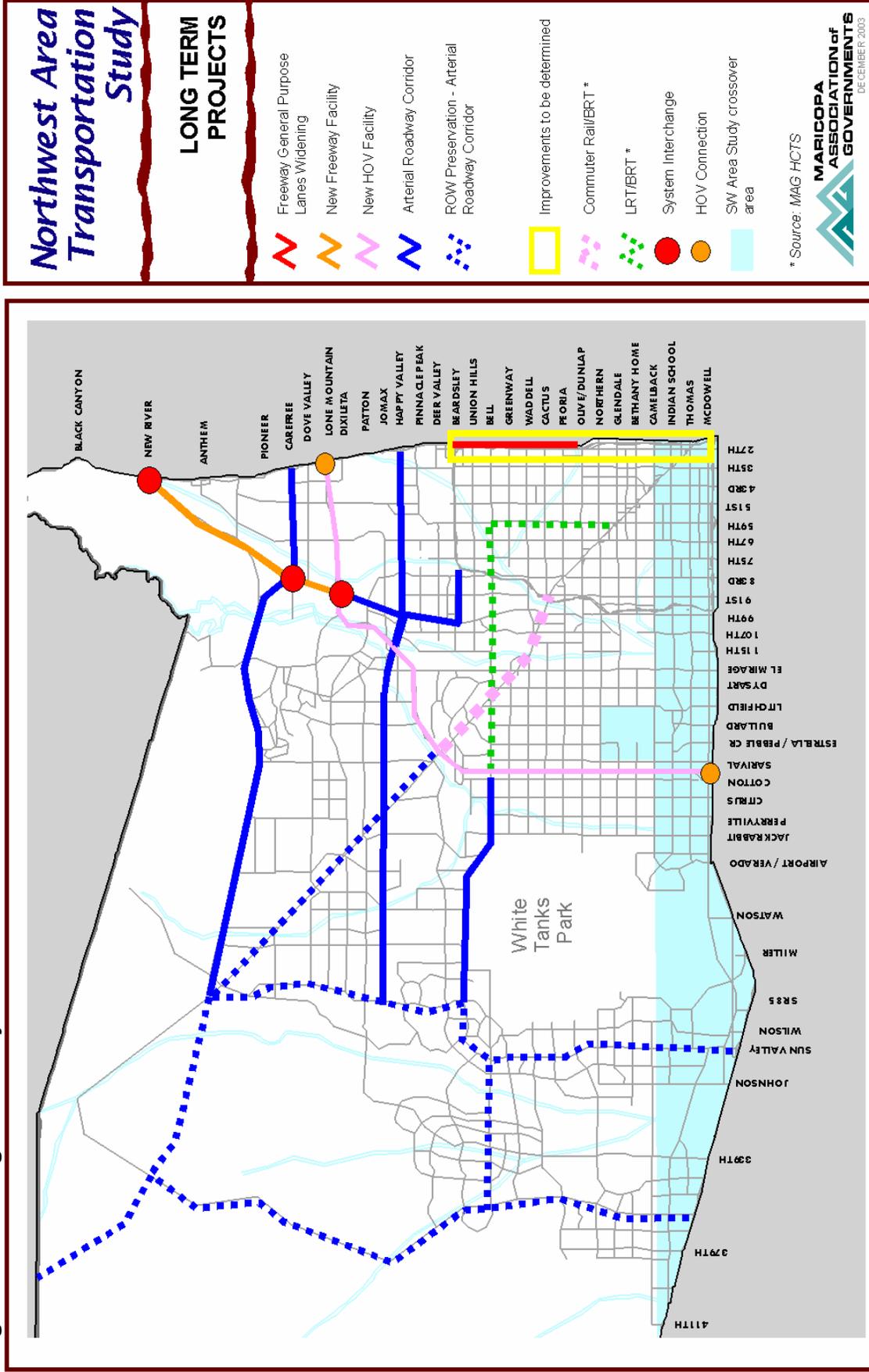
Table 39: Long Term Projects

Long Term Projects	Lanes Added (each direction)	Total Lanes (each direction)	Project Cost in millions (Cost estimates will be refined in RTP)	NWATS Long Term Total (millions)
Freeways (includes FMS)				
Loop 303				
Loop 303 HOV lanes	1	1	\$216	
HOV Connector at I-17			\$35	
HOV Connector at I-10			\$35	
Loop 303 - New River Extension	3	3	\$238	
System TI at Loop 303			\$70	
System TI at I-17 (at New River)			\$70	
System TI at Carefree Hwy			\$50	
I-17				
I-17 General Purpose Lanes south of Loop 101, north of Peoria	1	4	\$280	
I-17 south of Loop 101 to I-10	TBD	TBD	\$1,000	
			Subtotal	\$1,994
Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (incl. \$100,000/mile for ITS) - Potential Freeway				
Carefree Highway (US 60 to Loop 303 New River Extension)*	1	2	\$468	
Expressways/Superstreets/Parkways/Arterial Roadway Corridors (ARCS) (including \$100,000/mile for ITS)				
Carefree Parkway (Loop 303 New River Extension - I-17)	2	3	\$39	
Loop 101/Loop 303 Connector Expressway	1	3	\$25	
Sun Valley Parkway	1	3	\$124	
Grand Avenue (Loop 303 - SR 74) right of way preservation	1	1	\$67	
Sun Valley Parkway extension north of Bell Road	3	3	\$62	
Bell Road (Sun Valley Extension to Loop 303)	2	3	\$54	
Happy Valley/Jomax Roads	1 to 3	3	\$144	
CANAMEX (right-of-way preservation)*	2	2	\$230	
Wickenburg Bypass (west of CANAMEX)*	2	2	\$102	
Wickenburg Bypass (east of CANAMEX)	2	2	\$118	
			Subtotal	\$1,433
High Capacity Transit - from High Capacity Transit Study (HCTS)				
59th Avenue LRT/BRT - Bell Road to Glendale Avenue (HCTS long term)			\$302	
Bell Road - 59th Avenue to Loop 303 (LRT/BRT) (HCTS long term)			\$257	
Grand Avenue - Phase 3 (HCTP long term)			\$446	
			Subtotal	\$1,005
Nonmotorized (Bicycle/Pedestrian)				
			\$100	
			Subtotal	\$100
Other Items				
Arterial grid/scalloped street program/safety minimum allocation			\$75	
			Subtotal	\$75
Total Long Term				\$4,607

* Assumes freeway width right-of-way

Notes: Auxiliary lanes are not counted in one-way total. Costs and phasing are preliminary and subject to change in the final RTP.

Figure 69: Long Term Projects



Alignments and other major design elements for new freeways, highways, and arterials are subject to change following the completion of needed location/design concept studies. Local plans affecting the arterial system are subject to change, particularly in rapidly-growing areas.

8.1.11 Other Plan Considerations

Other items to be considered include policy matters such as eliminating scalloped streets, protecting and expanding the arterial grid and preserving right of way which should be viewed as near term items given the implications they have on future system development. These will require coordination among MAG members and possibly modification to local regulations.

Funding allocation will need to be addressed as a line item in any future revenue program. Ideally, right-of-way preservation and

scalloped streets would have a dedicated source of funding that could be accessed when a critical regional need arises (similar to the funding for the Red Letter process in the Regional Area Road Fund program.) The amount proposed in this report is \$50 million for each of the three time periods.

Arterial grid expansion is intended to be more of a prioritization process within the implementation program that would offer higher ranking to projects that help close regional arterial gaps or mitigate regional arterial deficiencies.

Appendix 1: Review of Previous Studies

Summary of General Studies

REGIONAL PLANS

FY 2002-2006 Transportation Improvement Program

This is the annual plan prepared by MAG to serve as a five-year regional guide to the funding and implementation of a transportation capital improvement program that will support preservation, management and expansion of public transportation services including highways, arterials, transit demand management and alternative mode improvements in Maricopa County. TIP projects are taken from the Long Range Transportation Program, the Short Range Transit Plan and from individual member communities' own programs. The plan covers five years of projects with identified funding.

MAG Long Range Transportation Plan 2001 Update

The LRTP is updated once a year and is based on a 20-year or longer time horizon. The objective of the plan is to identify pertinent trends for regional growth and the associated need for transportation improvements. It includes all modes of transportation. In 2001, it includes a 66% increase in freeway/expressway miles, 45% increase in street lane miles, tripling bus service, quadrupling express and commuter bus service and a 39-mile light rail transit system. The plan is fiscally constrained, based on a trend scenario of currently available revenue sources.

The LRTP will be updated following the completion of the MAG Regional Transportation Plan (RTP), which is scheduled for 2003. The results of this and the other area and background studies

currently in development for the RTP will provide a basis for the new RTP and LRTP.

1998 Regional Congestion Study

The purpose of the Congestion Study was to identify congestion in the regional roadway system. It was largely a data collection (i.e., traffic volumes and speeds) and traffic/volume/density analysis project to measure conditions on the network. This study, in conjunction with a similar analysis done in 1989, begins to shape trends over time and create a central repository of information that can be used to: 1) ensure the MAG travel demand model continues to reasonably reflect current and future conditions on the network, 2) provide input to regional studies and 3) provide a regional context for local traffic studies and design projects. The final presentation developed level of service maps that show conditions throughout the area divided into AM Peak, PM Peak and between freeway and local intersections. The analysis also classified the vehicle mix at 15 locations on the arterials and 27 locations on the freeways to determine what, if any, effect the composition of the traffic has on congestion.

NWATS Impact: In general, with some exceptions, the Northwest Valley in the late 1990s did not experience the same level of congestion as Phoenix or the East Valley. The notable exceptions, as expected are intersections and interchanges along Grand Avenue and I-17. Even I-10 did not show severe loading during PM peak times in 1999 (though the inbound AM peak was at LOS F from 91st Avenue eastward.) Some other locations suffered poor levels of service largely because they are not yet built to their ultimate capacity and are beginning to experience the rapid growth in the area. It is

very likely conditions will look more congested for the next analysis barring a major change in the transportation system.

MAG 1999 External Travel Survey

The external trip survey was designed to keep the MAG Travel Demand Model current and to account for changes in trip characteristics and changes in model area of coverage. For the model to properly reflect the trip making in the region, it must “feed” the appropriate number of external trips to the rest of the system. The last survey had been completed in 1986.

NWATS Impact: For the Northwest Area Transportation Study, there are four external stations (# 4 thru 7.) Among the important findings was that there is a reasonably concentrated flow of trucks through the area along SR 60 and US 93, but that total traffic volumes, for now, are still moderate.

MAG Desert Spaces Plan

“The Desert Spaces Plan identifies and recommends conservation and management strategies for natural resources and open spaces critical to the quality of life in the Valley.”

NWATS Impact: The primary application of this plan to the NWATS is the identification of critical areas worthy of preservation and/or protection to which access should be provided but which should not be used in the development of the transportation system. These can include washes, mountain areas, ridgelines, archeological sites, important vegetation or visual sites, etc. Specified examples in the Northwest Valley are the White Tank Mountains and the Agua Fria, Hassayampa and New Rivers.

Maricopa County White Tank/Grand Avenue Area Plan

This study covers a major portion of the NWATS area though it serves a broader purpose. In general, it seeks to establish the foundation for orderly development into the future so that quality of life is not sacrificed as the area grows. To that end, it promotes goals for land use, transportation, environment, and economic development.

NWATS Impact: The Area Plan identifies issues regarding the transportation system based on the input of stakeholders. The main concerns were to:

- Improve/widen or find alternatives to Grand Avenue
- Improve existing roadways
- Develop a public transit system
- Build railroad overpasses
- Complete Loop 303 (but some believe it should be moved away from Sun City)
- Build a new road to Lake Pleasant
- Build better links across New River
- Provide better east-west connections
- Need more bicycle routes
- Discourage through truck traffic
- Use Grand Avenue RR tracks as a light rail corridor

The plan also proposes goals to help mitigate the problems. The two key goals are to:

1. Improve the roadway network to meet future transportation needs, promote safety, and mitigate congestion.
2. Encourage the use of transit and alternative modes, especially for short trips where these modes are more competitive with the private auto.

Each of these is divided into a series of implementation objectives and policies.

MAG ITS Strategic Plan (2000)

The Strategic Plan was undertaken to define the future structure, planning and programming needs and responsibilities for ITS in Maricopa County following the success of the FHWA Model Deployment Initiative (AzTech). The plan recommends: 1) specific architecture objectives to ensure compatibility among jurisdictions, 2) a telecommunications plan that would move away from leased lines in favor of a WAN for ITS, 3) establishing MAG ITS Committee as the guidance and regional champion and 4) lays out a series of implementation strategies to ensure interjurisdictional coordination and compatibility.

Maricopa County Northwest Area Transportation Study (2000)

This was a comprehensive analysis of all surface transportation modes in the Northwest Valley as far west as the White Tank Mountains. The study produced a five-year capital program, a ten-year implementation plan, and a long-range transportation program (20 years) to support the transportation buildout network already adopted for the area. The study results were not adopted into local plans, but many improvements are identified that provide insight into key areas requiring additional analysis. Projects were identified by each jurisdiction and presented according to priority, implementation timeframe, cost, etc. Some of the same projects continue to be identified by local agencies as issues today. Municipalities that participated in the County study, however, have subsequently requested that MAG develop the Northwest Area Transportation Study (NWATS.) This study may require additional ongoing attention simply because it evaluated many of the same issues identified in the NWATS process.

CITY AND TOWN GENERAL PLANS

Most of the larger communities in the Northwest Valley have a General Plan that specifies a proposed long-range transportation plan. These plans have been summarized to reflect their main points. Most focus on balanced land use and transportation and making provisions for expanding alternative modes as the city grows. They also emphasize specific critical projects or programs within the community.

Town of Buckeye

- The Town shall be responsible for the planning of a sound integrated system of streets, trails and pathways in its Planning Area.
- The Town shall systematically require donation of right-of-way needs for major arterials (including parkways) and collector streets in its Planning Area.
- The Town shall establish priorities for the construction of major roadways and streets and I-10 interchanges within its Planning Area.
- The Town shall coordinate transportation planning and construction with neighboring units of government and transportation agencies.

City of Glendale

Based on public input received and related technical analyses, the following value-based goals were developed to guide the planning process:

- **Ensure Safe Travel:** All elements of the Glendale Transportation system will be built, maintained, and operated in a safe manner.
- **Support Alternative Modes of Travel:** Glendale will provide options to travel by automobile.

- **Maintain Quality Neighborhoods and Environment:** Transportation will not adversely impact neighborhoods or the environment.
- **Provide Fair and Adequate Funding:** Transportation funding will be fair and adequate to meet transportation needs.
- **Strengthen the Economy:** The transportation system will help support a strong economy in Glendale and the region.
- **Assure Quality and Cost Effective Service:** The Glendale transportation system will provide high-quality service in a cost-effective manner.
- **Provide Regional Connectivity:** The Glendale transportation system will be fully and effectively connected to the regional transportation system.
- **Integrate Land Use and Transportation:** Land use patterns and transportation systems will be integrated to help reduce congestion and provide convenient access.
- Integrate Loop 101 and the Lake Pleasant Parkway.
- Develop parks that have good roadway access.
- Improve road facilities before the population increases.
- Don't waste money on an airport. Continue to evaluate the airport feasibility study.
- What plans does Peoria have for increasing transit opportunities such as light-rail?
- Provide the maximum availability of bicycle facilities.
- The trail master plan outlines future trails for the city. These will be incorporated into the General Plan.
- Provide bike lanes throughout the city including Olive Avenue, Northern Avenue, and Peoria Avenue.
- Provide bicycle user facilities and path facilities in residential areas.
- Create a Bicycle Advisory Committee in the City.
- All bike routes need to be signed for alternative routes.

City of Peoria

- Use a "common sense" and balanced approach to planning the transportation network.
- Traffic control and red light enforcement is needed. A speed zone test is needed to determine the severity of speeding in specific areas.
- Truck traffic is a problem on Pinnacle Peak Road, Beardsley Road, and Northern and Olive between 91st Avenue and 115th Avenue.
- Traffic flow east and west is problematic.
- Bell Road is a very bad road.
- Semi-truck trailers (18-wheelers) need to stay off Monroe Road in front of City Hall.

City of Phoenix

The Circulation element of the General Plan discusses how to reduce the rate of increased traffic congestion, which is increasing faster than population growth. According to the General Plan, Phoenix needs to promote more alternatives to driving alone and to decrease the number and length of trips.

- **Expanded Street Transportation System:** Increase capacity of major streets and freeways and promote safety for drivers and pedestrians.

- Neighborhood Protection: Protect neighborhood local and collector streets from high-speed and cut-through traffic.
- Mass Transit: Expand bus service, construct high occupancy vehicle lanes and build light rail transit to link village cores, employment centers and major destinations in high demand corridors.
- Airport Expansion: Expand airport capacity and shift some service to reliever airports.
- Pedestrian and Bicycle Environment: Expand pedestrian and bicycle access to transit facilities by adding paths and trails, shade trees, lighting and grade separated crossings.

City of Surprise

The objective of the Transportation/Circulation element of the General Plan is to ensure that residents and visitors have a safe, efficient, effective, and convenient multi-modal transportation system. The system provides internal efficient travel connections while providing access regionally. The Transportation/Circulation element strives to complete the grid system. It is a priority to restrict developers from inhibiting construction of arterial roadways along section lines.

The specific recommendations include:

- Embrace promising transportation and information technologies.
- Work toward a “seamless” and coordinated transportation system.
- Encourage the use of transit and alternative modes of transportation by promoting development patterns that reduce the need for automobiles.
- Identify a connected bicycle network that extends and complements all bicycle plans and systems into and throughout the City of Surprise.

- Encourage convenient and safe pedestrian facilities.
- Improve gold cart access and safety in the City of Surprise planning area.
- Develop city “Transportation Design Guidelines” for the City of Surprise

Town of Wickenburg

The Transportation element of the General Plan identifies the general location and extent of existing and proposed major arterials, collector streets and street classifications. It considers multi-modal transportation options including transit, pedestrian and bicycle alternatives. The General Plan recommends the following for transportation planning considerations:

- Coordination, with ADOT, for implementation of the proposed, interim by-pass is necessary to alleviate traffic congestion (particularly trucks) in the Town center. Longer-term by-pass planning should route traffic around the community for connection with the CANAMEX Highway and realization of economic development Growth Areas opportunities.
- Internal circulation improvements may be coordinated through Capital Improvement Program and Master Street Plan prioritization. Arterial and collector streets are expected to provide a uniform and continuous roadway system, with particular attention to railroad grade crossings (e.g., Town Core, Vulture Mine Road) and street patterns in the southwestern portion of the community.
- A comprehensive pathway network, building on existing pedestrian linkages, is advocated for residents’ in-Town trips and tourist attractions. Multiple alternate modes of travel are promoted – walking

and bicycling; trails for horseback riding, mountain biking and hiking.

- Wickenburg Airport enhancements should also evaluate the potential use of Town-owned facilities at Forepaugh to accommodate regional aviation demands.

HIGHWAYS

MAG Grand Avenue Corridor Study (Beardsley Canal to 7th Avenue)

This study covers 14 separate options for how to address the major challenges associated with the Grand Avenue Corridor including how to integrate transit and mitigate the impacts of development. The study concluded that there was significant interest in major improvements, but that there was no clear consensus regarding what they should be. The choices were narrowed to three: alternating grade separations, limited expressway, and full expressway.

MAG Grand Avenue Major Investment Study

Following the Corridor Study, the MIS limited the analysis to two options, alternating grade separations and limited expressway, between the shortened project limits of I-17 and Loop 101. The full expressway was dropped because of high cost and a lack of local support. The MIS recommendation was to build the alternating grade separations at six-legged intersections at a total cost estimated at \$180 million, to be implemented by 2007. The NWATS findings will take account of the results of this study as part of the baseline condition to be modeled in the testing of long-range options for the overall Northwest Valley transportation system.

US 60-US 93 Wickenburg Realignment – Corridor Location Report

The objective of the study was to identify corridors that would take traffic around downtown Wickenburg but not undermine the community's vitality. A total of 34 alignments were evaluated resulting in the recommendation for further study of an East Corridor that would maintain a visual connection to Downtown Wickenburg and a West Corridor that would push the roadway outside the developed area. Both options avoid environmental impacts to many sensitive features in the area. The final decision has not yet been made about how the new route will be funded or when.

Roads of Regional Significance

The concept behind the Roads of Regional Significance (RRS) was to develop an arterial backbone that could help to improve mobility throughout the Valley. By establishing a network of roadways built to a high standard that could both move traffic and offer opportunities for other modes, the region could take some of the pressure off a limited freeway system. The RRS covered 542 miles of roads with emphasis on the key arterials in each community with specific guidelines designed to "homogenize" interjurisdictional travel and afford options to alternative modes. The cost of the system was estimated at \$2 billion. The report identified various options to fund the improvements of the system,

NWATS Impacts: The RRS includes the key roadways in the Northwest Valley and forms the basis and solution of many of the issues to be addressed in NWATS. System continuity, river crossings, superstreets, etc. may all best be addressed in the context of the intent of RRS as priority corridors for the future transportation system.

West Area Transportation Study (1985)

This study recommended a freeway or consideration of grade-separated intersections along Grand Avenue.

Central Area Transportation Study (1985)

Recommended a variety of highway improvements including the Paradise Parkway as a solution to the Grand Avenue problem in the Northwest Valley.

East-West Mobility Study (Underway)

The study is to develop strategies for roadway improvements that address east/west mobility in an area between (and including) Thunderbird/Waddell Road and Northern Avenue, extending from Loop 303 to SR-51. East/west mobility in this part of the metropolitan region is a continuing concern, in view of growing travel demand and the spacing of regional facilities serving the area. Cost effective strategies that improve east/west traffic flow are needed to help mitigate significant constraints on east/west mobility in the future. The overall goal of the study is to recommend concepts for improving east/west mobility by enhancing traffic flow and the capacity of the road network in the study area. The study recommendation will identify feasible improvement project concepts, costs and evaluate cost effectiveness. It is anticipated that options considered would include: signing improvements, directional bias/ reversible lanes, signal synchronization/coordination, ITS, removal of access, medians/turn restrictions, intersection improvements, gap closures, street extensions/ widenings, installation of bus bays, and grade separations.

NWATS Impacts: A major portion of the East-West Mobility Study is located in the Northwest Valley and its results will need to

be coordinated in the alternatives to be developed for NWATS.

MAG Freeway Bottleneck Study (Underway)

The purpose of the Freeway Bottleneck Study is to identify and analyze bottlenecks, and to evaluate freeway Level of Service (LOS) and rank projects to improve these bottlenecks. In this study, freeway traffic data will be collected on the existing freeway system throughout the Valley. These data will include traffic density, queue, and volumes, etc. It will then be determined where bottlenecks are, how to improve them, the cost to improve them, etc. Future traffic on the freeways will be forecasted. Future bottlenecks will be identified, operational and other benefits of the freeway improvement projects will be calculated, and freeway improvement projects will be ranked based on the above analysis. In addition, the traffic data collected will be used by MAG member jurisdictions and private organizations for various other traffic studies.

During discussions on the bottleneck study with the MAG Management Committee structure, three major other study needs were identified. The three tasks are:

- Expand the crash data to include the entire freeway system and to include a more detailed evaluation of freeway crashes.
- Develop an interchange spacing policy for the urban area to provide guidance on the construction of additional traffic interchanges on the freeway system.
- Identify and evaluate future freeway configurations necessary to carry traffic at an acceptable Level of Service through the year 2040.

NWATS Impacts: The findings of the Bottleneck Study will determine where in the

Northwest area freeways additional investment will be required to improve freeway operation or reduce safety concerns.

TRANSIT

Peoria Transit Plan

The City of Peoria undertook the development of the Transit Plan as a guide for transit investments and transportation decision-making over the next twenty years. Its focus is for a commitment to dial-a-ride in the next few years with a gradual shift to higher capacity service on extensions of key routes in the area. It is designed to be compatible with the overall vision, goals, policies and objectives established in the City's General Plan in the areas of Circulation, Conservation, Land Use/Growth Areas, economic development and Public Services. It focuses on a 2020 horizon year and offers guidance for investment in transit programs through 2020.

NWATS Impacts: The City of Peoria is one of the largest in the Northwest Valley and is a major player on the evolution of a future regional transit system. Peoria is critical to eventual extensions of fixed route and light rail service to the west.

Surprise Transit Plan

Surprise is the fastest growing community in the Valley of the Sun. It has many ambitious plans for the future and is interested in making transit a part of the future transportation program. In particular, the Transit Plan calls for an expansion of dial-a-ride service in the short term and a broadening of the City's participation in regional transit programs. In general, because of limited resources with which to fund transit improvements, Surprise will likely opt to wait for a source of regional funds to expand services to any significant degree. In the short term, the City is working

with RPTA and its neighbors to offer better dial-a-ride programs that take riders where they really want to go. With some assistance from the neighbors, Surprise would like to begin a short loop system that connects the important destinations for community residents as a means to begin to grow the program.

NWATS Impacts: As with Peoria, Surprise is a geographically large city with some significant influence over how the transportation system evolves. The transit plan will help to guide the NWATS transit plan development recognizing the gradual nature of a shift from highway emphasis to a more balanced plan.

MAG Park-and-Ride Study

The objective of this study was to identify possible park-and-ride lots that would support the use of expanded express bus services and take advantage of the growing network of HOV facilities in the region's freeway system. Based on a series of criteria for target geographic areas and possible sites, the project identified ten sites for short-term development and ten sites for longer-term development where rights-of-way could be preserved. The recommendations included a management and operations plan for the system and priority programming and implementation strategies. The project report and recommendations were approved by the MAG Regional Council in January 2001, and were incorporated into the 2001 update of the MAG LRTP.

NWATS Impacts: There are eight sites in the recommended plan within the Northwest Area. Four are in the near-term plan and four in the long-term plan. These will be instrumental in establishing or strengthening express bus service in the short-term, but also very important in the long term as fixed route and possibly light rail service grows to the west.

High Capacity Transit Plan

The MAG High Capacity Transit Plan will:

- 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.

NWATS Impacts: The high capacity plan will assess opportunities for high capacity transit in many corridors through the Northwest Valley. The results of the study will need to be coordinated with NWATS.

BICYCLE/PEDESTRIAN

Maricopa County Bicycle System Plan

The 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.

NWATS Impacts: Many of the facilities identified are in the Northwest Valley and will need to be included in any recommendations for a long-term transportation plan. Future plans will need to address the location of the identified bicycle routes as some may conflict with other designated regional facilities (e.g., CANAMEX) and not prove compatible with bicycling. This may force a reconsideration of the design of the bicycle or highway system.

MAG Pedestrian Plan 2000

This is an update to the 1993 MAG Pedestrian Plan. The 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.

This plan specifically focuses on pedestrian access and facilities. Roadway Performance Design Guidelines that specifically emphasize on improving pedestrian facilities with new road construction, and retrofitting existing facilities with landscape buffers, and meandering walkways to improve the pedestrian experience and encourage pedestrian activity.

NWATS Impacts: The Pedestrian Plan calls for the design guidelines to be incorporated into the MCDOT roadway design standards. This means that new roadway construction should defer to these specific guidelines to provide and improve pedestrian facilities.

West Valley Rivers Master Plan

This project is a flood control effort to develop non-structural solutions to potential flooding in the West Valley along the New River and the Lower Agua Fria River. As part of the project, there is a plan to take advantage of the floodplain management work to integrate open space and recreational uses. As proposed, the master plan includes 42 miles of non-motorized urban and rural trails for pedestrians, hikers, bicyclists and equestrians.

NWATS Impacts: the West Valley Rivers Master Plan directly affects Glendale, Peoria and Phoenix. A major element of their non-motorized transportation system will be invested in this program.

GOODS MOVEMENT

ADOT ITS-CVO Business Plan

The objectives of this business plan was to provide a framework for identifying problems within the current Commercial Vehicle Operations (CVO) and the opportunities for applying Intelligent Transportation Systems (ITS) to address these problems. Another objective was to develop a policy and consensus with state and local agencies and the motor carrier industry on the development and deployment of ITS and CVO. The business plan's ultimate goal is to improve and streamline mobility for motorists and the motor carrier industry.

Regional Context: The ITS/CVO business plan includes the Freeway Management System (FMS). The FMS is operated and controlled by ADOT Traffic Operations Center. The Traffic Operations Center operates the variable message signs along the Interstates in the Northwest Valley. Upon completion of the 265-mile Phoenix freeway system, the FMS will include monitoring via closed-circuit television (CCTV) that will include intersection signaling, mainline detection and ramp metering. Through the implementation and use of the FMS, motorists and motor carriers will be made aware of incidents and roadway conditions that could cause potential delays and in turn make accommodations in their travel patterns to avoid the incident areas and maintain mobility through the region.

The business plan also examines the issues involving CVO in Arizona. Most truck related trips are within identified "trucksheds" or areas where origins and destinations are usually regional or local. Enabling the streamlining of regulation in the CVO industry where 1 in 12 jobs in Arizona and nearly 70% in Arizona of all commodities are delivered was identified as essential. The plan outlined the inspection

and weighing policies of motor carrier vehicles and ways to eliminate the congestion that these activities can cause.

NWATS Impacts: Since the potential alignment of the CANAMEX priority corridor may bisect the Northwest Valley, the application and coordination of the ITS /CVO business plan could have mobility implications for the study area.

MAG Intermodal Management System

This plan was part of federal requirements to prepare a regional intermodal management system plan. It was an effort to simplify the interaction among modes and to help integrate transportation facilities and systems. The goals of the plan are to enhance the capability of transportation facilities, whether publicly or privately owned, to interact with each other in the most efficient cost-effective and least environmentally harmful manner. In order to accomplish this, the intermodal system was defined as enhancing the connectivity between modes as well as increasing the coordination of transportation decisions among modes.

NWATS Impacts: The IMS regional context and how it applies to the NW Valley Study Area is identified in the plan's goals and recommendations. Those recommendations were identified as the following recommended goals:

- 1) Provide convenient and rapid transfers between modes.
 - a. Establish the provision of seamless connections between transportation modes by making it easier to connect from one mode of service to another.
 - b. Establish transit schedules to reduce waiting time especially at transfer centers.

- 2) Provide better access to intermodal transfer points.
 - a. Extend existing or provide new public transit routes.
 - b. Build or designate bike lanes and provide bike lockers.
 - c. Build or extend existing sidewalks.

CANAMEX Corridor

Following the adoption of the North American Free Trade Agreement, discussion centered around how to provide expedited access for trucks from Mexico to Canada. ADOT and MAG were part of the designation of a preferred route that would take international truck traffic through or around the Valley of the

Sun. Starting with eight alternative routes connecting the I-10/I-8 interchange near Casa Grande and the SR 93/Vulture Mine Road intersection near Wickenburg, the various options were filtered through a set of ten evaluation criteria to provide the basis for selection of a preferred route.

NWATS Impacts: Following the study, a determination was made to select Wickenburg Road and Vulture Mine Road as the preferred route choice through the Northwest Valley. This decision will have implications for future truck traffic in the entire Northwest area and for general traffic in developing areas of Buckeye and Wickenburg.

Appendix 2: Consultation Documentation

AGENCY STAKEHOLDER WORKSHOP MINUTES

July 1, 2002 - Glendale Public Library

Attendees

MAG Member Agencies

Blanton	Joe	Town of Buckeye
Grover	Allan	City of Glendale
Tranberg	Dana	City of Glendale
O'Hare	Jon	Maricopa County Department of Transportation
Moody	David	City of Peoria
Nodes	Scott	City of Peoria
Herp	Don	City of Phoenix
Stephenson	Alan	City of Phoenix
Perl	Ellis	City of Surprise
Fooks	Mark	Town of Youngtown
Boggs	Stuart	Regional Public Transportation Authority
Eaton	Chuck	Arizona Department of Transportation

Other Stakeholders

Perica	Carol	Gabel Investments
Ring	Bill	LKY Development
Hubbs	Carole	PORA Planning & Zoning
Patten	Jerry	Rowland Co.
Kanig	Jeffrey A.	Sun City Grand Community Association

MAG Staff

Voigt	Chris	MAG
Tomasik	Jack	MAG

Consultant Team

Bresnahan	Jorie	Parsons Brinckerhoff
Gruver	Terry	Parsons Brinckerhoff
Hogan	Steve	Parsons Brinckerhoff
Snyder	Gregg	Parsons Brinckerhoff

Consultant Coordination

Matsen	Martin	Wilbur Smith Associates (SW Study)
Meronek	Linda	Wilbur Smith Associates (SW Study)

ITEMS DISCUSSED

Eighteen representatives attended the forum from cities and the general public. Following introductory remarks by the City of Glendale, the consultant team presented an update of the first phase of the project. Following on the presentation, the stakeholders divided into three separate groups to develop suggestions for transportation investments for the area.

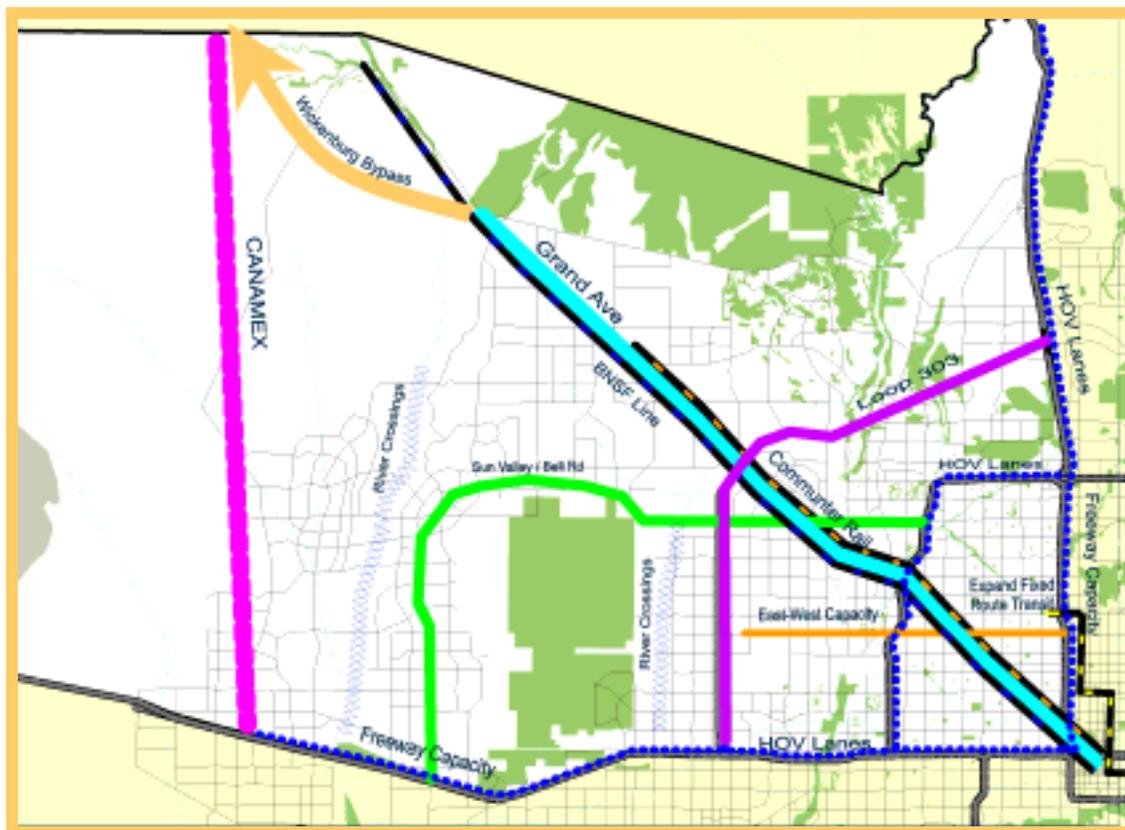
PRESENTATION (SEE COPY ON THE MAG WEBSITE, WWW.MAG.MARICOPA.GOV)

Steve Hogan provided an overview of the patterns of growth projected in population and employment for the Northwest Valley and the effect they are likely to have on the future transportation system. The trend in growth is clearly away from the developed areas along the major highway corridors (I-10, I-17 and Grand Avenue). The changes over the next 20 to 40 years show growth likely to outstrip roadway capacity even with the substantial improvements already planned.

TRANSPORTATION ISSUES IDENTIFIED TO DATE (FIGURE 1)

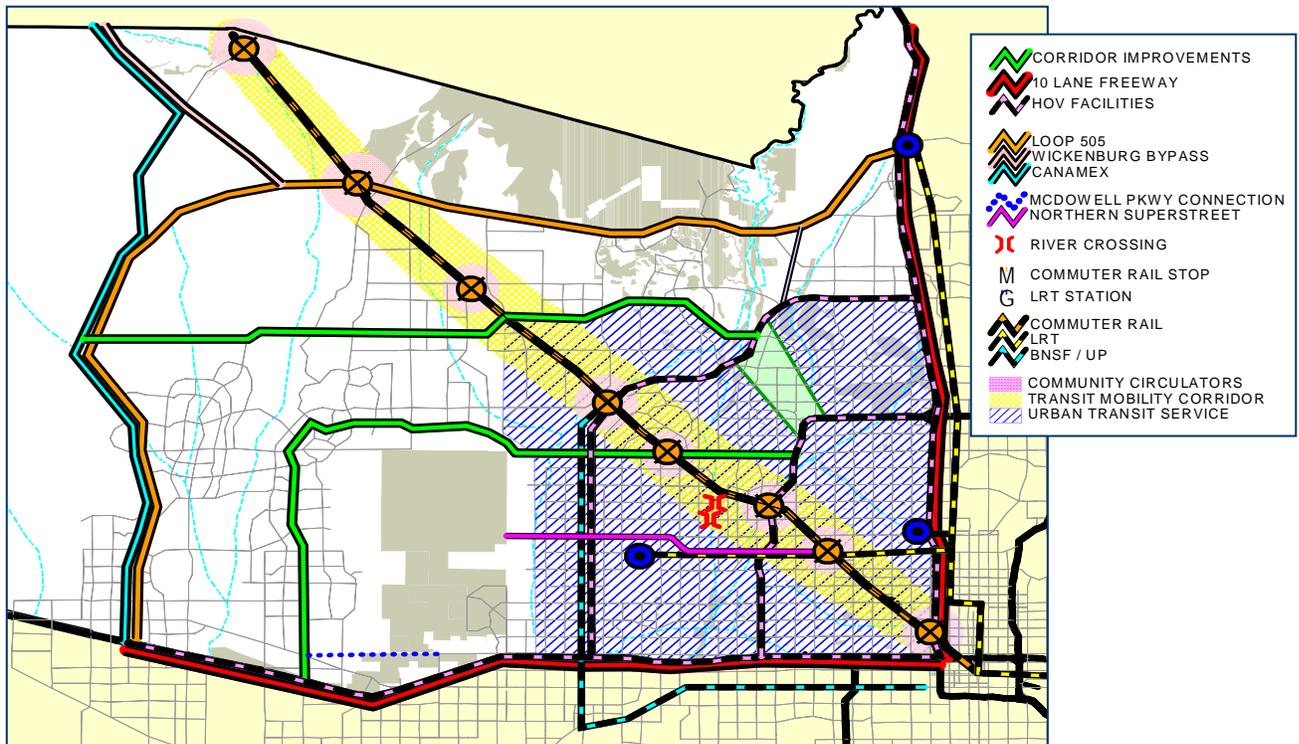
The consultant identified preliminary issues, considering input received in discussions with each of the jurisdictions and various other interests. The need for additional highway capacity and high-level facilities, such as freeways, was identified as a key issue. A map reflecting the most significant issues was presented to the stakeholders as a basis for group discussion and development of suggestions for future transportation improvements.

Figure 1 - ISSUES



The consultant presented draft solutions to the identified issues (see Figure 2). The draft emphasized not only potential highway improvements, but also potential transit development to enhance the capacity and accessibility of prescribed corridors. These potential new facilities are not funded. They are intended as illustrative examples only. Funding recommendations will be made in the RTP following the completion of the area studies.

Figure 2 – SAMPLE MAP

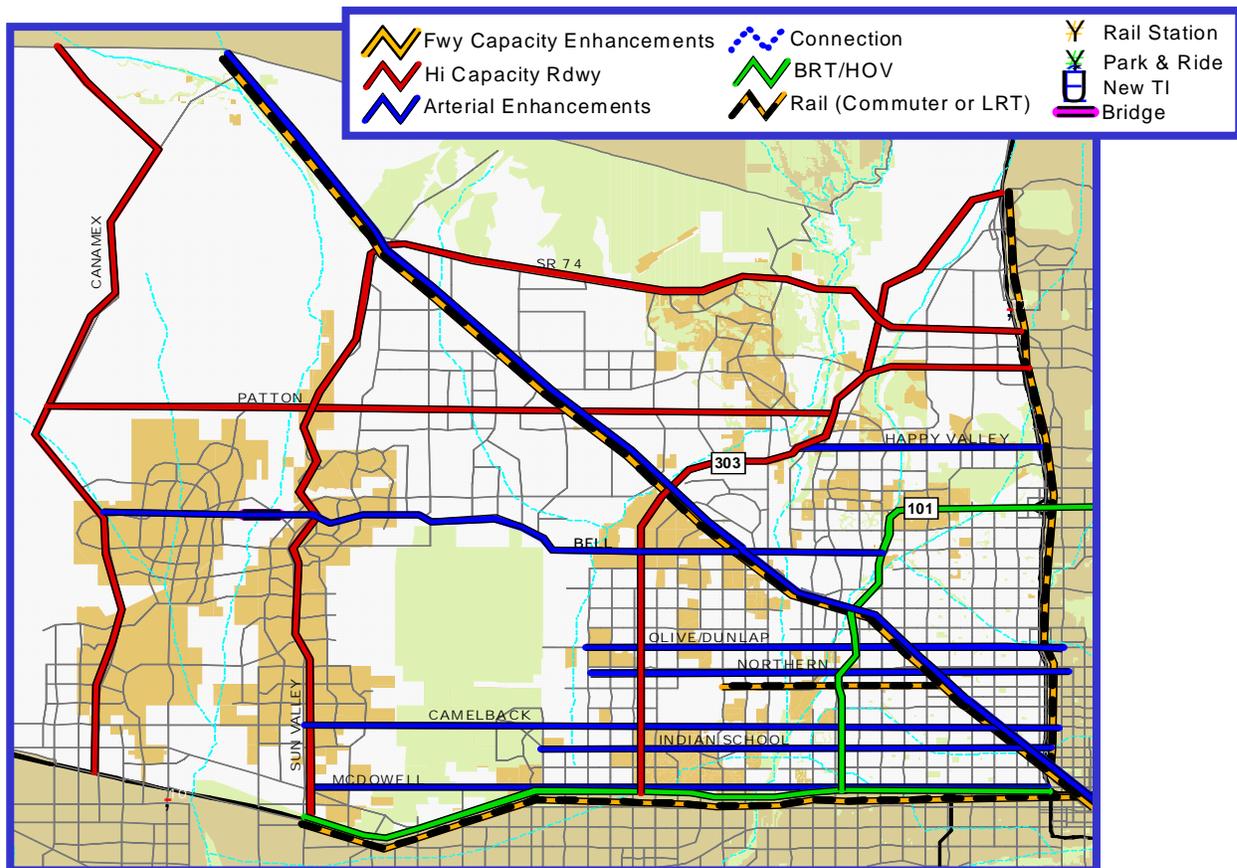


STAKEHOLDERS' SUGGESTIONS

Each of the three stakeholder groups worked to prepare and present suggestions for new transportation investments.

GROUP A

Figure 3 – SUGGESTIONS BY GROUP A



HIGHWAY COMPONENT

This group identified needs for a number of arterial and major roadway improvements to help improve the arterial grid and better manage traffic demands. They specified the following extensions and enhancements:

Arterials

- McDowell Road (Sun Valley Parkway to Phoenix)
- Camelback Road (Sun Valley Parkway to Phoenix, through the White Tank Mountains),
- Indian School Road (White Tank Park to Phoenix)
- Northern Avenue (Perryville Road to Phoenix)
- Dunlap Ave/Olive Road (Perryville to Phoenix)
- Bell Road (CANAMEX to I-17)
- Happy Valley Road (Loop 303 to I-17)

High Capacity Roadways

- Patton Road
- CANAMEX Corridor (Wickenburg Road and Vulture Mine Road),

- Sun Valley Parkway,
- Carefree Highway (SR 74),
- Grand Avenue, and
- A connection between New River Road and the Loop 303 Corridor
- This alternative assume completion of Loop 303 from I-10 to I-17 at Lone Mountain Road

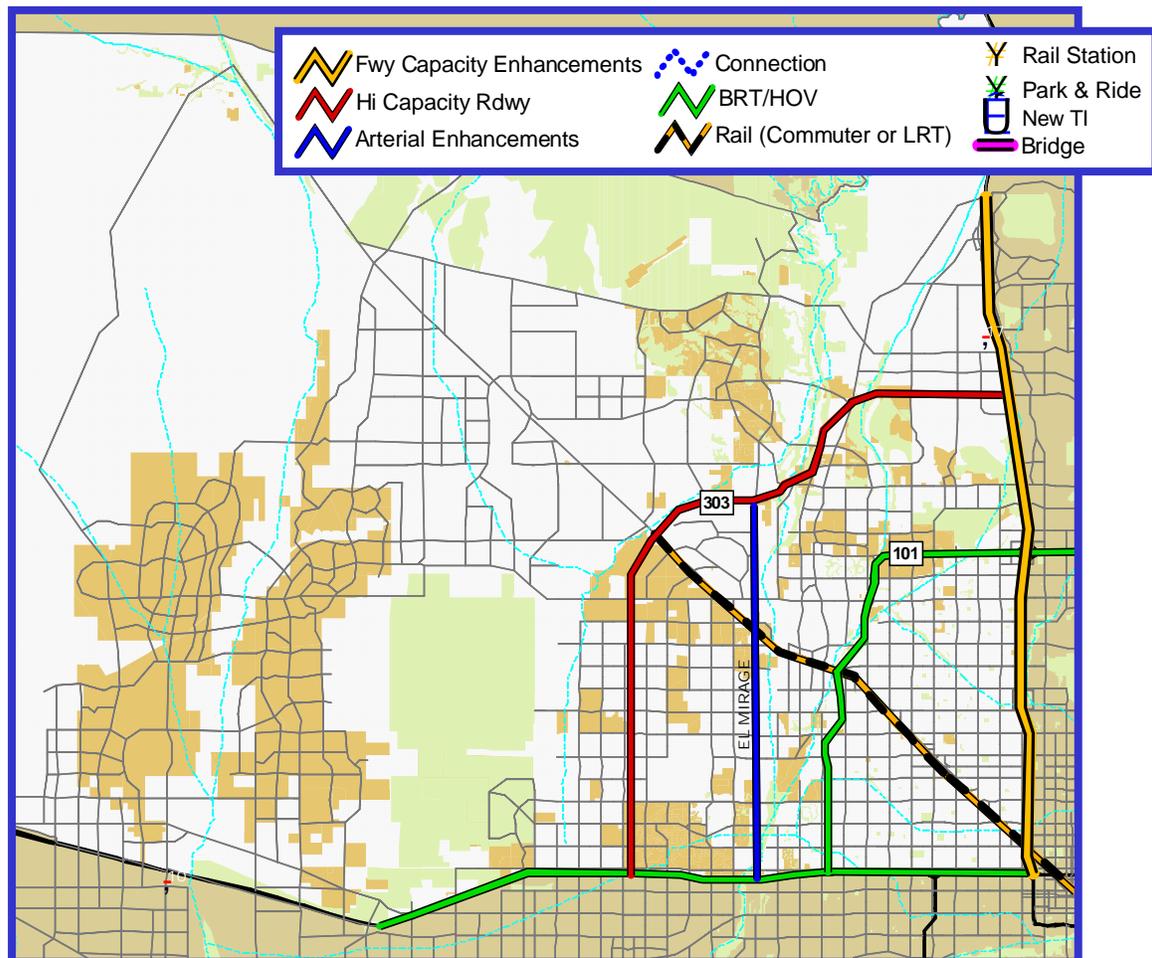
TRANSIT COMPONENT

In addition to expanded bus service, ambitious investment in transit improvements, including rail and other high capacity modes, was suggested:

- BRT/HOV lanes were proposed for I-10 and Loop 101
- Commuter rail from Phoenix to Wickenburg
- Commuter rail from Buckeye to Phoenix along I-10
- Light rail was suggested Glendale Ave from CP/EV to Luke AFB
- LRT along the I-17 corridor into North Phoenix

GROUP B

Figure 4 – SUGGESTIONS BY GROUP B



This group emphasized congestion mitigation through policy support and by expanding high capacity facilities within the already built up or building portion of the study area, primarily southeast of Loop 303. This option also focused on transit amenities in addition to the location of major transit service (e.g., identifying park and ride lots to help support transit service.)

HIGHWAY COMPONENT

- Complete Loop 303 as a parkway with limited truck allowances
- Create a major north-south arterial corridor along El Mirage Road (I-10 to Loop 303)
- Expand I-17 from Phoenix to New River
- Add four new interchanges along I-17, including Happy Valley Road
- Recognize need to build out arterial grid where possible
- Identify more east-west connections (although Youngtown prefers Peoria Avenue not extend across Agua Fria River)
- Identify more north-south connections
- Plan traffic signal locations to minimize impact on roadway carrying capacity

TRANSIT COMPONENT

- Add BRT/HOV lanes on I-10 (existing to Sun Valley Parkway)
- Add BRT/HOV lanes to Loop 101 (entire length)
- Implement commuter or light rail along Grand Avenue (Phoenix to Surprise)
- Build park and ride lots at Grand/Loop 303
- Expand fixed route service
- Expand dial-a-ride service

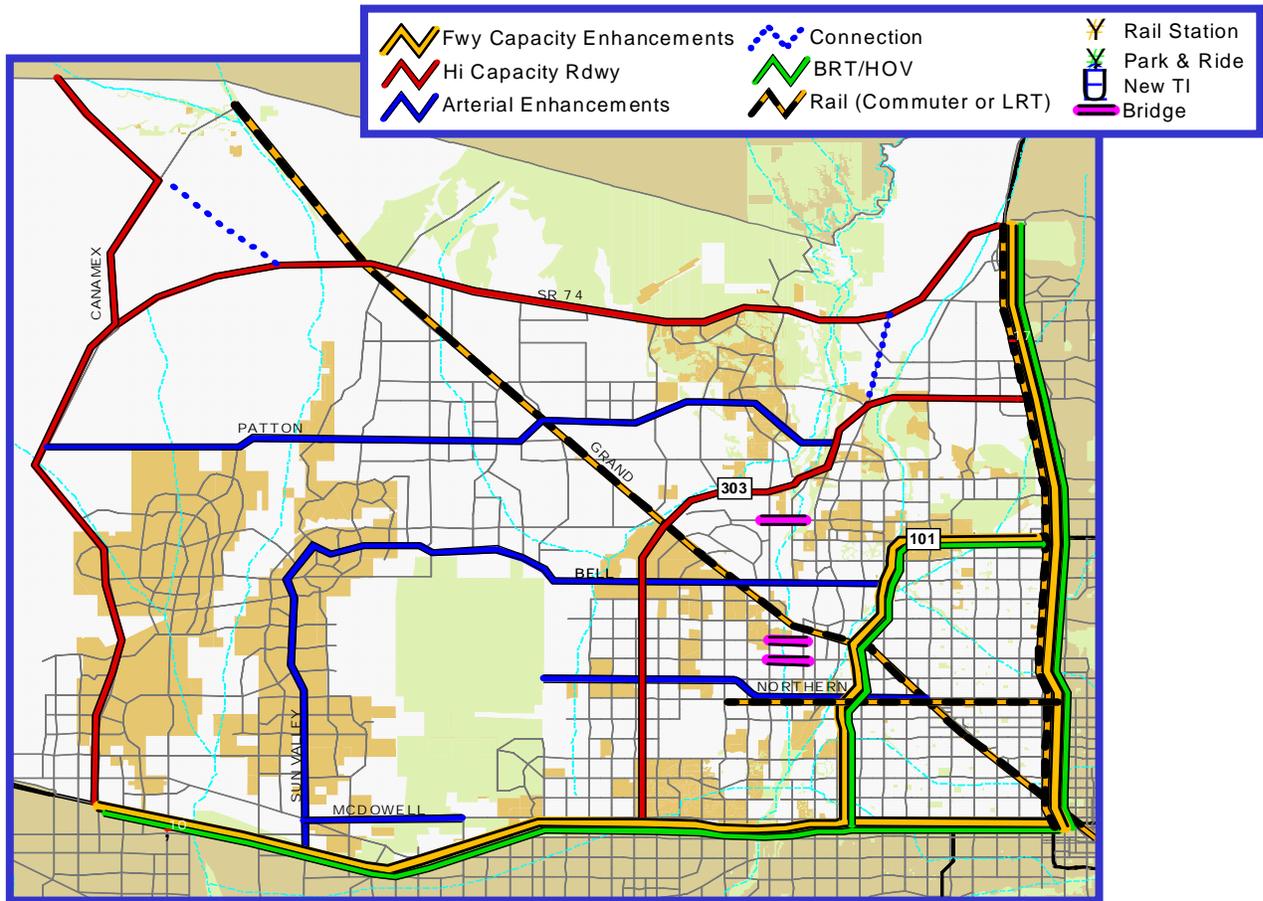
POLICY COMPONENT

- Implement signal coordination throughout the area (and region)
- Limit trucks to appropriate roadways only
- Concern about loss of signals in Youngtown

GROUP C

This alternative is essentially the same as the Sample Map presented by the Consultant. The group added a statement about the need for a regional source of transit funding as opposed to the city-by-city approach now in effect.

Figure 5 – SUGGESTIONS BY GROUP C (Alternative 4)



December 9, 2002 - Peoria City Hall

ATTENDEES

MAG Member Agencies

Bushfield	Bob	City of El Mirage
Gunyuz	Jamie	City of El Mirage
Grover	Allan	City of Glendale
Johnson	Terry	City of Glendale
Tranberg	Dana	City of Glendale
Moody	David	City of Peoria
Nodes	Scott	City of Peoria
Roberts	Randy	City of Peoria
Fitzhugh	Charles	City of Phoenix
Herp	Don	City of Phoenix
Gutier	Miryam	City of Surprise
Phillips	Scott	City of Surprise
Pirooz	Brian	City of Surprise
O'Hare	Jon	Maricopa County Department of Transportation
Boggs	Stuart	Regional Public Transportation Authority
Blanton	Joe	Town of Buckeye

Other Stakeholders

Smith	Andy	Arizona Department of Transportation
Anderson	Clyde	Arizona State Land Department
Dugan	John	BNSF Railroad/Pharos Corp.
West	Rick	Carefree Partners
Butteweg	Robert	CMX
Perica	Carol	Gabel Investments
Patten	Jerry	Rowland Co.
Targowski	Cliff	Sunbelt Holdings

MAG Staff

Voigt	Chris	MAG
Coomer	Dawn	MAG

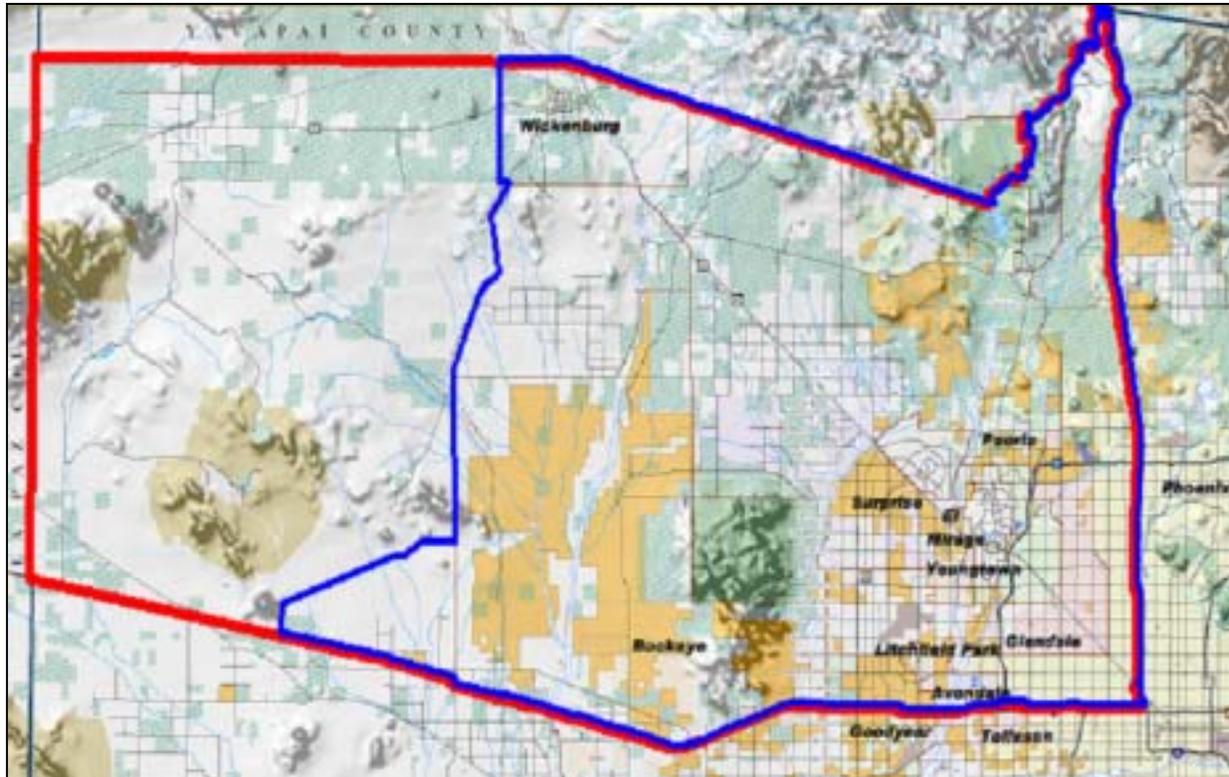
Consultant Team

Bresnahan	Jorie	Parsons Brinckerhoff
Gruver	Terry	Parsons Brinckerhoff
Hogan	Steve	Parsons Brinckerhoff

ITEMS DISCUSSED

Twenty-four representatives attended the forum from cities and the general public. Steve Hogan began the meeting with introductions and a review of the study area (Figure 1). Copies of updated alternatives maps were noted as available at the table in the back of the room. The large boards placed around the room presented the same maps.

Figure 1: Study Area



Stuart Boggs of the Regional Public Transportation Authority (RPTA) provided an overview of the Regional Transit System Study. After this presentation, Dawn Coomer of MAG provided an overview of the High Capacity Transit Study. Steve Hogan then presented three transportation system alternative packages to be modeled, along with the MAG 2002 Base Network map (Figure 2) for reference.

The three transportation system alternative packages presented were:

1. MAG Long Range Transportation Plan (LRTP)-Based Reference Network (Figure 3);
2. Enhanced and New Highways (Figure 4); and
3. Commuter Arterial Routes (CARs) (Figure 5).

Figure 2: MAG 2002 Base Network

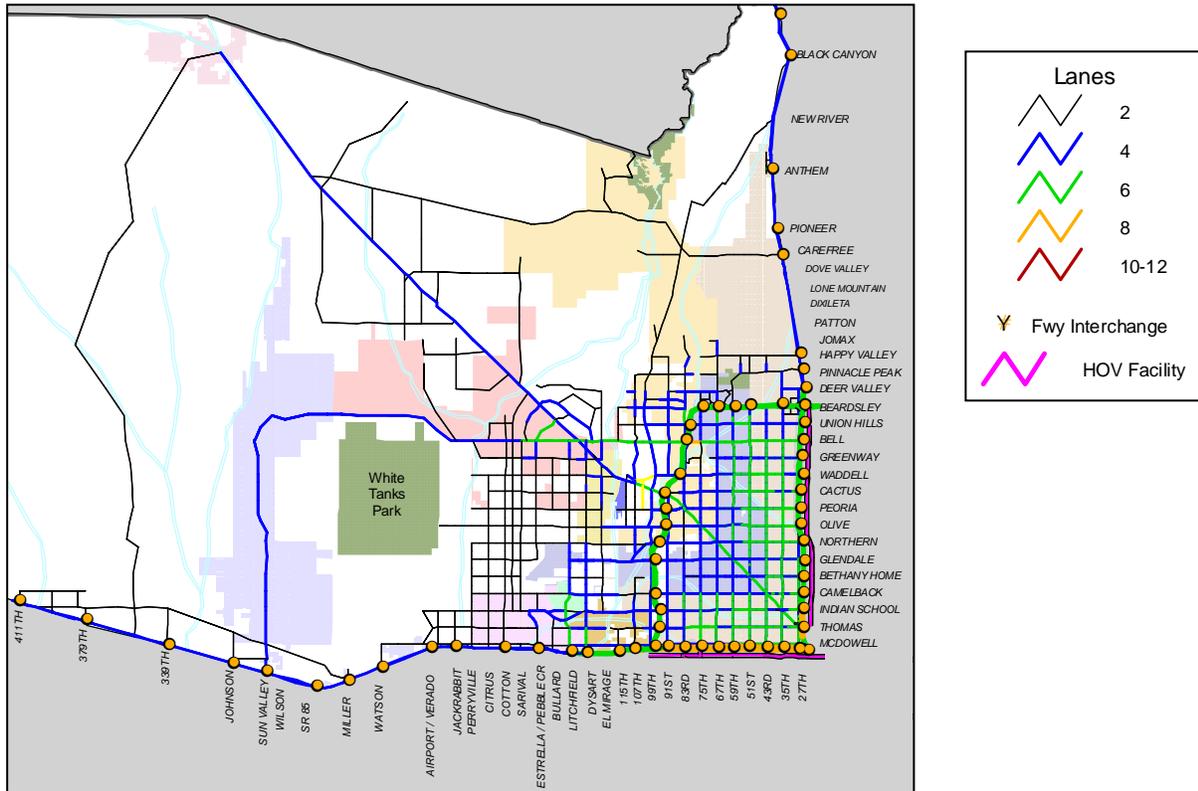
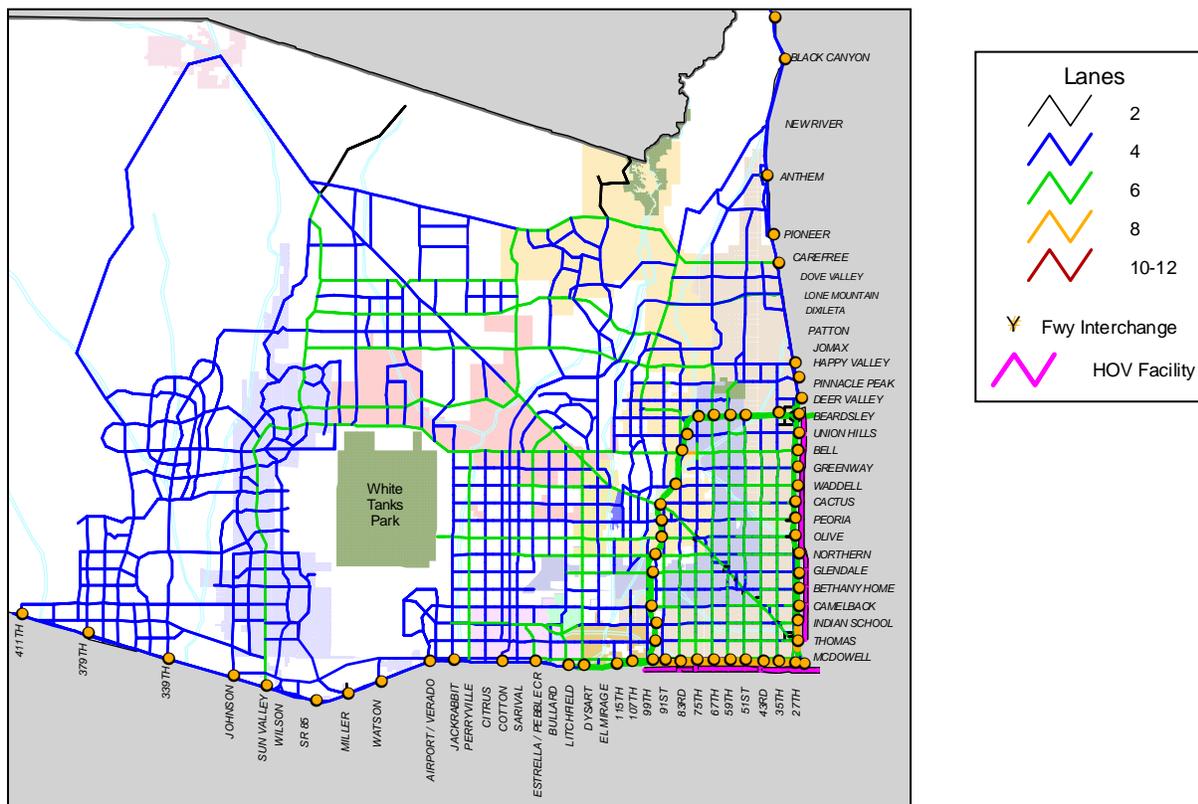


Figure 3: LRTP-Based Network



Copies of each of the slide presentations given at this meeting are available on the MAG website, (www.mag.maricopa.gov).

Attendees were asked to comment on the alternative packages maps no later than Monday, December 16, 2002. Comments during the meeting on the alternative packages maps included:

- Rick West from Carefree Partners asked about rail and transit service along Loops 303 and 101, and about the Loop 303 connection to I-17. Coordination with the ADOT DCR that is currently underway for the connection to I-17 was noted. He also indicated that he would provide comments on the socioeconomic data later.
- Buckeye would like to see the alignment of the northern portion of the Sun Valley Parkway moved further east.
- Glendale stated that Northern Avenue should be identified as some type of highway on the Enhanced and New Highways map. They indicated that it had already been modeled (for a Glendale study) so the coding for the model was already done. In addition, they would like the southern portion of Grand Avenue (from Northern Avenue to I-17) to be coded as a limited access expressway. They also noted that this coding should be discussed with the other local jurisdictions (Surprise, Peoria, El Mirage, Youngtown, Phoenix, and the County unincorporated areas)
- Glendale stated that direct HOV access should be shown at the Maryland Overpass and that HOV connections be shown at Loop 101 & I-17, and Loop 101 and I-10.
- Glendale asked if there would be a funding plan for the proposed facilities. Funding was noted as to be addressed in the RTP process and not the area studies specifically.
- BNSF believes potential commuter rail from downtown Phoenix to Wickenburg along the BNSF right-of-way should be shown in the Commuter Arterial Routes package map.
- El Mirage indicated that they prefer the proposed CARs route along El Mirage Road be south of Grand Avenue a straight connection of El Mirage from I-10 to Carefree Highway, including the central portion through the Town of El Mirage. They indicated that this alignment would bring positive economic benefits to the Town.
- El Mirage noted that both Happy Valley Road and Patton Road are identified for improvement on the Enhanced and New Highways package map, but that only Happy Valley Road is shown on the CARs package map. They questioned if both Patton and Happy Valley Roads should be shown on the CARs map.

NEXT STEPS

Comments on the draft materials presented today were requested by Monday, December 16, 2002. The next Forum will be to review evaluation results for the modeling packages and preliminary modeling recommendations.

February 19, 2003 - Glendale Civic Center

ATTENDEES

MAG Member Agencies

Dille	Shane	Town of Wickenburg
Grover	Allan	City of Glendale
Johnson	Terry	City of Glendale
Moody	David	City of Peoria
Herp	Don	City of Phoenix
Truitt	Lyn	City of Surprise
Boggs	Stuart	Regional Public Transportation Authority

Other Stakeholders

Eaton	Chuck	Arizona Department of Transportation
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MAG Staff

Voigt	Chris	MAG
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Consultant Team

Bresnahan	Jorie	Parsons Brinckerhoff
Gruver	Terry	Parsons Brinckerhoff
Hogan	Steve	Parsons Brinckerhoff

ITEMS DISCUSSED

Steve Hogan began the meeting with introductions then began a PowerPoint presentation (copies of the slides are attached). He gave an overview of the project objectives and reviewed the study area and then presented maps and cost tables (see attachment) for five transportation networks:

1. 2002 Network: essentially the current conditions.
2. Future Base Network: adds new arterial and freeway miles, and widens certain existing roadways and freeways.
3. Enhanced Highways Network: provides improvements to I-10, I-17, Loop 101, Grand Avenue, Northern Avenue, and specific rural highways.
4. New Highways Network: provides improvements or adds facilities at:
 - Loop 303
 - New River Extension
 - 59th Avenue
 - Carefree Highway
 - Loops 101/303 Connector
 - Wickenburg Bypass
 - New Interchanges (I-10 and I-17)

5. Option A New Highways Network: provides for all the improvements listed in the New Highways Network, plus additional lanes on I-17 between I-10 and Loop 101.

Steve discussed the highway operation comparisons of the various networks and provided a recap of potential transit improvements for the NWATS area, as identified in MAG's High Capacity Corridor Study and the Regional Public Transportation Authority's Regional Transit System Study. He described existing bikeways and potential off-road bicycle corridors.

After presenting potential transportation improvements, Steve discussed draft NWATS priorities, based on the following criteria:

- | | | |
|-------------------------------|------------------------------|--------------------------|
| • Facility Utilization | • Cost efficiency of project | • Physical/environmental |
| • VMT | • Adjacent Facilities | • Activity centers |
| • Traffic range | • More regional | • Relocations |
| • LOS | thoroughfare | • Local |
| • Facility/Service Costs | • Congestion relief | • Modal options |
| • Capital costs | • Connectivity | |
| • Operating/maintenance costs | • Safety | |
| | • Community Factors | |

Draft freeway priorities were described as follows:

First Priority

- I-10, including HOV improvements

Second Priority

- Loop 101 widening, including HOV lanes
- I-17 north of Loop 101, including HOV lanes
- Loop 303 south of US 60

Third Priority

- I-17 south of Loop 101
- Loop 303 north of US 60
- *I-17 south of Loop 101 – Option A*

Fourth Priority

- Loop 303 northern extension

Draft expressway/superstreet priorities were described as follows:

First Priority

- Grand Avenue, I-17 to Northern Avenue

Second Priority

- Northern Avenue superstreet

Third Priority

- Carefree Expressway
- Loop101/Loop 303 Connector Expressway
- Sun Valley Parkway

Draft highway/arterial priorities were described as follows:

First Priority

- Grand Avenue (Northern Avenue to Loop 303)
- Arterial improvements southeast of Loop 101

Second Priority

- Other arterial improvements

Third Priority

- Wickenburg Bypass

Draft transit priorities were described as follows:

First Priority

- Fixed route transit improvements

Second Priority (alignments not specified)

- Light rail transit
- Bus rapid transit

Third Priority

- Commuter rail

Draft priorities for other factors were described as follows:

First Priority

- Elimination of scalloped streets

Second Priority

- Preserve right-of-way

Next, Steve presented traffic volume maps and level of service maps for each of the networks described (see attachment).

QUESTIONS/COMMENTS SUMMARY

Transit

Q: Costs include interchange enhancements, but what about arterial to HOV ramps?

A: Those costs are included in the HOV costs.

- Add a bus rapid transit/express bus contingency in the event Grand Avenue doesn't develop as an LRT/commuter rail corridor.
- RPTA would like to see more connections to transit facilities, e.g., park-and-ride lots, HOV facilities. Glendale and Phoenix would like to add HOV ramps to and from the west at 79th Avenue and at Metrocenter.

Facility Designation

- Don't show Wickenburg bypass or Patton Road as a rural expressway, rather, list as a rural right-of-way corridor.
- Jomax should be shown as a limited access all the way across the New Highways network.

- El Mirage Road should be identified as a special facility (partial access-controlled).

Priorities

- Add “arterial grid continuity” to list of priorities for other factors.
- Add “consistency with 1985 plan” to appropriate priorities list(s)

Miscellaneous

- Wickenburg wants Canamex to extend north, serving as the Wickenburg Bypass.

FEEDBACK FORM RESULTS

A survey document was provided for attendees to record additional comments. Two forms were returned – one from City of Glendale and one from ADOT. The City of Glendale has listed their top 5 priorities for transportation improvement projects as follows:

- Northern Avenue superstreet, Grand Avenue to Loop 303
- Agua Fria/Loop 101 improvements; SOV and HOV lanes, HOV ramps, auxiliary lanes, traffic interchange
- Loop 303, I-10 to I-17; complete as freeway on Lone Mountain alignment
- Light rail transit from 19th Avenue to downtown Glendale and to Loop 101
- Grand Avenue – access control, beautification, grade separations and BRT service

City of Glendale also submitted the following additional comments:

- Complete composite Grand Avenue projects as soon as possible
- Develop BRT concept for Grand Avenue
- Include El Mirage Parkway from Loop 303 to Northern Avenue
- Include Jomax Parkway from Loop 101 to Buckeye.

ADOT listed their top 5 priorities as follows:

- I-17 north of Loop 101 (with HOV), Loop 101 to Anthem – 14 miles
- I-10 west of Loop 101 (with HOV), Loop 101 to Loop 303 (Cotton Lane) – 10 miles
- Loop 303 south of US 60 to I-10
- I-10 east of Loop 101 (with HOV), Loop 101 to 7th Avenue
- Loop 303, Lake Pleasant Road to I-17
- Loop 303/Loop 101 connector

Additional comments submitted by ADOT are listed below:

- Grand Avenue, I-17 to Loop 101, is currently shown as too high of a priority. Assuming an expressway is not viable since there is no reasonable, cost-effective way to exit traffic onto I-17 or into downtown, additional intersection improvements make some sense.
- Loop 303/Loop 101 connector: this project should take a higher priority since it will provide much needed local through-traffic connectivity in that area.
- The Northern Avenue superstreet is currently shown as too high of a priority. It would function similar to Grand Avenue between Loop 101 and I-17.

- Grand Avenue, Loop 101 to Loop 303 is currently shown as too high of a priority. The recommended improvement provides very little additional capacity, especially considering a key intersection improvement (at Bell Road) is not shown as a recommendation.

NEXT STEPS

Comments on the draft materials presented today were requested by Friday, February 28, 2003.

PUBLIC MEETINGS

September 17, 2002 Public Meeting Summary

6 – 8 p.m.

Glendale Community College, Student Lounge

ATTENDEES:

Boggs	Stuart	Valley Metro
Bresnahan	Jorie	Parsons Brinckerhoff
Brilz	Mike	Sunbelt Holding
Burrows	David	CMX LLC
Drew	Dan	
Gooner	Rosemary	
Grover	Allan	City of Glendale
Gruver	Terry	Parsons Brinckerhoff
Gutier	Miryam	City of Surprise
Hayden	Bill	ADOT
Hershfield	Peter	Candidate AZ House Dist 9
Herzog	Roger	MAG
Hogan	Steve	Parsons Brinckerhoff
Hunter	Craig	Phoenix Holdings
Johnson	Terry	Glendale
Jurado	Carlos	MAG
Kist	Debra	G.C.B.R.D.
Lance	Dan	ADOT
Lipson	J. Howard	Coyotes Lobes Suburban
Lugo	James	Glendale
Lund	Mickey	
McAllister	Shirley	Sun City
Miles	Roger	JACOBS Civil Inc.
Mourey	Mark	Stantec
Murphy	Marge	Sun City Home Owners
O'Hare	Jon	MCDOT
Pupo	Bill	City of Surprise
Shimmin	Chuck	Sun City Grand Coalition
Shimmin	Bear	Sun City Grand Coalition
Smith	Andy	ADOT-TPD
Spiers	Bob	Stardust Development, Inc
Tuttle	Lyle	
Voigt	Chris	MAG

Overview of Meeting

The meeting began with an overview of the study purpose, schedule, and status. (Presentation attached). Following the presentation, the meeting was opened to all for a Q&A session.

Comments/concerns from participants are listed below.

1. Include unincorporated areas in the study
2. East-west mobility is issue (Bell Road, Sun Valley Parkway)
3. Need definitions of the various street classifications, e.g., "superstreet," "freeway," "parkway"
4. Should adopt the federal definition of roadway designations
5. Connections to Buckeye, given large population and employment projections
6. Canamex implementation timeline
7. Canamex (defined as Wickenburg Rd./Vulture Mine Rd.) doesn't meet roadway requirements and is not funded.
8. Regarding traffic bound for Yucca Mountain, should investigate possible funding from other states or the federal government
9. Commuter rail vs. light rail: how they are interconnected and what areas they will serve
10. Transit must be addressed regionally (i.e., planning, service).
11. Explore pros/cons of toll roads
12. 303 funding: can 303 be built without the ½-cent sales tax extension?
13. Phased implementation of 303
14. General public needs more basic information about the economics of our transportation system.
15. Grand Avenue study status and likelihood of grade
16. Grand Avenue should be "high priority" project

Summary of Comment Forms

Total received: 3

1. What is the plan for 103rd Avenue and Grand? Will there be a tunnel under Grand Avenue because of access to Boswell Hospital? A top priority is to bypass our area with the trucks carrying nuclear waste to Yucca Mountain. Can the other states help pay for a special route to Nevada (or the federal government)? (Marge Murphy, Sun City)
2. Better planning and studies need to be made for east-west connection around the White Tanks from the huge growth about to happen in surprise and buckeye. Consider making Bell Road/Sun Valley Parkway a super street or some type of east-west freeway.

Loop 303 will be vital to the mobility of the West Valley as there is enormous growth happening and planned along this corridor up to Surprise. Engineering and construction of Loop 303 as a full freeway tying into I-10 needs to happen now, not waiting for the area to be a transportation nightmare. Action should be taken now, not delaying due to ½-cent sales tax extension until it's too late. (David Burrows, Phoenix)

3. Bell Road in the area of 119th Avenue/Avenue of the Arts/116th Avenue, Union Hills at 107th Avenue and from 99th Avenue to 107th Avenue. Beardsley needs to extend west to El Mirage. (Lyle Tuttle, Surprise)

April 29, 2003 Public Meeting Summary

5:00 – 7:00 p.m.

Alta Loma Elementary School, Multi-purpose Room, 9750 N. 87th Avenue, Peoria, Arizona

ATTENDEES:

Overmeyer	Randall	City of Surprise
Moody	Dave	City of Peoria
Grover	Allan	City of Glendale
Gruver	Terry	Parsons Brinckerhoff
Pirooz	Brian	City of Surprise
Hogan	Steve	Parsons Brinckerhoff
Voigt	Chris	MAG

The meeting was held in an open house format. Display boards were presented showing:

- Current, Future Base, and New Corridor traffic volumes;
- Preliminary Priority Summary map;
- Preliminary Near-Term, Mid-Term, and Long-Term projects maps;
- Recommended non-motorized corridors; and
- Tables listing lanes added and preliminary cost estimates for the draft projects shown on the maps.

NWATS Final Report
Appendix 3

Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
McDowell Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	67th Avenue	75th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	2	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	83rd Avenue	91st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	El Mirage Road	Dysart Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Dysart Road	Litchfield Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Litchfield Road	Bullard Drive	1	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Bullard Drive	Estrella Pwky (Pebblecreek)		<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Estrella Pwky (Pebblecreek)	Cotton Lane	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Cotton Lane	Citrus Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Citrus Road	Perryville Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	3	
McDowell Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	2	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	83rd Avenue	91st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	El Mirage Road	Dysart Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Dysart Road	Litchfield Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Litchfield Road	Bullard Drive	1	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Bullard Drive	Estrella Pwky (Pebblecreek)		<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Estrella Pwky (Pebblecreek)	Cotton Lane	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Cotton Lane	Citrus Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Citrus Road	Perryville Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	3	

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
 Source 3: Southwest Valley Transportation Study (1995)

NWATS Final Report
Appendix 3

Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Thomas Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	67th Avenue	75th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	75th Avenue	83rd Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	83rd Avenue	91st Avenue		2	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue		2	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	1	2	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	1	2	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	1	1	<u>1</u>	1	<u>2</u>	3
	El Mirage Road	Dysart Road	2	1	<u>1</u>	1	<u>2</u>	3
	Dysart Road	Litchfield Road	2	2	<u>2</u>	2	<u>2</u>	3
	Litchfield Road	Reems Road	1	1	<u>2</u>	2	<u>2</u>	3
	Estrella Pwky (Pebblecreek)	Cotton Lane		2	<u>2</u>	2	<u>2</u>	3
	Cotton Lane	Citrus Road		2	<u>2</u>	2	<u>2</u>	3
	Citrus Road	Perryville Road	1	1	<u>1</u>	1	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	1	<u>1</u>	1	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue							
Thomas Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	75th Avenue	83rd Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	83rd Avenue	91st Avenue		2	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue		2	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	1	2	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	1	2	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	1	1	<u>1</u>	1	<u>2</u>	3
	El Mirage Road	Dysart Road	2	1	<u>1</u>	1	<u>2</u>	3
	Dysart Road	Litchfield Road	2	2	<u>2</u>	2	<u>2</u>	3
	Litchfield Road	Reems Road	1	1	<u>2</u>	2	<u>2</u>	3
	Estrella Pwky (Pebblecreek)	Perryville Road		2	<u>2</u>	2	<u>2</u>	3
	Cotton Lane	Citrus Road		2	<u>2</u>	2	<u>2</u>	3
	Citrus Road	Perryville Road	1	1	<u>1</u>	1	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	1	<u>1</u>	1	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue							

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Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Indian School Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	67th Avenue	75th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	75th Avenue	83rd Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	83rd Avenue	91st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	El Mirage Road	Dysart Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Dysart Road	Litchfield Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Litchfield Road	Reems Road	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	3
	Reems Road	Sarival Avenue	1	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Sarival Avenue	Cotton Lane	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Cotton Lane	Citrus Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Citrus Road	Perryville Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue							
Indian School Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	83rd Avenue	91st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	91st Avenue	99th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	99th Avenue	107th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	107th Avenue	115th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	El Mirage Road	Dysart Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Dysart Road	Litchfield Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Litchfield Road	Reems Road	1	<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>	3
	Reems Road	Sarival Avenue	1	<u>1</u>	<u>2</u>	<u>3</u>	<u>3</u>	3
	Sarival Avenue	Cotton Lane	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Cotton Lane	Citrus Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
	Citrus Road	Perryville Road	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue							

Source 1: City of Glendale Transportation Plan (Dec 200)
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Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Camelback Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	3	3	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	3	1,2
	83rd Avenue	91st Avenue	2	2	3	<u>3</u>	3	1,2
	91st Avenue	99th Avenue	2	2	3	<u>3</u>	3	1,2
	99th Avenue	107th Avenue	1	2	3	<u>3</u>	<u>3</u>	2
	107th Avenue	115th Avenue	2	2	2	<u>2</u>	<u>2</u>	2,3
	115th Avenue	El Mirage Road	2	2	2	2	<u>2</u>	2,3
	El Mirage Road	Dysart Road	2	2	2	2	1	1,2,3
	Dysart Road	Litchfield Road	2	2	2	2	1	1,2,3
	Litchfield Road	Reems Road	1	1	1	2	<u>2</u>	2,3
	Reems Road	Sarival Avenue	1	1	1	2	1	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	2	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	1	1	1	1	1,2,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	
Camelback Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	3	3	2	2	1,2
	75th Avenue	83rd Avenue	2	2	3	3	3	1,2
	83rd Avenue	91st Avenue	2	2	3	3	3	1,2
	91st Avenue	99th Avenue	2	2	3	3	3	1,2
	99th Avenue	107th Avenue	1	2	3	3	<u>3</u>	2
	107th Avenue	115th Avenue	2	2	2	2	<u>2</u>	2,3
	115th Avenue	El Mirage Road	2	2	2	2	<u>2</u>	2,3
	El Mirage Road	Dysart Road	2	2	2	2	1	1,2,3
	Dysart Road	Litchfield Road	2	2	2	2	1	1,2,3
	Litchfield Road	Reems Road	1	1	1	2	<u>2</u>	2,3
	Reems Road	Sarival Avenue	1	1	1	2	1	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	2	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	1	1	1	1	1,2,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	

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NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Bethany Home Road WB	43rd Avenue	51st Avenue	2				2	1
	51st Avenue	59th Avenue	2				2	1
	59th Avenue	67th Avenue	2				2	1
	67th Avenue	75th Avenue	1	2	3	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	1	2	2	<u>2</u>	2	1,2
	83rd Avenue	91st Avenue					2	1
	91st Avenue	99th Avenue					2	1
	99th Avenue	107th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	107th Avenue	115th Avenue						
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road	1	<u>1</u>	<u>1</u>	<u>1</u>	1	1
	Dysart Road	Litchfield Road	1					
	Litchfield Road	Reems Road						
	Reems Road	Sarival Avenue					1	1,2
	Sarival Avenue	Cotton Lane	1	1	1	1	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	<u>1</u>	<u>1</u>	1	1	1,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	
Bethany Home Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	3	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	2	1,2
	83rd Avenue	91st Avenue					2	1
	91st Avenue	99th Avenue					2	1
	99th Avenue	107th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	107th Avenue	115th Avenue						
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road	1	<u>1</u>	<u>1</u>	<u>1</u>	1	1
	Dysart Road	Litchfield Road	1					
	Litchfield Road	Reems Road						
	Reems Road	Sarival Avenue					1	1
	Sarival Avenue	Cotton Lane	1	1	1	1	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	<u>1</u>	<u>1</u>	1	1	1,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	

Source 1: City of Glendale Transportation Plan (Dec 200)
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NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Glendale Avenue WB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	3	1
	67th Avenue	75th Avenue	3	2	3	<u>3</u>	3	1,2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	3	1,2
	83rd Avenue	91st Avenue	2	2	3	<u>3</u>	3	1,2
	91st Avenue	99th Avenue	2	2	3	<u>3</u>	3	1,2
	99th Avenue	107th Avenue	2	2	3	<u>3</u>	3	1,2
	107th Avenue	115th Avenue	2	2	3	<u>2</u>	3	1,2,3
	115th Avenue	El Mirage Road	2	2	3	2	3	1,2,3
	El Mirage Road	Dysart Road	2	2	2	2	3	1,2,3
	Dysart Road	Litchfield Road	2	2	2	2	3	1,2,3
	Litchfield Road	Reems Road						
	Reems Road	Sarival Avenue	1	1	1	1	1	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	1	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	1	1	1	1	1,2,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	
Glendale Avenue EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	3	1
	67th Avenue	75th Avenue	2	2	3	<u>3</u>	3	1,2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	3	1,2
	83rd Avenue	91st Avenue	2	2	3	<u>3</u>	3	1,2
	91st Avenue	99th Avenue	2	2	3	<u>3</u>	3	1,2
	99th Avenue	107th Avenue	2	2	3	<u>3</u>	3	1,2
	107th Avenue	115th Avenue	2	2	3	<u>2</u>	3	1,2,3
	115th Avenue	El Mirage Road	2	2	3	2	3	1,2,3
	El Mirage Road	Dysart Road	2	2	2	2	3	1,2,3
	Dysart Road	Litchfield Road	2	2	2	2	3	1,2,3
	Litchfield Road	Reems Road						
	Reems Road	Sarival Avenue	1	1	1	1	1	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	1	1	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	1	1,2,3
Citrus Road	Perryville Road	1	1	1	1	1	1,2,3	
Perryville Road	Jackrabbit Trail (195th Ave)				1	<u>2</u>	3	

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
 Source 3: Southwest Valley Transportation Study (1995)

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Appendix 3

Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Northern Avenue WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	3	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	3	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	3	1,2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	3	1,2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	3	1,2
	99th Avenue	107th Avenue	1	2	2	<u>2</u>	3	1,2
	107th Avenue	115th Avenue	1	2	2	<u>2</u>	3	1,2
	115th Avenue	El Mirage Road	1	2	2	<u>2</u>	3	1,2
	El Mirage Road	Dysart Road	1	2	2	2	3	1,2,3
	Dysart Road	Litchfield Road	1	2	2	2	3	1,2,3
	Litchfield Road	Reems Road	1	1	2	2	3	1,2,3
	Reems Road	Sarival Avenue	1	1	1	2	3	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	1	3	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	2	1,2,3
	Citrus Road	Perryville Road	1	1	1	1	2	1,2,3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>1</u>	1	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Northern Avenue EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	3	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	3	1,2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	3	1,2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	3	1,2
	99th Avenue	107th Avenue	1	2	2	<u>2</u>	3	1,2
	107th Avenue	115th Avenue	1	2	2	<u>2</u>	3	1,2
	115th Avenue	El Mirage Road	1	2	2	<u>2</u>	3	1,2
	El Mirage Road	Dysart Road	1	2	2	2	3	1,2,3
	Dysart Road	Litchfield Road	1	2	2	2	3	1,2,3
	Litchfield Road	Reems Road	1	1	2	2	3	1,2,3
	Reems Road	Sarival Avenue	1	1	1	2	3	1,2,3
	Sarival Avenue	Cotton Lane	1	1	1	1	3	1,2,3
	Cotton Lane	Citrus Road	1	1	1	1	2	1,2,3
	Citrus Road	Perryville Road	1	1	1	1	2	1,2,3
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>1</u>	1	<u>2</u>	3	
Jackrabbit Trail (195th Ave)	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
 Source 3: Southwest Valley Transportation Study (1995)

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Dunlap/Olive Avenue WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road	2	2	2	<u>2</u>	<u>2</u>	2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	1	1	<u>1</u>	1	1,2
	Litchfield Road	Reems Road	1	1	1	<u>1</u>	1	1,2
	Reems Road	Sarival Avenue	1	1	1	<u>1</u>	1	1,2
	Sarival Avenue	Cotton Lane	1	1	1	<u>1</u>	1	1,2
	Cotton Lane	Citrus Road	1	1	1	<u>1</u>	1	1,2
Citrus Road	Perryville Road	1	1	1	<u>1</u>	1	1,2	
Perryville Road	Jackrabbit Trail (195th Ave)							
Dunlap/Olive Avenue EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road	2	2	2	<u>2</u>	<u>2</u>	2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	1	1	<u>1</u>	1	1,2
	Litchfield Road	Reems Road	1	1	1	<u>1</u>	1	1,2
	Reems Road	Sarival Avenue	1	1	1	<u>1</u>	1	1,2
	Sarival Avenue	Cotton Lane	1	1	1	<u>1</u>	1	1,2
	Cotton Lane	Citrus Road	1	1	1	<u>1</u>	1	1,2
Citrus Road	Perryville Road	1	1	1	<u>1</u>	1	1,2	
Perryville Road	Jackrabbit Trail (195th Ave)							

Source 1: City of Glendale Transportation Plan (Dec 200)
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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Peoria Avenue WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	1	1	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road						2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	2	2	<u>1</u>	1	1,2
	Litchfield Road	Reems Road	1	1	1	<u>1</u>	1	1,2
	Reems Road	Sarival Avenue	1	1	1	<u>1</u>	1	1,2
	Sarival Avenue	Cotton Lane	1	1	1	<u>1</u>	1	1,2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>1</u>	1	1
Citrus Road	Perryville Road	1	<u>1</u>	<u>1</u>	<u>1</u>	1	1	
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Peoria Avenue EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	1	1	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road						2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	2	2	<u>1</u>	1	1,2
	Litchfield Road	Reems Road	1	1	1	<u>1</u>	1	1,2
	Reems Road	Sarival Avenue	1	1	1	<u>1</u>	1	1,2
	Sarival Avenue	Cotton Lane	1	1	1	<u>1</u>	1	1,2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>1</u>	1	1
Citrus Road	Perryville Road	1	<u>1</u>	<u>1</u>	1	1	1	
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Cactus Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue						
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	El Mirage Road	Dysart Road	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	Dysart Road	Litchfield Road	1	1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	1	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
Citrus Road	Perryville Road	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Cactus Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue						
	115th Avenue	El Mirage Road	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	El Mirage Road	Dysart Road	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	Dysart Road	Litchfield Road	1	1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	1	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
Citrus Road	Perryville Road	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Perryville Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>		

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Thunderbird Road/Waddell Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	107th Avenue	115th Avenue	1	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road	2	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	1	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2	
Citrus Road	Perryville Road							
Thunderbird Road/Waddell Road EB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	75th Avenue	83rd Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	83rd Avenue	91st Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	2	3	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	107th Avenue	115th Avenue	1	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road	2	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	El Mirage Road	Dysart Road	1	1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	1	1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	1	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2	
Citrus Road	Perryville Road							

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Greenway Road WB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	4	<u>3</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	4	<u>3</u>	2	1
	67th Avenue	75th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	2	
	75th Avenue	83rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	2	
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road	1	2	2	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	2	2	2	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	2	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	Citrus Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Greenway Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	4	<u>3</u>	2	1
	59th Avenue	67th Avenue	2	<u>2</u>	4	<u>3</u>	2	1
	67th Avenue	75th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road	1	2	2	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road	2	2	2	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road	1	1	2	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	Sarival Avenue	Cotton Lane	1	1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	Citrus Road	Jackrabbit Trail (195th Ave)	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
 Source 3: Southwest Valley Transportation Study (1995)

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Bell Road WB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	3	3	3	<u>3</u>	3	1,2
	75th Avenue	83rd Avenue	4	4	4	<u>4</u>	3	1,2
	83rd Avenue	91st Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	107th Avenue	115th Avenue	3	4	4	<u>4</u>	<u>4</u>	2
	115th Avenue	El Mirage Road	3	4	4	<u>4</u>	<u>4</u>	2
	El Mirage Road	Dysart Road	3	3	3	<u>3</u>	<u>3</u>	2
	Dysart Road	Litchfield Road	3	3	3	<u>3</u>	<u>3</u>	2
	Litchfield Road	Reems Road	3	3	3	<u>3</u>	<u>3</u>	2
	Reems Road	Sarival Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	Sarival Avenue	Cotton Lane	3	3	3	<u>3</u>	<u>3</u>	2
	Cotton Lane	Citrus Road	3	3	3	<u>3</u>	<u>3</u>	2
Citrus Road	Perryville Road	2	3	3	<u>3</u>	<u>3</u>	2	
Perryville Road	Jackrabbit Trail (195th Ave)	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>		
Bell Road EB	43rd Avenue	51st Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	67th Avenue	75th Avenue	3	3	3	<u>3</u>	3	1,2
	75th Avenue	83rd Avenue	4	4	4	<u>4</u>	3	1,2
	83rd Avenue	91st Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	107th Avenue	115th Avenue	3	4	4	<u>4</u>	<u>4</u>	2
	115th Avenue	El Mirage Road	3	4	4	<u>4</u>	<u>4</u>	2
	El Mirage Road	Dysart Road	3	3	3	<u>3</u>	<u>3</u>	2
	Dysart Road	Litchfield Road	3	3	3	<u>3</u>	<u>3</u>	2
	Litchfield Road	Reems Road	3	3	3	<u>3</u>	<u>3</u>	2
	Reems Road	Sarival Avenue	3	3	3	<u>3</u>	<u>3</u>	2
	Sarival Avenue	Cotton Lane	3	3	3	<u>3</u>	<u>3</u>	2
	Cotton Lane	Citrus Road	3	3	3	<u>3</u>	<u>3</u>	2
Citrus Road	Perryville Road	2	3	3	<u>3</u>	<u>3</u>	2	
Perryville Road	Jackrabbit Trail (195th Ave)	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>		

Source 1: City of Glendale Transportation Plan (Dec 200)
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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Union Hills Drive WB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	2	1,2
	83rd Avenue	91st Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road						
Union Hills Drive EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	3	<u>3</u>	<u>3</u>	<u>3</u>	3	1
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	2	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	2	1,2
	83rd Avenue	91st Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	91st Avenue	99th Avenue	2	2	3	<u>3</u>	<u>3</u>	2
	99th Avenue	107th Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	115th Avenue	El Mirage Road						
Beardsley Road WB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	83rd Avenue	91st Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
107th Avenue	115th Avenue	2	1	1	<u>2</u>	<u>2</u>	2	
Beardsley Road EB	43rd Avenue	51st Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	51st Avenue	59th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	59th Avenue	67th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	75th Avenue	83rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	83rd Avenue	91st Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue	2	2	2	<u>2</u>	<u>2</u>	2
107th Avenue	115th Avenue	2	1	1	<u>2</u>	<u>2</u>	2	

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Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Deer Valley Road WB	59th Avenue	67th Avenue					1	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	2	2
	83rd Avenue	91st Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue		1	<u>2</u>	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue		1	<u>2</u>	<u>2</u>	<u>2</u>	
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road		1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road		1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road		2	2	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue						
	Sarival Avenue	Cotton Lane		1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road		1	1	<u>2</u>	<u>2</u>	2
Citrus Road	Perryville Road		1	1	<u>2</u>	<u>2</u>	2	
Perryville Road	Jackrabbit Trail (195th Ave)							
Deer Valley Road EB	59th Avenue	67th Avenue					1	1
	67th Avenue	75th Avenue	2	2	2	<u>2</u>	2	1,2
	75th Avenue	83rd Avenue	2	2	2	<u>2</u>	2	2
	83rd Avenue	91st Avenue	1	2	2	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	1	<u>2</u>	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue		1	<u>2</u>	<u>2</u>	<u>2</u>	2
	107th Avenue	115th Avenue		1	<u>2</u>	<u>2</u>	<u>2</u>	
	115th Avenue	El Mirage Road						
	El Mirage Road	Dysart Road		1	1	<u>2</u>	<u>2</u>	2
	Dysart Road	Litchfield Road		1	1	<u>2</u>	<u>2</u>	2
	Litchfield Road	Reems Road		2	2	<u>2</u>	<u>2</u>	2
	Reems Road	Sarival Avenue						
	Sarival Avenue	Cotton Lane		1	1	<u>2</u>	<u>2</u>	2
	Cotton Lane	Citrus Road		1	1	<u>2</u>	<u>2</u>	2
Citrus Road	Perryville Road		1	1	<u>2</u>	<u>2</u>	2	
Perryville Road	Jackrabbit Trail (195th Ave)							
Pinnacle Peak Rd WB	51st Avenue	59th Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	59th Avenue	67th Avenue						
	67th Avenue	75th Avenue	1	1	1	<u>1</u>	1	1,2
	75th Avenue	83rd Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	1	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue						
Pinnacle Peak Rd EB	51st Avenue	59th Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	59th Avenue	67th Avenue						
	67th Avenue	75th Avenue	1	1	1	<u>1</u>	1	1,2
	75th Avenue	83rd Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	1	1	1	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	1	2	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue						
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Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
<u>1</u>	99th Avenue	107th Avenue						

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Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Happy Valley Road WB	51st Avenue	55th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	55th Avenue	61st Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	61st Avenue	67th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue						
	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	195th Avenue	211th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	211th Avenue	219th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
Happy Valley Road EB	51st Avenue	55th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	55th Avenue	61st Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	61st Avenue	67th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	83rd Avenue	91st Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	91st Avenue	99th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	99th Avenue	107th Avenue						
	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	195th Avenue	211th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2
	211th Avenue	219th Avenue	1	<u>1</u>	1	<u>2</u>	<u>2</u>	2

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Jomax Road WB	63rd Avenue	67th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	91st Avenue	99th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	99th Avenue	107th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	107th Avenue	115th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	Litchfield Road	155th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	155th Avenue	163rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	163rd Avenue	Citrus Road						
	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	195th Avenue	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Jomax Road EB	63rd Avenue	67th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	67th Avenue	75th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	91st Avenue	99th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	99th Avenue	107th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	107th Avenue	115th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	Litchfield Road	155th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	155th Avenue	163rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	163rd Avenue	Citrus Road						
	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	195th Avenue	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Patton Road WB	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	195th Avenue	203rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	203rd Avenue	207th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	207th Avenue	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	211th Avenue		1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Patton Road EB	US 60/Grand Avenue	195th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	195th Avenue	203rd Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	203rd Avenue	207th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	207th Avenue	211th Avenue	1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
	211th Avenue		1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	

Source 1: City of Glendale Transportation Plan (Dec 200)
 Source 2: Northwest Valley Transportation Study (June 2001)
 Source 3: Southwest Valley Transportation Study (1995)

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Planned Thru Lanes - Westbound and Eastbound Routes

Segment			EXIST THRU LANES	PLANNED LANES 2003/2006*	PLANNED THRU LANES 2010	PLANNED THRU LANES 2020	PLANNED THRU LANES 2025	SOURCE
NB	FROM	TO						
SB	TO	FROM						
Underlined values are estimated from either the previous "Planned Thru" or are based on an ultimate arterial section of four lanes.								
Carefree Highway (74) WB	5100 W	5500 W	1	1	1	1	<u>2</u>	2
	5500 W	6700 W	1	1	1	1	<u>2</u>	2
	6700 W	7500 W	1	1	1	1	<u>2</u>	2
	7500 W	8300 W	1	1	1	1	<u>2</u>	2
	8300 W	Lake Pleasant Road	1	1	1	1	<u>2</u>	2
	Lake Pleasant Road	9100 W	1	1	1	1	<u>2</u>	2
Carefree Highway (74) EB	5100 W	5500 W	1	1	1	1	<u>2</u>	2
	5500 W	6700 W	1	1	1	1	<u>2</u>	2
	6700 W	7500 W	1	1	1	1	<u>2</u>	2
	7500 W	8300 W	1	1	1	1	<u>2</u>	2
	8300 W	Lake Pleasant Road	1	1	1	1	<u>2</u>	2
	Lake Pleasant Road	9100 W	1	1	1	1	<u>2</u>	2
R.H. Johnson Boulevard NB	Bell Road	Garden Drive	3	3	3	<u>3</u>	<u>3</u>	2
	Garden Drive	Camino Del Sol	3	3	3	<u>3</u>	<u>3</u>	2
	Camino Del Sol	Meeker Boulevard	3	3	3	<u>3</u>	<u>3</u>	2
	Meeker Boulevard	Stardust Boulevard	2	2	2	<u>2</u>	<u>2</u>	2
	Stardust Boulevard	Grand Avenue	2	2	2	<u>2</u>	<u>2</u>	2
R.H. Johnson Boulevard SB	Bell Road	Garden Drive	3	3	3	<u>3</u>	<u>3</u>	2
	Garden Drive	Camino Del Sol	3	3	3	<u>3</u>	<u>3</u>	2
	Camino Del Sol	Meeker Boulevard	3	3	3	<u>3</u>	<u>3</u>	2
	Meeker Boulevard	Stardust Boulevard	2	2	2	<u>2</u>	<u>2</u>	2
	Stardust Boulevard	Grand Avenue	2	2	2	<u>2</u>	<u>2</u>	2
Constellation Rd WB from Vulture Mine Rd to US 60			2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Constellation Rd EB from US 60 to Vulture Mine Rd			2	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	
US Route 93 WB from Constellation Rd to Rincon Rd			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
US Route 93 WB from Rincon Rd to Vulture Mine Rd			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
US Route 93 EB from Vulture Mine Rd to Rincon Rd			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
US Route 93 WB from Rincon Rd to Constellation Rd			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Vulture Mine Rd NB from US Route 60 to US Route 93			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	
Vulture Mine Rd SB from US Route 93 to US Route 60			1	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	

Source 1: City of Glendale Transportation Plan (Dec 200)
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GLOSSARY

Segment	Denotes the section of road being surveyed between two intersections		
Exist Thru Lanes	The prevailing number of thru lanes in one direction between specified intersections		
Speed Limit (mph)	The prevailing posted speed limit in one direction between specified intersections. Given in miles per hour		
Pavement Survey	The prevailing condition of pavement, Good, Fair, or Poor, in one direction between specified intersections. Criteria for Good, Fair, and Poor given below		
	Good	Fair	Poor
Alligator cracking	Less than 1In ft of cracking/sq yd	Between 1 & 5 linear feet of cracking/sq yd of pavement	More than 5 In ft of cracking/sq yd of pavement
	Cracks less than 1/16" wide	Cracks between 1/16" and 1/8" wide	Cracks more than 1/8" wide
Rutting and swelling	Depth of rut or swell negligible	Depth of rut or swell less than 1/2"	Depth of rut or swell more than 1/2"
Raveling and weathering	No loose aggregate	Minimal loose aggregate	Loose aggregate
	Pavement appears to be less than 1 year old	Some appearance of aging and weathering	Road appears old and weathered
Potholes	No potholes	Few potholes with minimal effect to drivability	Potholes apparent and cause driver distraction
Patch Conditions	Patches have smooth transition	Patches have minor transition	Transverse cracking in patches or rough transition
	Patches at grade with roadway surface	Patches have minor grade difference with roadway	Patch not at roadway grade
Discontinuous Section	Denotes whether section between the two specified intersections is existent, and if it is non-existent, why. Examples of obstructions that were observed include canals, rivers, and mountains		
Bus Bay Pull-outs	Denotes the number bus bay pullouts and bus stops in one direction between specified intersections. i.e.. <i>There are 2 pullouts and 5 bus stops on one side of the road; the Bus Bay Pull-outs is reported as 2 of 5.</i> <i>Definition: bus bay pull out - a lane or out-cove designed for a bus to pull out of the main flow of traffic.</i>		
Median Type	Denotes the type of median between two specified intersections. Median type is the same for both directions in the same segment. Possible median types are Two-Way Turn, Raised, None, or <i>specified</i>		
Side Walk	Denotes whether sidewalk is present on the specified side of the road between two specified intersections.		
Curb/Gutter	Denotes whether Curb and Gutter is present on the specified side of the road between two specified intersections.		
Bike Lane	Denotes whether a Bike Lane or Bike Route is present on the specified side of the road between two specified intersections. <i>Definition: bike lane - has a minimum width of 5 feet, pavement marked with "diamonds", and a "BIKE LANE" sign is posted.</i> <i>Definition: bike route - has a green "BIKE ROUTE" sign posted</i>		