MAG Long Range Transportation Plan 2001 Update

MARICOPA ASSOCIATION of GOVERNMENTS July 2001

Maricopa Association of Governments

Long Range Transportation Plan
2001 Update

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MAG LONG RANGE TRANSPORTATION PLAN
SUMMARY AND 2001 UPDATE

EXECUTIVE SUMMARY

The Maricopa Association of Governments (MAG) Long Range Transportation Plan (LRTP) addresses all modes of transportation in the region. This Plan is usually updated each year and is based on a 20 year, or longer, time horizon. In this 2001 Update, the time horizon of the Plan is extended from 2020 to 2021. This document summarizes the current status of the Plan and highlights any changes made since approval of the 2000 Plan Update.

OUTLOOK

Over the life of this Plan, resident population in Maricopa County is projected to increase almost 50 percent, while regional travel is projected to increase approximately 58 percent. In response to this growth, the MAG LRTP calls for a considerable expansion of regional transportation facilities. Some of the planned expansions to roadways and transit services include:

- a 66 percent increase in freeway/expressway lane-miles,
- nearly a 45 percent increase in street lane miles,
- a tripling of local bus services,
- a quadrupling of express and commuter bus service, and
- a 39-mile light rail transit system.

Even with these expansions to the regional transportation system, congestion levels are projected to increase. However, average traffic speeds are projected to remain about the same, because population growth occurs primarily in outlying areas that currently experience little congestion and planned freeways will be completed throughout the region. Without the planned improvements (No-Build), peak hour speeds are projected to decline and congestion levels per mile of travel are projected to double.

FINANCE

The Transportation Equity Act for the 21st Century requires the MAG LRTP to include a balanced funding plan. The MAG funding plan is based on a trend funding concept, that is, current transportation revenue sources are assumed to continue in the future with periodic adjustments for growth and inflation as needed.

For example, it is assumed that local contributions to transit and street construction will continue in the future. Private contributions to street construction are also projected to continue. Federal funding is projected to continue, but at a declining rate in constant dollar terms. At the State level, it is assumed that there will be periodic adjustments in the gasoline tax rate (or equivalent funding) to keep pace with inflation, and that a fair share of these funds will be allocated to the MAG region.

Potential "new" funding sources under consideration are actually variations of historic sources needed to maintain a trend level of commitment to meet ongoing regional transportation needs in this high growth area. The last increase in the gas tax in Arizona was in 1990. Since that time fuel taxes per mile of travel have slowly eroded from inflation and more fuel efficient vehicles. This analysis assumes that the equivalent of a ten cent fuel tax occurs in 2002 and that Arizona fuel taxes are indexed for inflation at that time. Regional or State sales taxes could also raise funding of this magnitude. This 2001 Update of the MAG LRTP also recognizes the end of the one-half cent sales tax for freeways in 2005, and includes the equivalent of nearly a one-half cent sales tax for transit. Passage of transit sales tax initiatives in Tempe and Phoenix is a major step toward this level of funding.

FREEWAYS/EXPRESSWAYS

The 2001 Update of the LRTP is based on a fair share funding concept in which transportation taxes paid into state and national accounts are largely returned to the region for transportation improvements. Completion dates for new freeways are identified and additional improvements to existing regional routes are added to the LRTP. A county-wide map of the Regional Highway System is shown in Figure EX-1.

New Freeways. In 1985 voters approved a half-cent sales tax to fund new freeways and expressways in the region. Since 1985, the miles of new freeways in the region have more than doubled and 112 miles remain to be completed. In the 1998 Update of the LRTP, new freeways were to be completed by 2014. This update targets these facilities for completion by the year 2007. This acceleration will be largely accomplished with additional bonding. In January 2001, the MAG Regional Council approved the Lone Mountain alignment as the preferred option for the Loop 303 connection to I-17.

Existing Freeways. The MAG High Occupancy Vehicle (HOV) Plan provides overall direction for improvements to existing freeways. The highest MAG priorities for Arizona Department of Transportation (ADOT) discretionary funds in the region are completion of HOV lanes on the Black Canyon, Superstition and Squaw Peak, respectively. HOV lanes on the Black Canyon are now under construction and funding for HOV lanes on the Superstition and Squaw Peak have been programmed. The Long Range Transportation Plan also includes additional widening of the Black Canyon, and the Superstition east of Price Road, as well as collector/distributor roads between Baseline Road and 16th Street.

In January 2001, the MAG Regional Council approved the addition of twenty new park-and-ride lots to the LRTP recommended in the MAG Park-and-Ride Site Selection Study.

Regional Access Routes. Regional access routes into and out of the region are also part of the LRTP. To the northeast much, of State Route (SR) 87 has been widened to four lanes. To the northwest, final improvements to complete U.S. 60 as a four-lane facility have been programmed. Further widening of I-10, I-17 and S.R. 85 are part of this LRTP Update.

TRANSIT

The Regional Transit Plan is to triple local bus service, triple dial-a-ride service, quadruple express bus service and complete a 39 mile light rail transit system. Funding needed to support this plan is being actively pursed at the local, regional, state and federal level.

Fixed Route Bus Service. Fixed route bus service generally follows the mile grid street system of the Phoenix metropolitan area. The regional transit plan calls for nearly a tripling of revenue miles of service, with enhanced frequencies in areas having existing service and new service in areas currently unserved. Evening hours are extended and Sunday service is added.

Dial-a-Ride Service. Since 1992, the regional plan has supported tripling paratransit service. This plan remains intact with service doubling by 2010 and tripling by 2020.

Express and Bus Rapid Transit (BRT) Service. This Update quadruples the number of miles of express bus service (Figure EX-2). The planned express service is focused on meeting peak-period demand. Express bus service extends to outlying communities such as Carefree and Cave Creek. BRT is slated to begin service in 2003 on five routes serving Phoenix, Tempe and Chandler. BRT will utilize existing and planned High Occupant Vehicle (HOV) lanes on the regional freeway system. Commuter bus service would provide peak period service on weekdays to the communities of Buckeye, Gila Bend and Wickenburg. The system also includes park-and-ride lots and on-line stations which incorporate express bus, BRT, local bus, light rail, and shuttle services.

Shuttles/Circulators. Shuttles and neighborhood circulators are used to meet local circulation needs for the light rail system and express bus network, especially in central activity areas.

Light Rail Transit. The light rail transit (LRT) plan includes a 39-mile system (Figure EX-3). Elements of the LRT include provisions for park-and-ride lots and signal prioritization to improve speeds. Shuttle buses and an improved fixed route network also play an important role in the LRT system.

STREETS

Major arterial streets are generally located on the mile grid and carry most of the traffic in the region. The MAG Plan calls for approximately a 45 percent increase in major street lane mileage over the next 20 years. Most of these new lanes are located on the edge of the metropolitan area and are associated with new development. In built-up areas, streets are being widened to the usual standard of five or six through lanes. This Update incorporates the latest information on local street plans, updates the funding plan and extends the planning horizon to 2021.

AIRPORTS

An update of the MAG Regional Airport System Plan (RASP) was adopted by the MAG Regional Council in December, 1993. An Implementation Study, designed to facilitate carrying out the MAG RASP recommendations, was completed and approved by the MAG Regional Council in December, 1996 and a new plan update is underway. The latest projections indicate that air passenger demand at Sky Harbor will nearly double over the next 20 years, while general aviation demand is projected to increase 30 percent.

The MAG RASP includes 17 airports. Sky Harbor is the commercial service airport and Luke Air Force Base is a major military base. Reliever airports include Chandler, Glendale, Mesa - Falcon Field, Phoenix - Deer Valley and Phoenix - Goodyear. Williams Gateway Airport has been converted from a military base to a civilian airport serving commercial carrying cargo and general aviation. The MAG RASP calls for additional runways at Phoenix - Goodyear and Glendale. It also recommended a third runway at Phoenix Sky Harbor, which was implemented in October 2000. Runway extensions are proposed at Buckeye, Glendale, Mesa - Falcon Field and Wickenburg. The Plan recommends that potential sites for a new general aviation airport be investigated for potential implementation beyond twenty years.

BICYCLES

The MAG Bicycle Plan was approved in 1992. Elements of the plan were updated in 1998 to better address emerging issues and needs in bicycling. This plan identifies a planned regional bikeway system which emphasizes on-street facilities. An off-street system plan is under development. The Bicycle Plan includes a bicycle policy statement consisting of four overall goals and numerous objectives. The goals and objectives are designed to provide guidance in planning, designing and implementing a system of internal and regionally connected bikeways that serve the daily travel needs of bicyclists. At the regional level, transportation enhancement funds and Congestion Mitigation and Air Quality Improvement (CMAQ) funds have been applied to bicycle projects, while at the local level, Highway User Revenue Funds (HURF) and general funds are used for bicycle projects.

The Regional Off-Street System (ROSS) Plan was approved in 2001. The ROSS Plan identifies a region-wide system of off-street paths/trails for non-motorized transportation. Throughout the MAG region, numerous opportunities for off-street travel by people who walk and bicycle exist along areas such as canal banks, utility line easements and flood control channels. The goal of the ROSS plan is to help make bicycling and walking viable options for daily travel trips using off-street opportunities.

The ROSS plan provides guidance to MAG member agencies in creating an off-street, non-motorized transportation system. The Plan focuses on potential corridors that form the backbone of a regional off-street system of routes. The ROSS Plan identifies issues associated with paths/trails and non-motorized transportation, identifies corridors which could be used for paths/trails in the MAG region, and provides design guidelines for paths/trails.

PEDESTRIAN

On December 8, 1998, the MAG Regional Council updated the pedestrian plan that was developed in 1993. This revised plan -- *Pedestrian Plan 2000* -- identifies and recommends programs and actions to guide and encourage the development of pedestrian areas and facilities and ultimately to encourage increased walking as a viable mode in the region. It also incorporates a unique approach: flexible design tools (Roadside Performance Guidelines) to assist MAG member agencies in creating better walking environments. The plan revision was overseen by the MAG Pedestrian Working Group with direct input provided by a stakeholders group.

DEMAND AND SYSTEM MANAGEMENT

Transportation Demand Management (TDM) programs and Transportation System Management (TSM) strategies are included as integral parts of the MAG LRTP with specific projects designated for funding in the MAG five-year program. Ongoing TDM efforts include telecommuting, rideshare, and vanpool programs. Ongoing TSM efforts include projects that are making operational improvements through real-time traffic management during congested periods, and infrastructure-based capacity improvements. Capacity improvements include improvements to intersections and interchanges.

Operational TSM improvements are being made through Intelligent Transportation Systems (ITS) projects that include advanced traffic management systems, telecommunication links that enable cross jurisdictional coordination, frequent and accurate traveler information and advisories via radio, television and the internet, and smoother interfaces at arterials-freeway crossings. ITS projects are becoming increasingly important in regional transportation planning efforts. The MAG ITS Committee has completed an update of the region's ITS Strategic Plan. This plan will serve well into the future as the region's road map for the investments in ITS infrastructure that consist of advanced systems and effective management strategies.

HUMAN SERVICES AND SAFETY NEEDS

The transportation needs of special populations is a regional concern. Limitations caused by age or disability complicate securing transportation for a portion of our population. In addition, those who are seeking employment or training and those who have few financial resources find limited transportation options available to reach second shift and weekend employment.

The Long Range Transportation Plan includes federal, state and local funds to provide for transportation services. Among the services provided are:

- Work Links program which seeks to match low-income persons with available transportation resources;
- Wheels-To-Work program that promotes a tax credit for donated cars to be used by cash assistance recipients;
- Elderly and Persons with Disabilities Transportation Program which provides capital assistance funds (van purchases) to non-profit organizations and local jurisdictions who serve the elderly and persons with disabilities;
- The development of an elderly mobility project to address the transportation challenges facing the senior population;
- Local programs such as reduced bus fares, Dial-A-Ride, van and car pools, donated bicycles and various other programs.

Ensuring high levels of safety on the regional transportation system is a primary goal of the region. Safety on the urban freeway system is expected to continue to improve with median barrier installation and the Freeway Service Patrol. There is room for improvement in the area of street and intersection safety. Bicycle and pedestrian plans have addressed safety needs. Crash history figures for the region indicate that between 1994 and 1999 total crashes have increased by 24 percent, while fatal or injury crashes have increased by 9 percent.

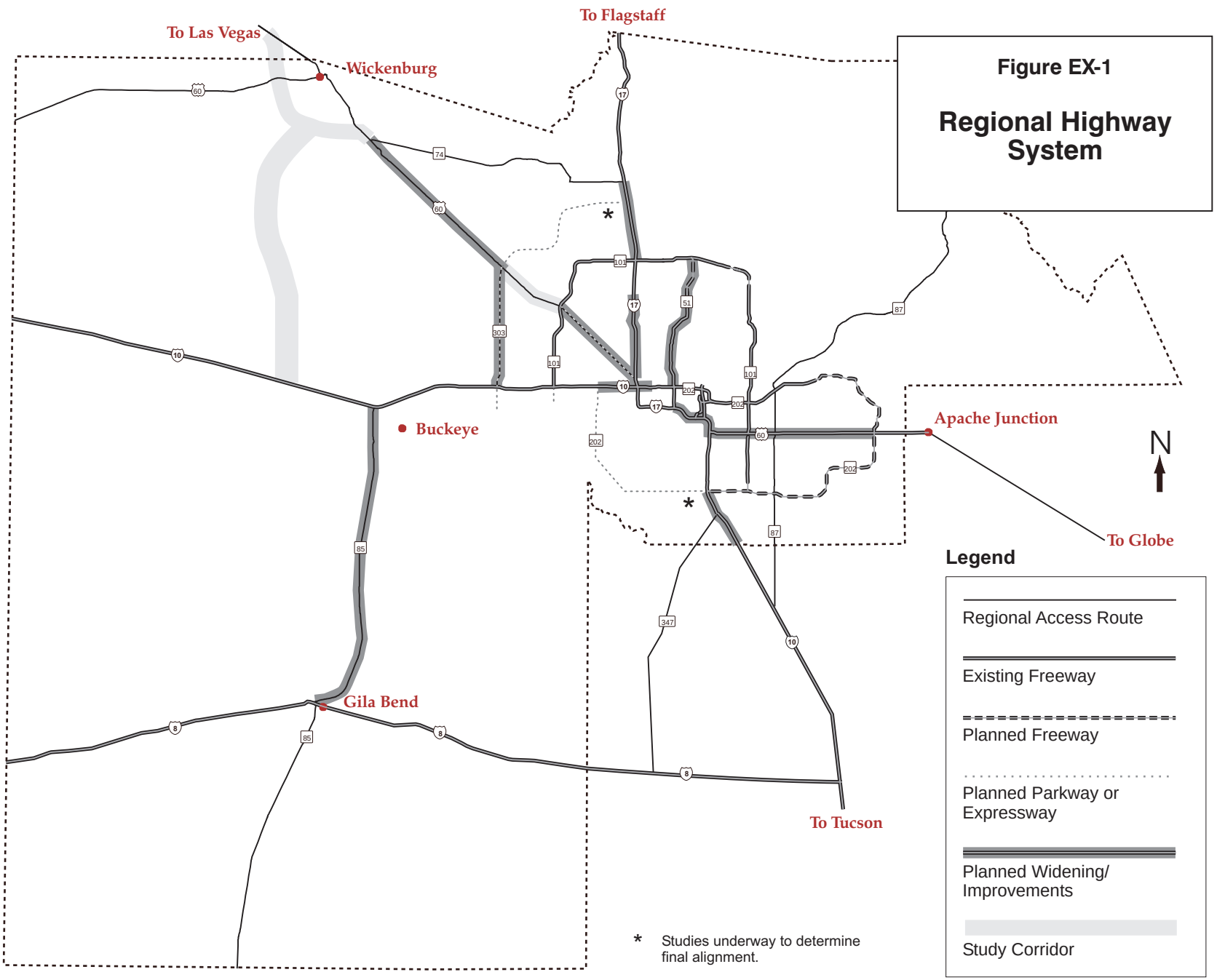


Figure EX-1: Regional Highway System

Regional Highway Projects by 2007

Figure EX-2

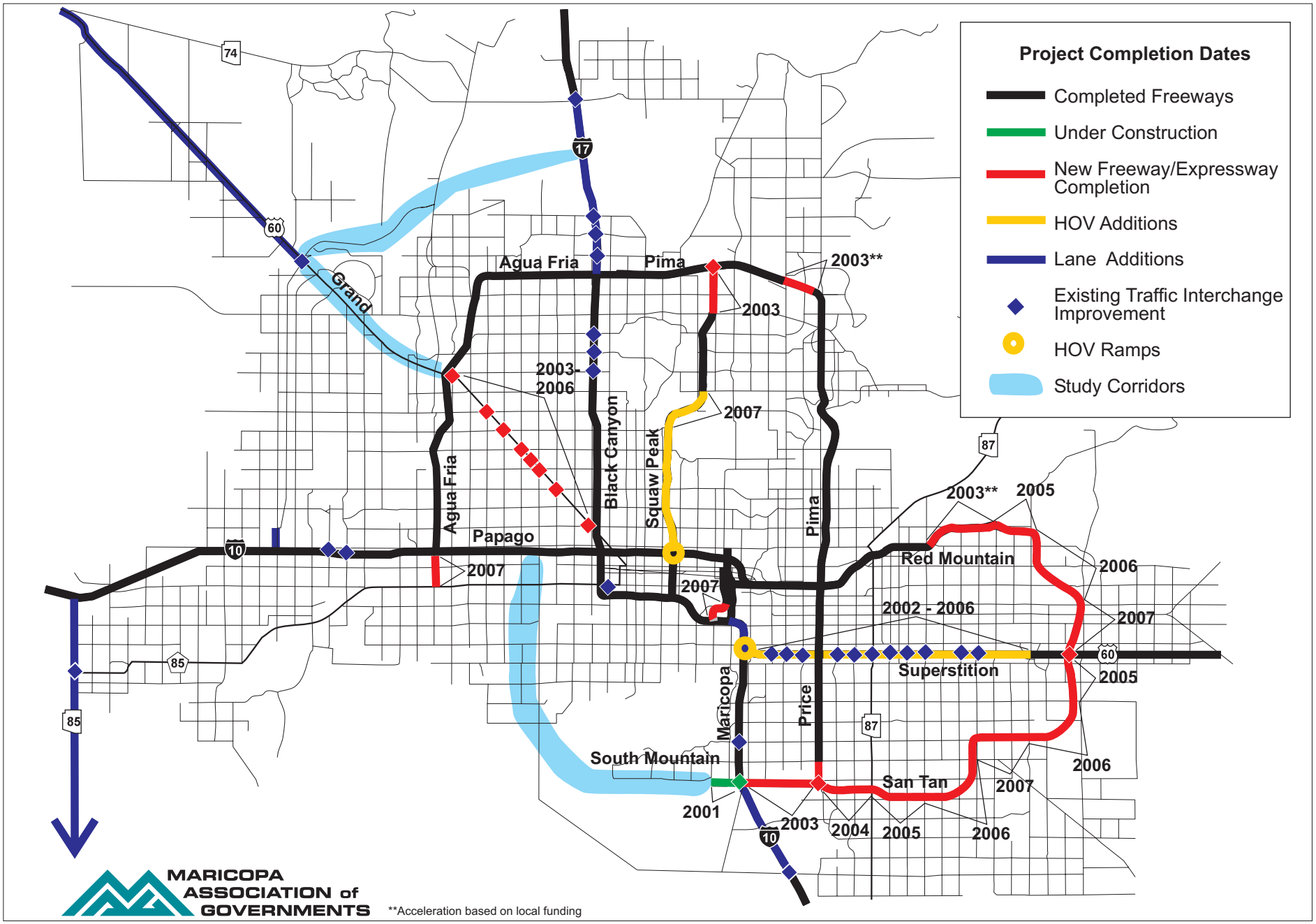
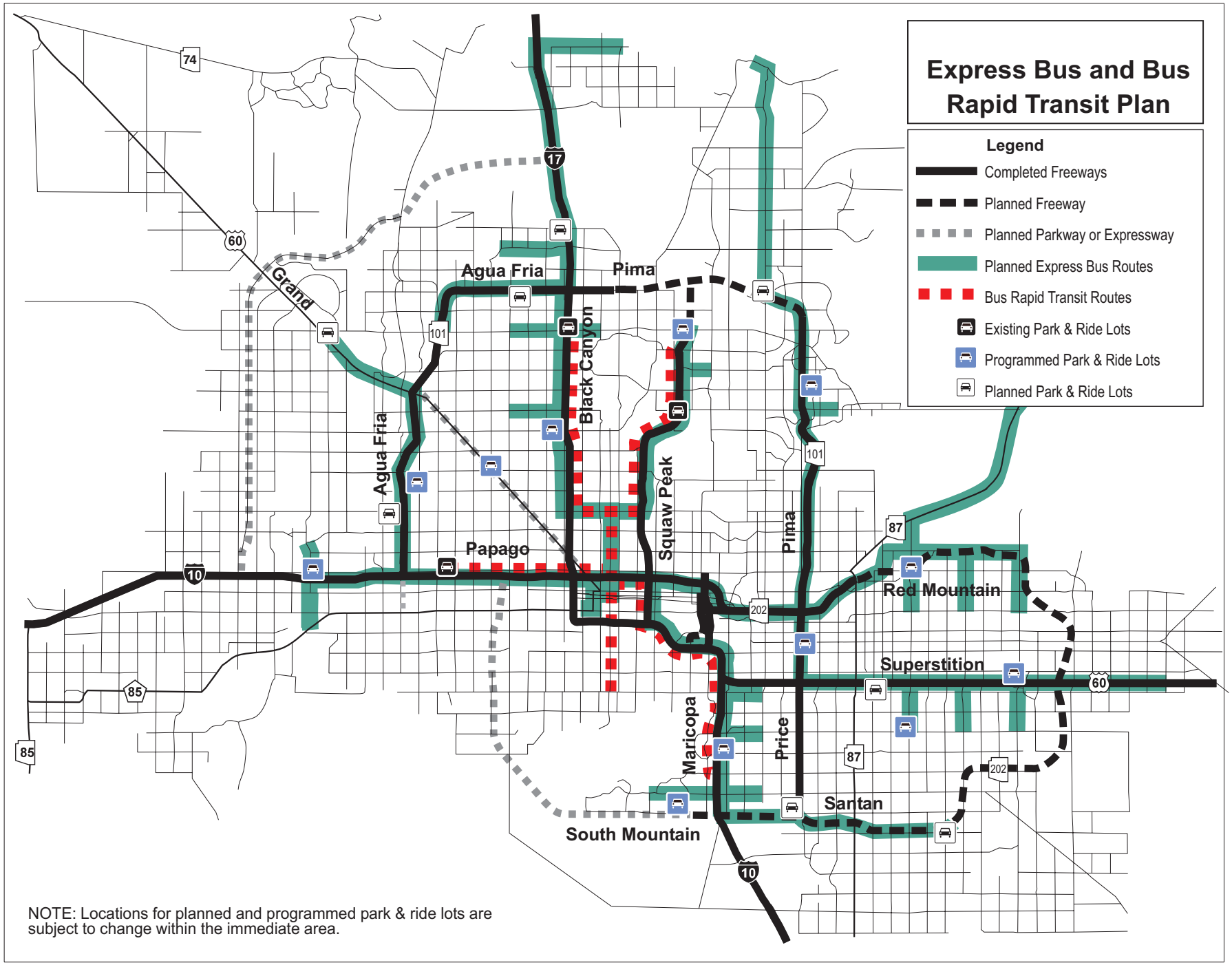
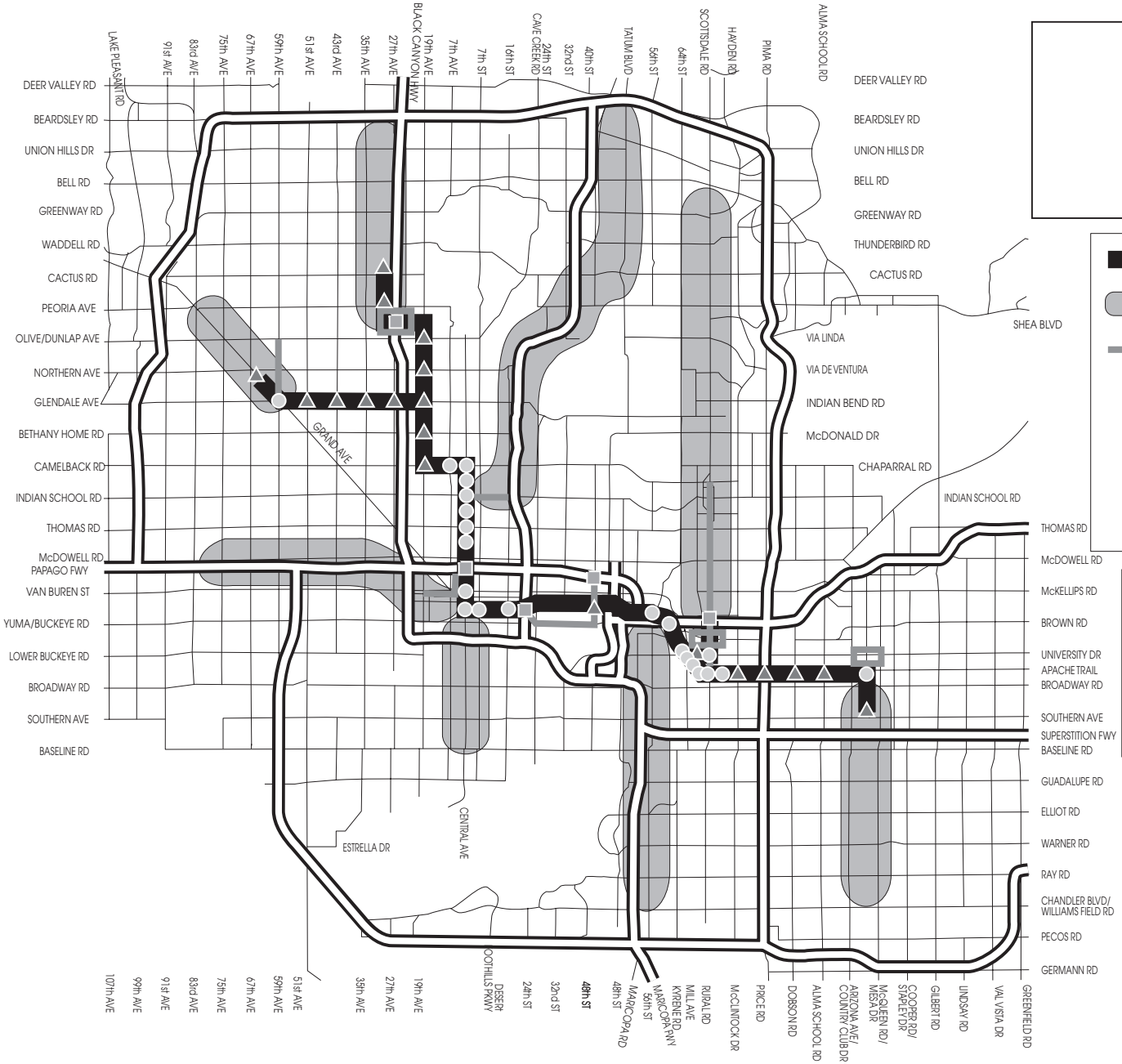


Figure Express Bus and Bus Rapid Transit Plan



NOTE: Locations for planned and programmed park & ride lots are subject to change within the immediate area.


Light Rail Service
Light Rail Line
Potential Corridor Extensions
Circulator Route
Rail Station*
Station with Park and Ride*
Station with Express Bus Terminal
* All rail stations will have local bus connections
Frequency of Service
Peak Off Peak
Central** 5 10
Extension 10 20
** Glendale and 19th Avenues to Mill and 3rd Avenues
DEER VALLEY RD
BEARDSLEY RD
UNION HILLS DR
BELL RD
GREENWAY RD
THUNDERBIRD RD
CACTUS RD
SHEA BLVD
PEORIA AVE
OLIVE/DUNLAP AVE
NORTHERN AVE
GLENDALE AVE
BETHANY HOME RD
CAMELBACK RD
INDIAN SCHOOL RD
THOMAS RD
McDOWELL RD
PAPAGO FWY
VAN BUREN ST
YUMA/BUCKEYE RD
LOWER BUCKEYE RD
BROADWAY RD
SOUTHERN AVE
BASELINE RD
McKELLIPS RD
BROWN RD
UNIVERSITY DR
APACHE TRAIL
SUPERSTITION FWY
GUADALUPE RD
ELLIOT RD
WARNER RD
RAY RD
CHANDLER BLVD/ WILLIAMS FIELD RD
PECOS RD
GERMANN RD
VIA LINDA
VIA DE VENTURA
INDIAN BEND RD
McDONALD DR
CHAPARRAL RD
GRAND AVE
ESTRELLA DR
CENTRAL AVE
LAKE PLEASANT RD
91st AVE
83rd AVE
75th AVE
67th AVE
59th AVE
51st AVE
43rd AVE
35th AVE
27th AVE
BLACK CANYON HWY
19th AVE
7th AVE
7th ST
16th ST
CAVE CREEK RD
24th ST
32nd ST
40th ST
TATUM BLVD
56th ST
64th ST
SCOTTSDALE RD
HAYDEN RD
PIMA RD
ALMA SCHOOL RD
107th AVE
99th AVE
DESERT FOOTHILLS PKWY
48th ST
MARICOPA RD
56th ST
MARICOPA PKWY
KYRENE RD
MILL AVE
RURAL RD
McCLINTOCK DR
PRICE RD
DOBSON RD
ARIZONA AVE/ COUNTRY CLUB DR
McQUEEN RD/ MESA DR
COOPER RD/ STAPLEY DR
GILBERT RD
LINDSAY RD
VAL VISTA DR
GREENFIELD RD

SECTION 1

PLANNING PROCESS

The Maricopa Association of Governments (MAG) Long Range Transportation Plan (LRTP) addresses all modes of transportation through the year 2021. To incorporate recent planning studies and demographic and economic projections, and to ensure consistency with the most recent air quality plans, the LRTP is updated annually if feasible.

This introductory section provides an overview of the MAG organization and the planning process, and includes a discussion of the integration of land use, human services and air quality planning elements in the transportation planning process. Also, new documents supporting this Update are listed.

MAG ORGANIZATION

The Maricopa Association of Governments was formed in 1967 to address regional planning needs. The member agencies of MAG include incorporated cities and towns within Maricopa County, the County, the Gila River Indian Community and the Salt River Pima-Maricopa Indian Community. In transportation, MAG has been designated by the Governor as the Metropolitan Planning Organization in accordance with Federal requirements. Also, MAG is designated as the Regional Air Quality Planning Agency for the region.

The governing body of MAG is the Regional Council, which includes a representative of each member agency and two representatives from the Arizona State Transportation Board. In addition, MAG and the Chairman of the Citizens Transportation Oversight Committee (CTOC) as an ex-officio member on matters relating to the Regional Freeway System.

The MAG Management Committee and four MAG policy committees report directly to the Regional Council. In addition to the policy committees, MAG has 20 technical committees, many of which address transportation issues. The following are the policy and technical committees that address transportation issues:

- Transportation Review Committee
- Aviation Policy Committee
- Enhancement Funds Working Group
- Intelligent Transportation System Committee
- Regional Bicycle Task Force
- Pedestrian Working Group
- Street Committee

PLAN UPDATE PROCESS

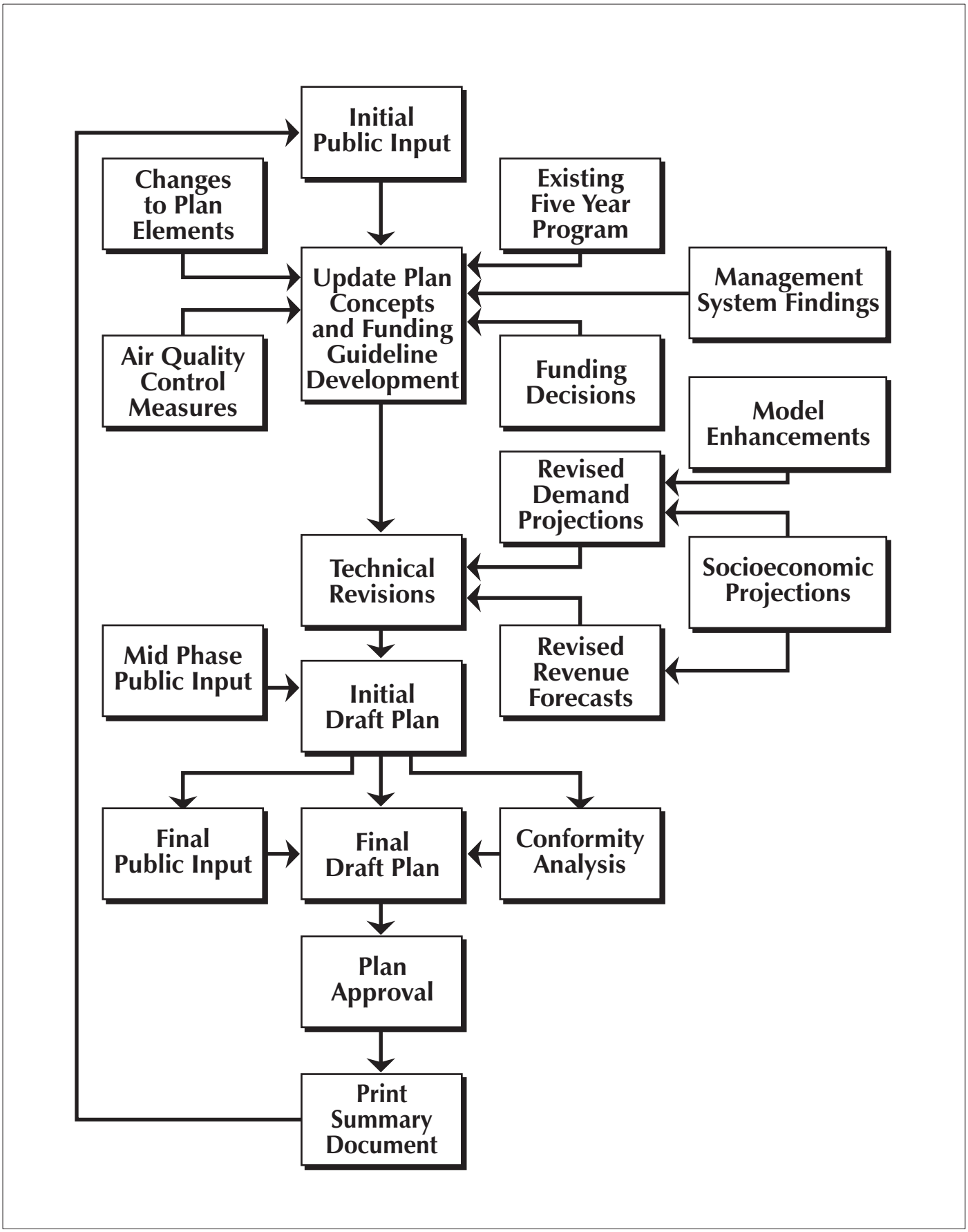
An integrated process was used in FY 2001 to develop the regional five year program. ADOT, MAG and RPTA worked together to develop funding estimates and to select projects. This cooperative process also extends to developing regional and statewide transportation plans. The general process for updating the LRTP at MAG is outlined in Figure 1-1. It begins with public meetings to provide MAG with guidance in developing the Plan, then proceeds with the incorporation of recommended Plan additions and modifications. The process includes development of early guidelines to facilitate project selection. In addition to open houses, the outreach process included targeted outreach to public and private sector transportation stakeholders. Based on input received from the outreach process, guidelines were addressed by the Regional Council for consideration in the process of selecting projects to be federally funded.

The updated Plan integrates the most recent financial, demographic, economic, and travel demand forecasts and is based on the latest model improvements. It also incorporates consideration of the most recent information from the management systems and factors related to Title VI of the Civil Rights Act of 1964 and Executive Order 12898 (Environmental Justice). A draft Plan is prepared for air quality conformity analysis and public comment. The final draft Plan is then submitted to the Regional Council for adoption.

TRANSPORTATION/LAND USE COORDINATION

Transportation and land use coordination is accomplished through several venues. Local communities develop integrated land use and transportation plans. In turn, these land use plans are an important ingredient in developing regional socioeconomic projections. Regional values and policies have also been developed to facilitate the consideration of land use and transportation issues.

Figure 1-1: Plan Update Process for the MAG Long Range Transportation Plan



Socioeconomic Projections. MAG transportation plans are based on the most recently approved socioeconomic projections. This 2001 Plan Update is based on small area socioeconomic projections of population and employment as approved by the Regional Council in June, 1997.

MAG socioeconomic projections are developed using a land use modeling process and extensive local review. Local land use plans are a key factor in developing these projections. The resulting socioeconomic projections are a major input into the MAG transportation models which provide transportation projections and analysis used in developing transportation plans.

Regional Values Statement. In February 1994, the Regional Council adopted a regional values statement to coordinate MAG planning efforts. The statement included sections on environmental and natural resources, land use, human services, education, public safety, mobility, capital investment, economic development, arts and culture, and fiscal matters.

The mobility section of the values statement formalized values that are implicit in the current LRTP and Transportation Improvement Program (TIP). The value statement for the mobility section is identified as, "safe, convenient, and affordable transportation and access throughout the region regardless of age or physical ability."

Regional Planning Process. In March, 1995, the Regional Council adopted Interim Land Use Policies. The purpose of the policies was to provide direction to staff in commenting on the impacts of regional land use decisions. The Interim Land Use policies encourage "development that contributes to regional land use patterns that decrease single occupancy vehicle trips and air pollution in the near future and long term." Additionally, the policies encourage development that supports existing and planned land uses, and does not create new urban and suburban cores outside the urbanized area of the region. Staff will continue to review proposed regional land uses for compatibility with these policies and the Regional Values Statement.

Valley Vision 2025 Committee. Valley Vision 2025 is a public/private partnership initiated by MAG to form a vision of what residents want this region to become in the year 2025. The partnership is an outgrowth of citizen-based recommendations to the MAG Regional Council which call for this region to plan for the future now if it is to remain an attractive and desirable place to live. In March, 1995, the Regional Council formed the Blue Ribbon Committee to recommend a growth planning process for the region. In February, 1997, the Regional Council accepted the Committee's recommendation and by December, 1997 it had formed the Valley Vision 2025 Committee.

The Valley Vision 2025 committee consists of 82 leaders representing a cross section of business, civic and community representatives from throughout the Maricopa County region. The committee guided the visioning effort and was responsible for creating a final vision. The vision addresses nine specific areas including: culture, economy, education, human services,

natural features, public safety/civic infrastructure, public utilities/governance, urban features, and transportation. The Vision includes recommendations for policies and actions that will move the region toward achieving the articulated vision, and identify entities responsible for implementation.

TRANSPORTATION/AIR QUALITY COORDINATION

Transportation and air quality plans are closely coordinated. MAG prepares air quality plans for the region based on the most recent socioeconomic projections and transportation plans. In turn, a conformity analysis is completed prior to approval of transportation plans, programs and projects. As documented in the related reports, this 2001 Update of the LRTP is in conformance with all applicable air quality plans.

TRANSPORTATION/HUMAN SERVICES COORDINATION

MAG is one of the few councils of governments in the nation to incorporate human services planning and transportation planning within the same organization. This strong coordination has led to better planning for the special transportation needs of people who are low income, elderly, who have disabilities, and/or are transitioning from welfare to work. This close relationship has provided opportunities for early and continuing involvement in the planning process of people who are our region's most vulnerable and those in most need of transportation assistance.

Human Services Plan. The annual MAG Human Services Plan for Maricopa County includes documentation on human services needs for adults, families and children; persons who are elderly; persons with disabilities; and persons with developmental disabilities. The human services planning process develops annual recommendations to the Arizona Department of Economic Security on specific uses of a portion of the federal Social Services Block Grant (SSBG). The Human Services Plan is developed through an annual cycle of activities which includes public meetings, regular MAG committee meetings, and meetings with other agencies (state, local general government, and special district) and non profit, community based organizations (such as advocates, service deliverers and planners).

The annual Plan documents population distributions based upon the most current census data and describes target population needs. MAG facilitates community-based forums around special issues, and publishes information which frequently lists resources and sites of available services within the MAG region. The need for transportation has been a high priority since the inception of the human services planning program. A portion of the SSBG funds provide transportation for homeless people, welfare-to-work clients, elderly persons and those with disabilities.

MAG Human Services Coordinating and Technical Committees. The human services planning committees address policy and technical aspects of human services planning. Representatives of the policy level committee are elected officials, board representatives of

United Ways and Community Councils, the Area Agency on Aging and citizen representatives. The technical level committee is composed of staff counterparts to the policymakers.

The MAG Human Services Coordinating and Technical Committees are concerned with the region's public transit and paratransit systems and the transportation needs of vulnerable people in our region. The committees have requested more in-depth analysis of the barriers that the lack of transportation presents to human services clients. Consequently, the issue of inadequate transportation and special transportation for people who are poor, elderly or disabled was the subject of a recently completed special study coordinated between the transportation planning and human services programs at MAG. The Special Transportation Needs Study includes a number of measures to address the needs of these populations and results are summarized in Section 13.

2001 PLAN UPDATE

This Update of the MAG Long Range Transportation Plan summarizes information regarding previous planning documents and highlights new planning documents developed as part of the 2001 Update. Specific new documents developed as part of the 2001 process to update the MAG Long Range Transportation Plan include the following:

- *Annual Report on the MAG Freeway & Expressway Plan, February 2001*
- *Conformity Analysis*
- *Conformity Analysis Appendices*
- *MAG Transportation Management Systems, FY 2001 Update*
- *FY 2002-2006 MAG Transportation Improvement Program*
- *MAG FY 2001 Early Input Opportunity Report*
- *MAG FY 2001 Mid-Phase Opportunity Report*
- *MAG FY 2001 Final Phase Opportunity Report*
- *Grand Avenue Major Investment Study*
- *FY 2001-2005 Annual Short Range Transit Report*
- *Regional Off Street System (ROSS) Plan*
- *Regional Freeway System - Life Cycle Certification*
- *Loop 303 Connection Study*

SECTION 2

PLAN DOCUMENTATION

The MAG Long Range Transportation Plan (LRTP) is a composite of numerous documents and the policy actions taken by the Regional Council. The following section provides an overview of the entire Plan by presenting the principal documents that comprise the LRTP.

OVERALL PLAN

Cross modal documents developed in relation to this year's Update of the MAG LRTP include the following:

MAG 2002-2006 Transportation Improvement Program (Maricopa Association of Governments, *July, 2001*). A five-year program of surface transportation improvements.

2001 MAG Conformity Analysis of the MAG Long Range Transportation Plan Summary and 2001 Update and the MAG FY 2002-2006 Transportation Improvement Program (Maricopa Association of Governments, 2001). Contains an air quality conformity analysis of the Long Range Transportation Plan and five-year Transportation Improvement Program (TIP).

MAG Process for Public Involvement in Transportation Planning (Maricopa Associations of Governments, September, 1994). A periodic process for receiving public input, comment and suggestions on transportation planning and programming in the MAG region.

MAG FY 2001 Early Phase Input Opportunity Report, October 2000 (Maricopa Association of Governments, November, 2000). Contains a summary of public comments and input received during the early phase public meetings concerning the LRTP and TIP.

MAG FY 2001 Mid-Phase Input Opportunity Report (Maricopa Association of Governments, 2001). Contains a summary of public comments and input received during the mid phase public meetings concerning the LRTP and TIP.

MAG FY 2001 Final Phase Input Opportunity Report (Maricopa Association of Governments, 2001). Contains a summary of public comments and input received during the final phase public meetings concerning the LRTP and TIP.

MAG Transportation Management Systems Report, *Fiscal Year 2001 Update* (Maricopa Association of Governments, July, 2000). An annual report on the status of the transportation management systems.

Value Lane Study (Arizona Department of Transportation and Maricopa Association of Governments, 2001). Updates the ADOT/MAG High Occupancy Vehicle (HOV) plan and provides recommendations for utilizing excess HOV lane capacity for Single Occupant Vehicle tollways.

Other multimodal reports that comprise the LRTP are documented below. These include reports related to the 7 factors that are required to be addressed by the Transportation Equity Act for the 21st Century (TEA-21).

Valley Vision 2025 Alternatives, Choices, Solutions Vision Report (Maricopa Association of Governments, February, 2000). Develops an overall vision for the Valley including transportation.

MAG Congestion Management System (Maricopa Association of Governments, September, 1994). A report documenting the MAG Congestion Management System (CMS). The MAG CMS is a decision support tool which identifies strategies and policies for managing congestion in the metropolitan area. Technical changes were incorporated into the CMS in 1998.

MAG Transportation Finance Options Study (Maricopa Association of Governments, April, 1994). This study was performed to assist policy-makers in the formulation of a financing program sufficient to fund all capital improvements and ongoing programs contained in the MAG LRTP.

MAG Long Range Transportation Plan Summary and 2000 Update (Maricopa Association of Governments, June, 2000). Contains a 2000 summary and Update of the LRTP.

MAG Long Range Transportation Plan Summary and 1999 Update (Maricopa Association of Governments, June, 1999). Contains a 1999 summary and Update of the LRTP.

MAG Long Range Transportation Plan Summary and 1997 Update with 1998 Addendum (Maricopa Association of Governments, September, 1998). Contains a 1997 summary and Update of the LRTP and includes a 1998 Addendum as of September 1998.

MAG Long Range Transportation Plan Summary and 1997 Update (Maricopa Association of Governments, September, 1997). Contains a summary and Update of the LRTP as of September, 1997.

MAG Long Range Transportation Plan Summary and 1996 Update (Maricopa Association of Governments, September, 1996). Contains a summary and Update of the LRTP as of September, 1996.
MAG Long Range Transportation Plan Summary and 1995 Update (Maricopa Association of Governments, January, 1996). Contains a summary and Update of the LRTP as of January, 1995.

MAG Long Range Transportation Plan and 1994 Update (Maricopa Association of Governments, July 1994). Contains a summary and Update of the LRTP as of July, 1994.

MAG Long Range Transportation Plan: Summary and 1993 Update (Maricopa Association of Governments, July, 1993). Contains a summary and Update for the MAG LRTP.

Special Transportation Needs Study (Maricopa Association of Governments, March, 1999). A study to assess the transportation needs of the mobility-limited population and low-income workers and to identify actions that will improve mobility for these target populations.

Environmental and Energy Considerations (Maricopa Association of Governments, July, 1993). A support document for the MAG LRTP 1993 Update addressing environmental and energy factors.

Demographic, Economic, and Land Use Considerations (Maricopa Association of Governments, July, 1993). A support document for the MAG LRTP 1993 Update. This document addresses socioeconomic factors required by ISTEA.

Intermodal Facilities and Goods Movement (Maricopa Association of Governments, July, 1993). Support documentation for the MAG LRTP 1993 Update which inventories and analyzes intermodal terminals and goods movement.

Intermodal Management System for the Metropolitan Phoenix Area (Maricopa Association of Governments, 1995). Analyzes the connections between all transportation modes used by persons traveling or commodities being shipped. Stresses the enhancement of intermodal choices, connections and coordination.

Supplemental Highway Considerations (Maricopa Association of Governments, 1993). A technical support document for the 1993 Plan Update that addresses special highway considerations.

Supplemental Transit Considerations (Maricopa Association of Governments, 1993). A technical support document for the 1993 Update of the MAG LRTP that addresses special transit issues.

AIRPORTS

The airport element of the Plan is documented in the following reports:

MAG Regional Aviation System Plan (RASP) Implementation Study (Maricopa Association of Governments, December, 1996). Facilitates the implementation of the MAG RASP by preparing an aviation database and airport sketches for the MAG system airports, consolidating the airport capital improvement program and general priorities, examining the intermodal access to airports, and displaying noise contours and land use compatibility.

Regional Aviation System Plan, Phase II (Maricopa Association of Governments, 1993). Evaluated the airspace usage, environmental impacts, access convenience, aviation demand accommodation, facility costs and financial feasibility, and the economic impacts associated with the alternatives identified in Phase I as modified in Phase II. In addition, a strategic implementation plan was prepared to implement the study recommendations.

MAG Regional Aviation System Plan, Phase I (Maricopa Association of Governments, 1991). Included an inventory, forecasts, demand/capacity analysis and alternatives for meeting future demand.

BICYCLES

The key bicycle planning documents are:

Regional Bicycle Plan: 1999 Update (Maricopa Association of Governments, March, 1999). Provides an update to the MAG Regional Bicycle Plan as of March, 1999.

Regional Bicycle Plan (Maricopa Association of Governments, 1992). Provides a Bicycle Plan for the MAG region.

Bikeways in the Metropolitan Phoenix Area (Maricopa Association of Governments, 1997). A map that shows a composite system of existing, locally designated bicycle facilities.

DEMAND MANAGEMENT

The key planning documents for the demand management element of the Plan include:

Maricopa County Trip Reduction Program, Final Report 1998 (Maricopa County, Summer, 1998). A report to the Arizona Department of Environmental Quality on the performance of the Maricopa County Trip Reduction program for fiscal year 1998.

1998 Clean Air Campaign and Travel Reduction Program Survey (Regional Public Transportation Authority, Spring, 1996). A survey conducted to assess participation in and reactions to the Trip Reduction and Clean Air Campaign program.

ITS Strategic Plan; The Early Deployment of Intelligent Transportation Systems (ITS) in Maricopa County (Maricopa County Department of Transportation, October, 1995). Identifies a set of incremental projects to achieve the required ITS services and recommended system architecture.

Supplemental Report on MAG Recommendations for the Maricopa County Travel Reduction Program (Maricopa Association of Governments, 1992). Develops travel reduction goals for the MAG area.

Regional Planning Report (Maricopa Association of Governments, 1991). A section in this report titled, "Regional Rideshare Program Promotes Commuting Alternatives," describes the Regional Ridesharing Program.

FREEWAYS

Key freeway planning documents include:

Annual Report On The MAG Freeway & Expressway Program (Maricopa Association of Governments Fiscal Analysis Unit, 2000). Provides a summary of the fiscal status of the MAG Freeway Program and progress made over the past year.

Regional Freeway System Life-Cycle Certification (Arizona Department of Transportation, January 2000). Presents estimated costs and funds for new freeways.

Grand Avenue Major Investment Study (Arizona Department of Transportation, September, 2000). Presents a development concept for Grand Avenue that provides for alternating grade separation of major cross streets while preserving the option for upgrading the facility to a full expressway.

Grand Avenue Corridor Study (Maricopa Association of Governments, May, 1998). A study to address the congestion resulting from six-legged intersections along the corridor and develop options for consideration which would result in a more modern transportation corridor.

Major Investment Studies For The Squaw Peak and Superstition Corridors (Maricopa Association of Governments, September, 1996). A study to identify problems and analyze solutions to recommend preferred transportation projects in the Superstition and Squaw Peak corridor areas.

Major Investment Studies For The Red Mountain and Santan Corridors (Maricopa Association of Governments, September, 1996). A study to identify problems and analyze solutions to recommend preferred transportation projects in the Red Mountain and Santan corridor areas.

High Occupancy Vehicle Facilities Policy Guidelines and Plan for the MAG Freeway System (Maricopa Association of Governments, 1994). Develops policies and a plan for High Occupancy Vehicle (HOV) facilities on MAG freeways.

MAG Transportation Plan Update (Maricopa Association of Governments, 1991). Updates the long range freeway and transit plans.

I-17 System Design/Operations Study (Arizona Department of Transportation, 1990). Defines the ultimate plan for I-17 from Papago/Maricopa Freeway Interchange northward to Deer Valley Road.

MAG Freeway/Expressway Plan Update: Revenue Sources Analysis (Maricopa Association of Governments, 1990). Investigates potential revenue sources for funding transportation projects.

MAG Freeway/Expressway Plan Update: Priority Treatment for High Occupancy Vehicles (Maricopa Association of Governments, 1990). Analyzes alternative freeway related HOV improvements.

MAG Freeway/Expressway Plan (Maricopa Association of Governments, 1987). Provides a description of the MAG Freeway Plan.

I-10 Corridor Refinement Study: 16th Street/Buckeye Road to Baseline Road (Arizona Department of Transportation, May 1988). Develops a rehabilitation plan to correct deficiencies and accommodate future traffic requirements, including a collector-distributor concept, in the corridor.

I-17/I-10 Corridor Study (Arizona Department of Transportation, 1986). Develops a plan for improving I-17 and I-10.

PEDESTRIANS

A plan document for pedestrian facilities was completed in 1995:

Pedestrian Plan 2000 Final Report (Maricopa Association of Governments, December 1999). Develop a pedestrian facilities plan for the MAG region.

MAG Pedestrian Area Policies and Design Guidelines (Maricopa Association of Governments, 1995). Develops policies and design guidelines for pedestrian facilities.

STREETS

The street plan is defined by current model networks and is usually updated every two years. In 1995 and 1996, a street plan was updated which included a financial element and a study of the Roads of Regional Significance concept. Key documents related to the street element include:

Roads of Regional Significance Evaluation (Maricopa Association of Governments, 1996). Refines the Roads of Regional Significance concept for the MAG area.

MAG Regional Street Financial Plan (Maricopa Association of Governments, 1995). Develops a financial plan for streets in the MAG region.

MAG Freeway/Expressway Plan Update, New Corridors Study (Maricopa Association of Governments, 1990). Evaluates new freeway corridors, Roads of Regional Significance, and capacity increases to existing and planned freeways.

TRANSIT

The key transit planning documents are listed below:

Long Range Transit Plan (Regional Public Transportation Authority, June, 1999). This document lays out the long range transit plan for the region.

MAG Fixed Guideway System Study (Maricopa Association of Governments, January 1999). An analysis of fixed guideway system options of the Phoenix metropolitan area, including alternative corridors and technology evaluation.

Major Investment Study Report, Regional Transportation System Corridor Studies, Central Phoenix/East Valley (City of Phoenix Public Transit Department, May 6, 1998). Identifies transportation improvements designed to reduce existing and future traffic congestion, improve mobility options, and provide transportation alternatives in the corridor linking central Phoenix with the cities of Tempe and Mesa.

Major Investment Study Report, Regional Transportation System Corridor Studies, Phoenix/Glendale (City of Phoenix Public Transit Department, November 1998). Identifies high capacity transportation investments to improve mobility and provide transit options in the corridors linking Metrocenter and downtown Glendale with Central Phoenix.

FY 2000-2004 Regional Short Range Transit Plan (Regional Public Transportation Authority, January 2000). A five year program of transit services for the MAG area.

Regional Transit Plan for Maricopa County (Regional Public Transportation Authority, 1991). This plan focuses on developing the bus and dial-a-ride system. The Plan was developed by the Regional Transit Citizen Advisory Committee.

Americans with Disabilities Act Joint Complimentary Paratransit Plan (Regional Public Transportation Authority, 1992). This Plan describes a joint planning effort to provide coordinated complementary paratransit service in the area of Maricopa County served by fixed route bus service.

Transit System Starter Corridor Designation, ISTEA II Proforma Recommendation (Maricopa Association of Governments, January, 1997). The report provides an analysis and location of a proposed Starter Corridor for a Fixed Guideway Transit System in the MAG region.

American Disabilities Act Complementary Paratransit Plan (Regional Public Transportation Authority, June 1992). A plan for dial-a-ride services in the MAG region.

SECTION 3

PUBLIC INVOLVEMENT

INTRODUCTION

The Transportation Equity Act for the 21st Century (TEA-21) continues to emphasize public involvement in the metropolitan transportation planning process. The intent of the public involvement provisions in TEA-21 is to increase public awareness and involvement in transportation planning and programming. TEA-21 requires that the metropolitan planning organization work cooperatively with the state department of transportation and the regional transit operator to provide citizens, affected public agencies, representatives of transportation agency employees, freight shippers, private providers of transportation, representatives of users of public transit, and other interested parties a reasonable opportunity to comment on proposed transportation plans and programs.

In September 1993, the Maricopa Association of Governments (MAG) Regional Council adopted a public involvement process for receiving public opinion, comments and suggestions on transportation planning and programming in the MAG region – which is in accord with TEA-21 requirements. This process provides complete information on transportation plans, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement in the planning process. The MAG Process for Public Involvement in Transportation Planning is described in this section, along with its application in the 2001 Update.

ADOPTED PUBLIC INVOLVEMENT PROCESS

The public involvement process is divided into four phases: early phase, mid-phase, final phase and continuous involvement. The early phase meetings ensure early involvement of the public in the development of these plans and programs. The mid-phase process provides for input on initial plan analysis for the Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) and includes a public hearing on regional transportation issues, while the final phase provides an opportunity for final comment on the LRTP, TIP and Air Quality Conformity Analysis. In addition, continuous outreach is conducted throughout the annual update process and includes activities such as presentations to community and civic groups, distributing press releases and newsletters, and working with the Citizens Transportation Oversight Committee (CTOC). All of the comments received through MAG's public involvement process are summarized and provided to the Regional Council, Arizona Department of Transportation (ADOT), and Regional Public Transportation Authority (RPTA) in the form of input opportunity reports.

The early phase is generally conducted from June through October, the mid phase in February, and the final phase late in the summer. There are many ways in which MAG obtains input during these phases from small group presentations to open houses to large community events. In addition, continuous outreach is conducted throughout the annual update process and includes activities such as:

- **Coordination with the Citizens Transportation Oversight Committee.** In 1994, the Citizens Transportation Oversight Committee (CTOC) was created by statute to review and advise the Governor, MAG and ADOT on regional freeway issues. MAG closely coordinates with the CTOC by attending committee and subcommittee meetings, providing information and staff presentations, and maintaining ongoing communication regarding various transportation issues. CTOC representatives have been regularly attending MAG committee meetings, and in 1996, MAG expanded membership of the Regional Council to include the Chairman of CTOC as an ex-officio member on matters relating to the Regional Freeway System. Providing CTOC membership on the Regional Council provides citizen representation and eases citizen involvement on important matters relating to the MAG freeway plan.

- **Public Presentations to Groups.** MAG staff will provide speakers upon request to make presentations to community and civic groups, within the limits of available resources.

- **Traditionally Underserved Populations.** Through the RPTA and the MAG Elderly and Persons With Disabilities Transportation Program Ad Hoc Committee, the needs of elderly and people with disabilities are addressed under the Regional Complementary Paratransit Plan. In addition, MAG seeks and considers the needs of those traditionally underserved by existing transportation systems by collaborating with the human services planning staff at MAG that plans for services for low-income, elderly and disabled populations. MAG transportation plans and programs submitted to the Human Services Coordinating Committee for review. Additionally, MAG provides multimodal transportation information for review and comment to the Human Services planning process.

- **Open Meetings.** MAG conducts meetings in accord with open meeting laws. Meetings of technical committees, working groups, the Management Committee and the Regional Council are open to the public.

- **Regional Council Comment Period.** Fifteen minutes at the beginning of each MAG Regional Council meeting are reserved for public comment. This amount of time can be expanded at the discretion of the chairman.

- **MAG Home Page on the Internet.** A MAG Home Page on the internet lists information about member agencies, existing committees, planning activities, recent accomplishments, and information resource contacts. The internet address of the MAG Home Page is *www.mag.maricopa.gov.*

- **Newsletters.** Newsletters report information of general interest on events and programs at MAG, as well as on specific items such as the LRTP and the TIP.

- **Press Releases.** Press releases are prepared and distributed to local media in conjunction with periodic news events.

- **Meeting Notices and Advertisements in Principal Newspapers.** When financially feasible, all of the formal public hearings and public involvement opportunities are announced with display advertisements in the largest circulation newspaper and in minority-oriented newspapers. Where appropriate, information is provided in a bilingual format. Meeting notices for the LRTP and the TIP are sent out 30 days in advance.

- **Direct Mailing.** MAG maintains a current mailing list that includes interested citizens, affected public agencies, representatives of transportation agency employees, private providers of transportation, advocates for low income and minority interests and representatives of community groups with an interest in transportation. This mailing list is used to announce meetings, distribute newsletters and for other opportunities for public involvement. Interested individuals are added to the mailing list upon request.

- **Staff Contacts.** The name of an appropriate staff contact is published in the LRTP, the TIP and other transportation documents.

Several other MAG activities are available to the public as well. Before the completion of plans and programs, draft documents are available to the public for review and comment so that public concerns can be considered and reflected in the final documents. Upon completion, draft studies, plans, programs and reports are presented to the Management Committee and Regional Council for review and action and are available for public review. Historical reference files of all documents are maintained and these reports are also available for public review.

MAG has a diverse committee structure that involves technical professionals, administrative personnel, elected officials, business interests and citizen volunteers, representing every jurisdiction and many professions and interest groups. The meetings of the committees follow the policy described above under “Open Meetings.”

PUBLIC OUTREACH PROCESS ENHANCEMENTS

In July 1998, the Regional Council recommended that the process for programming federal transportation funds be enhanced. These enhancements include a more proactive community outreach process and the development of early guidelines to help select transportation projects within resource limits. The proactive community outreach process led to an enhanced public involvement process beginning with the FY 1999 Public Involvement Program. The enhanced public involvement process involves transportation stakeholders as outlined in TEA-21 and includes input from Title VI and Environmental Justice (EJ) stakeholders (minority and low income populations). The input received during the enhanced input opportunity has been incorporated in the development of early guidelines to guide project selection for the TIP and LRTP.

The passage of TEA-21 prompted additional changes in planning and programming responsibilities. As a result, ADOT hosted a meeting of regional planning organizations to suggest changes that would benefit the planning and programming process throughout Arizona. The meeting was held in Casa Grande in April 1999 and attended by representatives of metropolitan planning organizations, councils of governments, the Arizona Department of Transportation and Valley Metro. All participants agreed to several guiding principles to help develop and integrate state and regional transportation plans and programs. In the past, development of the MAG LRTP, MAG TIP and the Statewide Transportation Plan and Programs has been on different schedules, which was confusing to members of the public. With changes included in the guiding principles adopted at the April meeting, the two planning and programming processes have been combined.

FY 2001 PUBLIC INVOLVEMENT PROGRAM

The FY 2001 public involvement program is based on the adopted MAG Process for Public Involvement in Transportation Planning outlined in the previous section and as shown in Figure 3-1. The 2001 Program is a combined process to solicit input on the FY 2001 LRTP and FY 2002-2006 TIP Updates. This public involvement process allows discussion of upcoming decisions that are likely to be included in the 2001 Plan and Program Updates. ADOT and RPTA participate in many of these key elements. A description of each phase of the update process follows. However, several enhancements to the adopted process are also included in the FY 2001 public involvement program.

MAG has developed a Title VI and Environmental Justice Public Involvement Plan to achieve a number of defined communication and agency objectives, with the specific purpose of ensuring the full and fair participation in transportation and other agency decision making by all citizens, regardless of race, color, national origin, religion, age, gender, handicap or socioeconomic status. The purpose of the plan is to uphold the principles set forth in Title VI of the Civil Rights Act of 1964 as well as those contained in presidential Executive Order

12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 1994.

To this end, MAG has hired three associates to build a network of citizens, business owners, political leaders and mass media, within Title VI and EJ communities, with which MAG will maintain a working relationship. This network will enable MAG to create a "feedback loop" so that it not only receives information from the target communities, but is able to provide information on how the input is being incorporated into its transportation plans and programs. In addition, MAG has begun to translate documents into languages other than English.

FY 2001 EARLY PHASE INPUT OPPORTUNITY

The early phase input opportunity was conducted over the period of June through October, 2000. During this phase, public input was used to identify and address upcoming issues and work topics to address in the next update of transportation plans and programs. Several forums were conducted during this first phase including open houses, small group presentations, e-mail and telephone correspondence.

Regional Transportation Stakeholders Meeting

The FY 2001 early phase process began with a Regional Transportation Stakeholders Meeting on August1, 2000. The meeting was well attended by community interest group representatives, ADOT district engineer staff, staff from RPTA, and MAG staff. The meeting provided an opportunity for stakeholders to give ideas and suggestions on transportation needs to consider for state and federal funding, including potential funding emphasis areas. An ongoing policy discussion was initiated between ADOT, MAG and RPTA to discuss regional funding allocations and priorities. While the policy discussion was occurring, additional input from transportation stakeholders was solicited through extended public comment periods at MAG committee meetings, open houses, and targeted stakeholder outreach.

Open Houses

To obtain additional early phase input, two open houses were held in the month of September at the MAG offices. The first was held on September 18, 2000 from 11:00 a.m. to 2:00 p.m. The second was held on September 21, 2000 from 4:00 p.m. to 6:00 p.m. The public was informed of the open houses with display advertisements, brochure distribution and a press release was faxed to print and broadcast media.

Extended Public Comment Periods at MAG Transportation Committee Meetings

During the month of September, all MAG transportation committee meetings scheduled extended public comment periods. All meetings were held at the MAG offices in downtown

Phoenix. The following committees offered extended public comment periods: Air Quality Technical Advisory Committee, Intelligent Transportation Systems Committee, Pedestrian Working Group and Regional Bicycle Task Force Joint Meeting, Street Committee, Telecommunications Advisory Group, Transportation Review Committee and Regional Council Transportation Subcommittee.

Stakeholder Outreach

MAG staff made a presentation to the Arizona Bridge to Independent Living (ABIL) and facilitated a meeting for the Southwest Transit Assessment and Review Team (START), in order to gather input on transportation planning issues and funding priorities. The meeting at ABIL was held on October 6, 2000. The facilitated meeting at START was held on August 25, 2000. MAG also scheduled future small group presentations with the Arizona Hispanic Chamber of Commerce and Maricopa County Community Colleges.

FY 2001 MID PHASE INPUT OPPORTUNITY

During the mid-phase, which was conducted in February 2001, opportunities were provided to obtain input on initial plan analysis in the LRTP and transportation projects in the TIP. The FY 2001 mid phase process began with a "MAG at the Mall" event on February 10th and 11th. Information on the various MAG sponsored transportation programs was presented and MAG staff will be on hand to answer questions and receive input. A transportation fair will be held on February 20th. At the fair, informational boards of various aspects of transportation will be displayed, and staff from MAG, the Arizona Department of Transportation, and the Regional Public Transportation Authority will be available to answer questions and receive input. In addition, public input will be sought on all elements of the draft LRTP and TIP.

FY 2001 FINAL PHASE INPUT OPPORTUNITY

A public hearing was held in July 3, 2001 during the final phase. In accordance with federal regulations, a public hearing on the conformity analysis, the LRTP and the TIP is required before the adoption of these plans and programs. Formal comments received during the comment period were summarized and provided to the Management Committee, the Regional Council and interested citizens. After the public hearing, the Regional Council took action to approve the finding of conformity for the FY 2001 Update of the LRTP and the FY 2002-2006 TIP.

CONTINUOUS INVOLVEMENT

As part of the continuous outreach process, MAG staff has presented information on transportation planning and programming to a number of committees, groups, and the media. These activities include:

? Continued participation in the public involvement process of Valley Connections, a study examining light rail in the Valley.
? Gave presentations and attended meetings of the Governor's Transportation Vision 21 Task Force.
? Gave presentations and attended meetings of the Citizens Transportation Oversight Committee.
? Continued MAG membership and involvement -- including presentations on transportation planning and programming -- with several civic organizations in the region including the Phoenix Chamber of Commerce and Valley Forward.
? Consideration of input received by the MAG Human Services Planning Program in its public outreach process, and integrating with this input process when feasible.

Additional outreach activities include updating the MAG Web site at http://www.mag.maricopa.gov. The site provides information on MAG committees and issues of regional importance, as well as access to electronic documents and links to member agencies. Visitors to the site may also send comments or questions via e-mail to mag@mag.maricopa.gov. In addition, each quarter, MAG distributes a newsletter, *MAGAZine*, addressing the issues and concerns of the cities, towns and tribal communities of Maricopa County. Ongoing coordination with RPTA, ADOT and CTOC have also led to refinements in the public involvement process.

SECTION 4

PLAN ANALYSIS

This section summarizes how the 2001 Update of the MAG Long Range Transportation Plan (LRTP) is analyzed. Elements considered include planning factors, Title VI of the Civil Rights Act of 1964, planning models, transportation management systems and systems performance indicators.

PLANNING FACTORS

In developing the LRTP, MAG considers seven factors which are mandated by Transportation Equity Act for the 21st Century (TEA-21). These factors include the following items:

- support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- increase the safety and security of the transportation system for motorized and nonmotorized users;
- increase the accessibility and mobility options available to people and for freight;
- protect and enhance the environment, promote energy conservation, and improve quality of life;
- enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- promote efficient system management and operation; and;
- emphasize the preservation of the existing transportation system.

In Appendix B, each of the above factors is discussed separately, and each Plan element or document that addresses the corresponding factor is identified. General discussion regarding how the factors are considered throughout the planning process is included as well.

TITLE VI Environmental Justice

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color and national origin by recipients and sub-recipients of federal funds and prohibits exclusion from participation in, denial of benefits, or being subjected to discrimination under any program or activity receiving federal financial assistance. Additional federal and state laws and directives prohibit discrimination on the basis of religion, age, gender, handicap or disability. The Act and its related laws and directives hereinafter will be referred to collectively as Title VI. In 1994 Executive Order 12898 directed every Federal agency to make environmental justice (EJ) part of its mission by identifying and addressing the effects of all programs, policies and activities on minority and low-income populations.

MAG, as the designated Metropolitan Planning Organization (MPO) in the region, is a recipient and sub-recipient of federal funds. Acceptance of federal funds requires that MAG address the federal laws and directives relating to nondiscrimination in our planning and programming processes.

MAG employs several methods to comply with Title VI and EJ issues in its transportation planning and programming processes. As the regional planning entity, MAG collects socioeconomic data. Data on race, gender, age, income status, ethnicity, disability and income are incorporated in the MAG Human Services Plan for Maricopa County and the MAG Transportation Management Systems Report.

The MAG Human Services Planning Program assesses the priority needs of local minority populations and people in underserved communities. The processes, findings and recommendations of the Program are included in the annual *MAG Human Services Plan for Maricopa County*, and are integrated into the transportation planning program.

The MAG Transportation Management Systems Report is prepared as a guide for selecting projects to be included in the annual update of the MAG Transportation Improvement Program (TIP). The report includes socioeconomic data to guide decision making, and is offered for local consideration when proposing projects for inclusion in the TIP.

Additional efforts to comply with Title VI and EJ include:

- MAG staff attendance at federal and state training courses related to Title VI and EJ.
- Consideration of the seven factors required by TEA-21.
- Gathering and inclusion of demographic information about protected populations for the *MAG Urban Atlas*.

- Enhanced MAG public participation process to insure input of populations specifically mentioned by Title VI and EJ in the transportation plans and programs.

- Conducting on-board origin and destination surveys to identify characteristics of transit riders.

- Integration into the MAG transportation planning program of the priority needs of local minority populations and people in under served communities through the MAG Human Services Planning Program.

- Provide Title VI and EJ information and training for MAG member agencies.

MAG is responsible for incorporating Title VI and EJ requirements in its plans and programs. The enforcement of statewide compliance, including the MAG region, is the responsibility of the Arizona Department of Transportation (ADOT). It is the policy of MAG to assist ADOT in its compliance efforts.

PLANNING MODELS

To provide a technical basis for analyzing the LRTP, MAG maintains a comprehensive set of models to systematically project employment and population, traffic demand, and air quality. These models allow both the projection of current trends and the evaluation of planning alternatives.

Linkages between the MAG models are shown in Figure 4-1. As indicated by the figure, the MAG models are linked beginning with socioeconomic models and ending with air quality models.

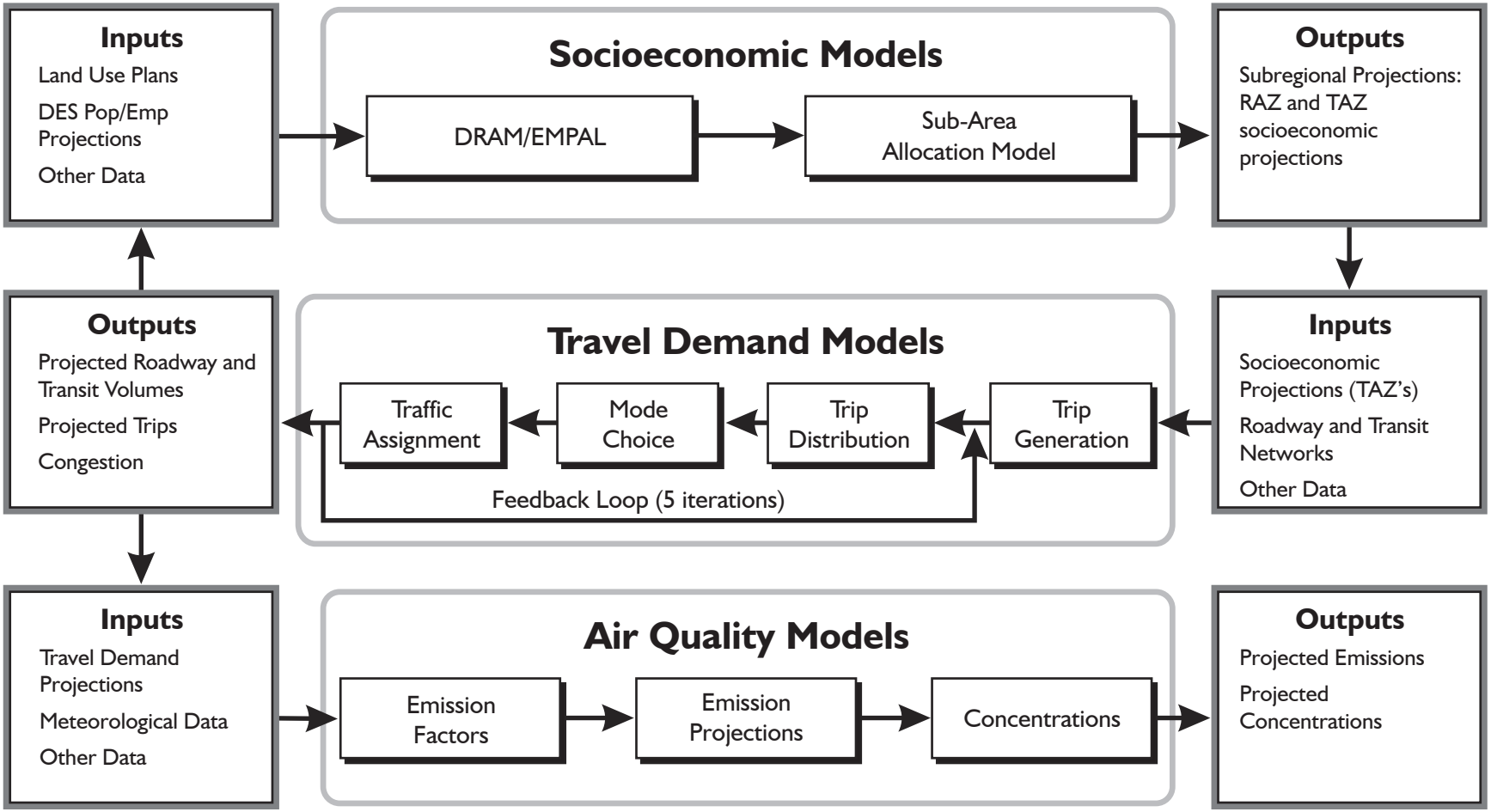
Socioeconomic Models. The primary output of the MAG socioeconomic models is projections of population, households, land use and employment by small area. Key technical inputs include estimates of total county population developed by the Arizona Department of Economic Security (DES), land use plans from MAG member agencies and projected PM peak travel times from MAG transportation models.

MAG uses a nationally-known modeling software package called DRAM/EMPAL to develop subarea forecasts. DRAM/EMPAL allocates county level population and employment forecasts to 147 Regional Analysis Zones (RAZs) in five-year increments.

In general, DRAM/EMPAL allocations are based on the relative attractiveness of each RAZ and its accessibility to other RAZs. For each five-year interval, the amount of land available for development and the type and extent of development are calculated. Also, travel times between RAZs are calculated. Based on statistical analysis of past locational

Figure 4-1

MAG Model Linkages



decisions of businesses and households, DRAM/EMPAL allocates county level population and employment forecasts to RAZs.

RAZ-level forecasts are disaggregated into Traffic Analysis Zones (TAZs) using a Subarea Allocation Model (SAM). These TAZ allocations are based on geographic information system (GIS) representations of existing land use, the adopted general plan for the region, known development plans, proximity to infill and infrastructure, and transportation system accessibility measures.

The TAZ projections used in the 2001 MAG Conformity Analysis were developed using DRAM/EMPAL and SAM along with data from the 1995 Special Census conducted in Maricopa County. The TAZ projections for the build scenario in conformity were adopted by the MAG Regional Council in June, 1997.

Travel Demand Models. The MAG travel demand models forecast roadway and transit use throughout the metropolitan area. Key outputs of these models include projections of average daily traffic, peak hour traffic trips by purpose and mode, traffic volume to roadway capacity ratios, level of service at intersections, delay and travel time. Key inputs to these forecasts include socioeconomic projections by TAZ and planned roadway and transit networks.

A four step modeling process is used. The steps in this process include:

- Trip Generation - Based on the socioeconomic data, the total number of trips produced and attracted by each TAZ are estimated.

- Trip Distribution - The number of trips between all TAZs is estimated based on expected trip length distributions by trip purpose (home based work, shop, school, non-home based) and time of day (AM peak, mid-day, PM peak and night time).

- Mode Choice - The distribution of trips between TAZs is then stratified by transportation mode (i.e., auto driver, carpool and transit).

- Traffic and Transit Assignments - Once mode choice has been determined, the volume of travel on roadway and transit networks is estimated by assigning the trips to the appropriate network. Travel on each roadway segment is estimated by optimizing paths through the network to minimize the travel cost of each trip. Output of the transit assignment is passenger volumes per link. Output of the traffic assignment is the volume of traffic on each link on the highway network for the peak periods and 24 hours. The latter is input directly into the MAG air quality models described below.

Air Quality Models. MAG uses a variety of models (i.e. MOBILE5a, EXPLORA, and PART 5) to analyze the air quality impacts of transportation policies, programs, and plans. These models are used to assure that the TIP and LRTP conform to the applicable air quality plans for the region as required by Federal regulations. Air quality models are also used to develop attainment demonstration plans. The MAG air quality models are used to estimate regional emissions for carbon monoxide, volatile organic compounds (VOC) and particulate matter smaller than 10 microns (PM-10).

A regional emissions analysis is conducted for carbon monoxide, volatile organic compounds, and PM-10. This analysis consists of estimating motor vehicle emissions by time and place based on transportation model inputs of vehicle travel, then aggregating the emissions to daily regional totals. The PM-10 analysis also includes emissions from reentrained dust and road construction.

A detailed description of the air quality modeling process is contained in the MAG 2001 Conformity Analysis.

TRANSPORTATION MANAGEMENT SYSTEMS

ISTEA encouraged the development and implementation of six transportation management systems to monitor the performance of the transportation system, identify transportation needs, and suggest effective strategies for addressing transportation problems. Although later federal legislation substantially relieved states of the responsibility for implementing these management systems, in whole or in part, ADOT has decided to continue with their implementation pending further review. Figure 4-2 lists these management systems and indicates their current operational status.

Figure 4-2: Management System Status

Congestion Management System (CMS)	MAG	Fully operational
Intermodal Management System (IMS)	MAG	Fully operational
Pavement Management System (PMS)	ADOT	Fully operational
Safety Management System (SMS)	ADOT	Partially developed
Bridge Management System (BMS)	ADOT	Fully operational
Public Transportation Management System (PTMS)	RPTA	Fully operational

The State has overall responsibility for ensuring the development of the management systems in cooperation with MAG and other agencies. MAG has specific responsibility for developing the CMS and the IMS, within the MAG region, and the Regional Public Transportation Authority is responsible for developing the PTMS.

To facilitate the use of the management systems in the planning process, each year the latest data and updates to plans, policies, strategies and evaluation procedures are integrated into

a management systems report each year. This report documents needs and methods to evaluate proposed projects, including a section related to Title VI of the Civil Rights Act of 1964. The report is provided to the public and to MAG member agencies early in the process to facilitate the identification of projects for programming and plan adjustments. Projects recommended by sponsors are forwarded to MAG to be rated and analyzed using adopted CMS and Air Quality Rating formulas. Based on these analyses, MAG policies, funding limitations and input from the public, MAG staff and MAG committees develop a draft five-year program and long range plan update for consideration by the Regional Council.

Congestion Management System (CMS). The CMS is a decision support tool that is designed to improve MAG's ability to prepare programs and plans which will reduce congestion and prevent it from occurring where it is now absent. A basic federal requirement of the CMS is that for projects that significantly increase single occupant vehicle (SOV) capacity the CMS must provide "an appropriate analysis of all reasonable (including multimodal) travel demand reduction and operational management strategies for the corridor in which a project . . . is proposed."

To accomplish this objective, the CMS includes the following elements:

- Annual Report on Strategies and Needs. The annual Management Systems report describes current congestion problems, identifies future project needs, assesses progress in implementing congestion relief strategies and monitors the implementation of the program. It also includes project information from the other management systems. The CMS is distributed to MAG member agencies and other public agencies to guide project selection for inclusion in the program and plan.

- Performance Indicators. MAG CMS performance indicators focus on current and forecasted congestion as well as transit load factors.

- Project Rating System. Projects which are submitted to MAG for inclusion in the plan and program are quantitatively ranked to the extent feasible. This process is based on consideration of current and forecasted congestion, accessibility improvements to congested areas, support for local land use planning efforts, cost-effectiveness, and the provision of multimodal options.

  Projects which encourage pedestrian, bicycle, high occupancy vehicle and transit use are given extra points in this rating system. Also, points are given for projects which pursue preferred land-use strategies. These strategies include:

  - Multimodal transportation planning which provides for a choice of modes.

  - Land use planning which encourages the development of activity centers.

  - Planning for the preservation of open space.

- Plans to limit growth in seriously congested areas to activity centers.

- Provision in the development approval process to insure that transit, pedestrian and bicycle needs are considered.

- Land use planning which encourages a balance between housing and employment.

- The use of development impact fees to help limit public subsidy of new development.

- Policy and Funding Analysis. Once projects have been rated, they are analyzed to ensure consistency with applicable policies and funding limitations, including the following:

  - Options to SOV projects have been addressed.

  - Transportation control measures included in the applicable air quality plans are included.

  - Freeway priorities are in accord with MAG freeway criteria.

  - MAG funding plan requirements are met and are consistent with programmed projects.

  - MAG High Occupancy Vehicle Plan requirements are met.

The CMS reinforces links between near-term transportation investments and the long-term implementation of the LRTP. It incorporates the MAG High Occupancy Vehicle Plan and the regional bicycle plan as factors to guide transportation investments, limits project funding to conform to the funding plan contained in the LRTP and helps insure that Federally funded capital investments on streets and freeways preserve and improve transit service. The Annual Report also monitors the implementation of the LRTP and provides data upon which to evaluate and improve the LRTP.

Intermodal Management System (IMS). The MAG IMS focuses on terminals where persons or goods can transfer from one mode of transportation to another. It is intended to ensure that the special needs and problems of these facilities are considered in the programming and planning process. The MAG IMS process includes a comprehensive list of all major freight and passenger terminals in the MAG area, a list of IMS needs and problems compiled from terminal operators and MAG agencies, and a rating system for potential IMS projects.

Pavement Management System (PMS). A PMS is a systematic procedure for evaluating pavement condition and a process to identify preferred actions taken to maintain the quality

of pavements. ADOT is the lead agency responsible for developing the PMS. Implementation of the PMS has been effectively limited to projects on the statewide system and there are currently no plans to implement a statewide PMS rating system. However, several MAG jurisdictions and agencies already have well developed PMSs and use the results of such management systems to guide decisions regarding pavement preservation and maintenance projects.

Safety Management System (SMS). The overall purpose of the SMS is to achieve safety on all roadways. This purpose is accomplished through the development of educational and enforcement programs that promote safety, as well as ranking, recommending and funding various safety related projects at the state and local level. ADOT is the lead agency responsible for developing the SMS. Currently, MAG uses accident rates and traffic volumes to evaluate the need for safety projects.

Bridge Management System (BMS). A BMS is a decision support tool that supplies analyses and summaries of data, uses mathematical models to make predictions and recommendations, and provides a way to efficiently evaluate alternative policies and programs. It consists of a data collection process and procedures for project and policy evaluation.

ADOT is the lead agency responsible for developing the BMS and is coordinating its implementation with MAG and other regional and local agencies. Development of the BMS is ongoing and is based largely on the existing State Bridge Inventory System.

Public Transportation Management System (PTMS). The PTMS is a systematic process that continually collects and analyzes information on the condition and cost of transit assets. This information is incorporated into the planning of the regional public transportation system, improving the ability of decision makers to select cost-effective strategies for providing and maintaining transit assets in a serviceable condition. Transit assets include:

- Maintenance facilities
- Transit stations
- Transit terminals
- Transit related structure
- Transit vehicles

The RPTA is the lead agency responsible for developing and implementing the PTMS in the MAG area. The PTMS was implemented in 1997 and is used by RPTA to provide ADOT with bi-annual updates for the statewide PTMS.

Subsequent to enactment of the National Highway System Designation Act in November 1995, a Final Rule for Management and Monitoring Systems has been released, effective on January 21, 1997. This final rule confirms that the certification and sanction requirements for management systems have been removed and also confirms that States may elect to not

implement the management systems, in whole or in part. At this time, and pursuant to the above final rule, the State of Arizona has not issued any guidance regarding the future implementation of the management systems. In the absence of such guidance, MAG will continue to implement the management systems as appropriate.

SYSTEM PERFORMANCE

From 2001 to 2021, resident population in the MAG transportation modeling area is projected to increase 50 percent while regional travel is expected to increase by 58 percent. In response to this growth, the Long Range Transportation Plan calls for a 66 percent increase in freeway lane miles, nearly a 50 percent increase in arterial street lane miles, a tripling of fixed route bus service, a quadrupling of express bus service, and a 39 mile light rail corridor.

Figure 4-3 provides a comparison of performance measures for 2001 and 2021 with the LRTP in place, and a 2021 no-build scenario. The no-build scenario represents 2021 travel demand assigned to a 2001 network. That is, no additional improvements to 2001 streets, freeways or transit service are reflected in the 2021 no-build scenario.

Figure 4-3 indicates that the LRTP accommodates a 58 percent increase in vehicle miles of travel (VMT), with only a 9 percent decline in peak hour speeds. In contrast, the 2021 no-build scenario exhibits a significant degradation of service. The miles of travel are lower for this scenario because the heavy-congestion results in shorter trips. Average P.M. peak period speed for the no-build scenario is 53 percent lower than the build scenario.

Figures 4-4 and 4-5 illustrate the daily level of travel on freeways and expressways during an average weekday in 2001 and 2021 LRTP, respectively.

Figure 4-3: Comparison of Transportation System Characteristics

Year	Total Population[a] (thousands)	Employment[a] (thousands)	Average Weekday VMT (millions)	Average P.M. Peak Speed[b]	Freeway Lane Miles[c]

2001	3,145	1,505	69.9	30.4	1,532
2006	3,528	1,675	80.8	30.6	1,853
2015	4,231	1,958	98.8	30.7	2,301
2021	4,702	2,118	110.1	27.9	2,301
2021 [d]	4,702	2,118	107.2	13.1	1,532

[a] Population and employment estimates are for the transportation modeling area. Total population includes resident population in households and group quarters, as well as transient and seasonal population. The employment estimates includes self-employed individuals.

[b] Average speeds on streets and freeways during the P.M. peak hour.

[c] Ramps and HOV lanes are included in the lane miles reported for freeways.

[d] No-build simulation utilizes 2001 network with 2021 travel demand.

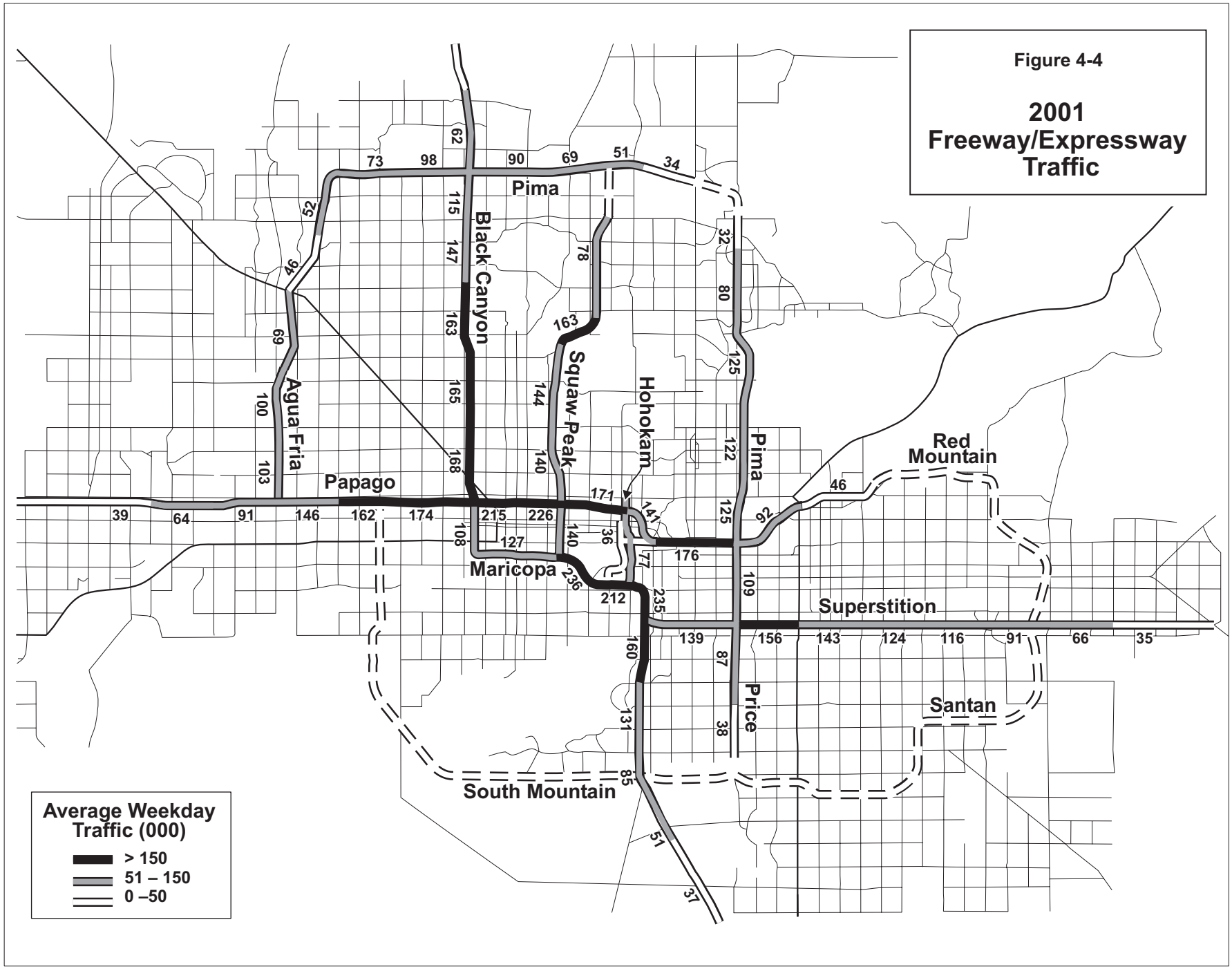


Figure 4-4: 2001 Freeway/Expressway Traffic

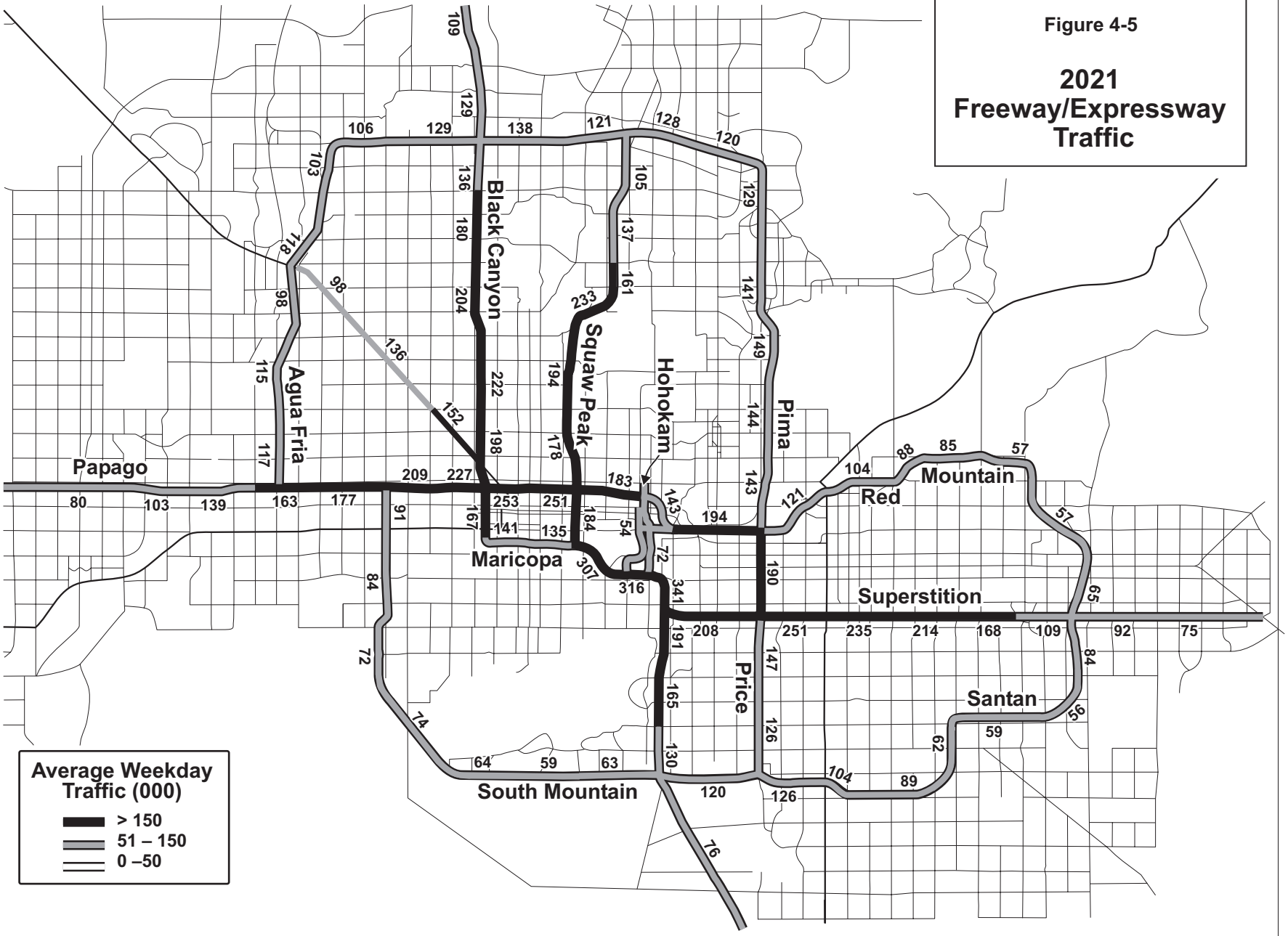


Figure 4-5: 2001 Freeway/Expressway Traffic

SECTION 5

AIRPORTS

MAG is the officially designated agency for regional aviation system planning. The first MAG Regional Aviation System Plan (RASP) was developed in 1979, and MAG updated the Plan in 1986 and 1993. In December 1996, the Regional Council approved a MAG RASP Implementation Study to facilitate implementing the RASP. The major findings and recommendations of the Update and the Implementation Study are noted below. Another update of the RASP is currently underway.

DEMAND PROJECTIONS

Airline aircraft activity at Phoenix Sky Harbor International Airport nearly doubled between 1960 and 1990, while the number of air passengers increased eighteen fold. In 2000, Phoenix Sky Harbor was estimated to have over 36 million passengers. By 2021, it is projected that total air passengers served at Sky Harbor will exceed 78 million passengers a year.

The aviation demand projections for Phoenix Sky Harbor are drawn from the 1993 MAG RASP Update. Projections of based aircraft and aircraft takeoffs and landings are also prepared for 16 general aviation airports. Projections for 2021 were estimated by extrapolating recent growth rates. New long-range projections, however, will be developed in the next RASP Update.

General aviation based aircraft in Maricopa County have increased five-fold between 1960 and 1990. However, based aircraft are forecast to grow at a much slower rate over the next 20 years because of the increase in cost of owning and operating an aircraft, and the subsequent decline in the manufacture of general aviation aircraft. It is anticipated that there will be approximately 4,880 based aircraft by 2001.

UPDATE RECOMMENDATIONS

The 1993 MAG RASP Update evaluated the long-term air transportation needs in the region, and recommended improvements to accommodate future demand. The Update recommendations include, but are not limited to:

- Extend the north runway at Phoenix Sky Harbor International Airport.
- Develop Williams Gateway Airport as a civilian airport serving commercial carriers, cargo and general aviation.

- Construct parallel runways at Phoenix Goodyear and Glendale Municipal Airports.

- Construct runway extensions at the following general aviation airports:
  - Buckeye Municipal
  - Glendale Municipal
  - Mesa-Falcon Field
  - Wickenburg Municipal

- Identify and protect potential new Visual Flight Rule (VFR) airport site areas to serve general aviation demand beyond 2015 including:
  - Northwest Phoenix/Peoria/Pleasant Valley
  - Estrella Sailport/Gila River Indian Community

- Protect the mission of Luke Air Force Base by establishing procedures to minimize interactions with military activity.

- Maximize economic impacts for Maricopa County with Williams Gateway Airport reused as a satellite commercial service, cargo and general aviation airport.

- Support implementation of individual airport master plans.

- Pursue airport demand management options.

- Accommodate general aviation demand primarily at existing publicly owned airports.

A map of the RASP is identified in Figure 5-1. The map classifies airports by commercial service, general aviation reliever and general aviation categories. A general aviation reliever airport is an airport that relieves Phoenix Sky Harbor Airport by providing an alternative landing place for small aircraft. The map also identifies the location of new airport runways proposed.

An updated project listing together with costs for the MAG system airports was conducted as a part of the MAG RASP Implementation Plan approved by the MAG Regional Council in December, 1996. The project listing is consistent with the recommendations contained in the 1993 MAG RASP Update, but the costs are updated, and more projects funded solely from local sources are identified. These revised costs and projects are identified in the funding plan presented below.

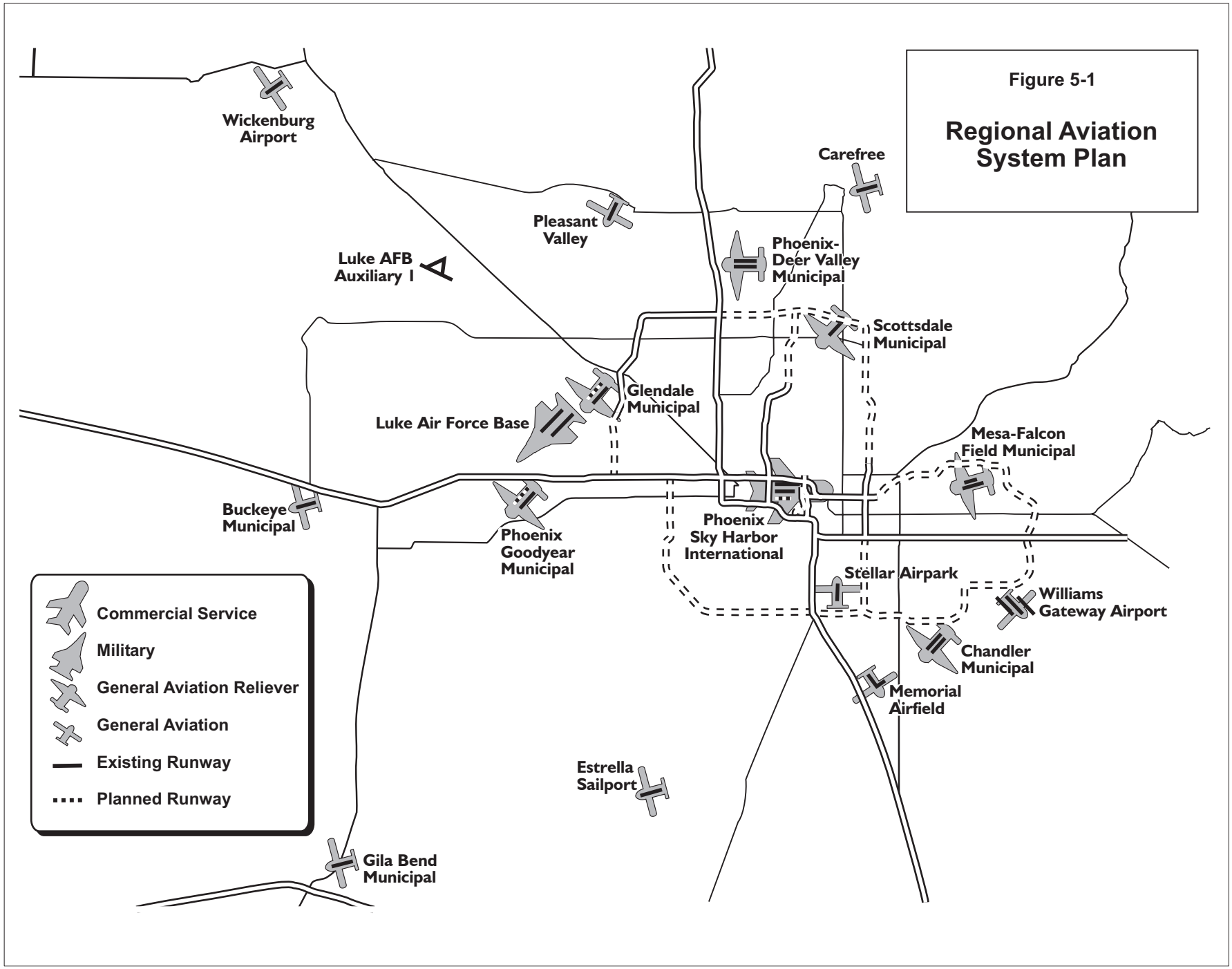


Figure 5-1: Regional Aviation System Plan

FUNDING PLAN

A funding plan was developed to implement the Update recommendations. Airport improvement costs were estimated in 2001 dollars as noted in Figure 5-2.

Of the approximately $888 million needed in airport development projects, $548 million are eligible for federal funds, $26 million are eligible for state funds, $199 million is required from local sponsors and $115 million is required from private and other sources (e.g., airlines, developers, non-aviation government agencies, and fixed base operators).

This assumed the federal Airport Improvement Program (AIP) program continues through the 2021 planning period at an annual national funding level of $2 billion, and State airports continue to receive between $30 and $50 million annually in AIP funds. This program generates an estimated $118 million in entitlement funds for Phoenix Sky Harbor International, Williams Gateway and Scottsdale Airports; and between $156 million and $338 million in discretionary funds that can generally be used at any eligible airport.

Figure 5-2 Regional Aviation System Capital Funding Plan (in millions of 2001 dollars)

PHASE	LOCAL	STATE	FEDERAL	OTHER	TOTAL
Phase I	$107	$17	$365	$73	$562
Phase II	40	4	80	18	142
Phase III	52	5	103	24	184
Total All Phases	**$199**	**$26**	**$548**	**$115**	**$888**

An estimated $1.0 billion in Passenger Facility Charges (PFCs) could be generated at Phoenix Sky Harbor International and Williams Gateway Airports though 2021. It is anticipated that Scottsdale Airport will also be eligible to apply for PFC revenues. The effects of imposing PFCs for use at eligible airports and the additional AIP funding that may be available for other airports in the Region for airport development would be significant.

Assuming the Arizona Department of Transportation funding level continues at $10 to $12 million annually, and assuming the Region receives one-half the State's total, an estimated $100 million to $120 million could be made available from the State program to airports in the MAG Region from 2001 through 2021. Total operations and maintenance costs for airports are estimated to be $2.6 billion over the 20 year planning period.

IMPLEMENTATION

Subsequent to the approval of the MAG RASP Update in December 1993, two major projects that were recommended have either been implemented or are in the implementation phase. In March 1994, Williams Air Force Base was opened to civilian use and redesignated as Williams Gateway Airport. At Sky Harbor the third runway was opened to traffic in October, 2000, and the extension of the north runway is currently underway.

To facilitate the implementation of other recommendations in the MAG RASP Update, the MAG Regional Council approved a MAG RASP Implementation Study in December 1996. That study:

- Created an airport database and accompanying sketches to facilitate maintaining data on MAG airports.

- Established a Consolidated Airport Capital Improvement Program (CACIP) along with generalized priorities by project category. While this CACIP did not change any of the recommendations in the MAG RASP Update, it does include a more extensive list of projects that are based on local needs and are not eligible for federal or state funds. It also includes more current cost estimates. The results of the CACIP are included in the funding program.

- Assessed intermodal access to airports.

- Prepared computerized noise contours and superimposed them over existing and general plan land use coverages.

In 1996, MAG staff also worked with the MAG Building Codes Committee to develop a sound attenuation ordinance for the area around Luke Air Force Base. This ordinance will help meet one of the objectives of the MAG RASP -- to preserve the military mission of Luke Air Force Base -- by reducing interior noise levels of new residences constructed within the noise contours of Luke Air Force Base. The model ordinance was approved by the MAG Regional Council in April, 1996. Subsequently several member agencies have adopted ordinances based on the model ordinance. These members include El Mirage, Maricopa County, Goodyear and Glendale.

The MAG RASP Update 2000 is underway and the first phase will include the following tasks:

- Inventory - a database will be prepared in hard copy and electronic format from which the status of the system can be established. It will also provide information necessary to prepare forecasts and determine facility requirements.

- Forecasts - forecasts of passengers, aircraft operations, cargo and based aircraft will be prepared for the region and by individual airport. Peak demand will also be established to facilitate capacity analysis.

- Demand/Capacity Analysis - annual and hourly airport capacities will be calculated. The resulting capacities will be compared with forecasts to identify potential capacity shortages.

- Alternatives - alternatives will be defined in order to examine different development options.

These alternatives will then be evaluated in terms of factors such as airspace, land use compatibility, cost, ground access and user convenience. The evaluation of the alternatives together with input from aviation stakeholders and the MAG RASP Policy Committee will be used to develop a plan recommendation and an implementation program.

SECTION 6

BICYCLES

INTRODUCTION

In general, bicycling is a local activity since most trips are less than five miles, and the average trip is approximately two miles (Nationwide Personal Transportation Survey, 1995). In order to make cycling a convenient and safe mode of transportation, cyclist mobility through all areas and improved access to activity centers must be considered in bicycle planning. While some planning efforts focus on developing a separate system of bicycle facilities, these systems may not adequately address the needs of most cyclists and are usually prohibitively expensive. The most comprehensive and affordable planning efforts strive to make bicyclists a part of the existing transportation infrastructure by improving the safety and attractiveness of shared roadway space. Bicycle planning should also consider and use existing opportunities, such as open space corridors for trails, and address bicycle safety education and encouragement. Finally, bicycle planning needs to help create communities which are more "bicycle-friendly" through planning, design, and regulation (AASHTO Guidance for the Development of Bicycle Facilities, 1991).

On June 9, 1998, President Clinton signed the Transportation Equity Act for the 21st Century into law. This legislation has numerous provisions which relate to improving conditions for bicycling and walking, and improving safety of the two modes. TEA-21 confirms and continues the principle established in the Intermodal Surface Transportation Efficiency Act (ISTEA): "due consideration" of bicycle and pedestrian travel needs is to be given during the planning, developing, and construction of all Federal-aid transportation projects. According to the Federal Highway Administration Guidance on Bicycle and Pedestrian Provisions of Federal Transportation Legislation:

> "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities. In the planning, design, and operation of transportation facilities, bicyclists and pedestrians should be included as a matter of routine, and the decision to not accommodate them should be the exception rather than the rule...Maintaining access to the transportation system for nonmotorized users is not an optional activity.

Federal transportation policy goals include increasing non-motorized transportation to at least 15 percent of all trips and to simultaneously reduce the number of non-motorized users killed or injured in traffic crashes by at least 10 percent.

MAG has been active in promoting the establishment of improved travel opportunities for bicyclists. In 1991, MAG developed a plan to address the needs and concerns of bicyclists in the region, and to encourage bicycling as a way to alleviate congestion and air pollution. The MAG Regional Bicycle Plan was adopted by the Regional Council in February, 1992. The Regional Bicycle Plan has been incorporated into the region's Long Range Transportation Plan.

In March, 1999, a bicycle plan update was approved by the MAG Regional Council. The update revised goals and objectives, changed evaluation criteria for project selection, enhanced plan maps, updated the funding plan and documented future possible planning activities. Because the original 1992 plan emphasized on-street facilities, the update also gave limited attention to potential off-street facilities in providing access and mobility for bicyclists. Creating a regional off-street multi-use path/trail plan was identified as an important future planning activity during the plan update. The off-street network was envisioned to include paved paths and unpaved transportation trails. The Regional Off-Street System (ROSS) Plan is the culmination of this effort.

The Regional Bicycle Task Force oversees the update of the Regional Bikeways Map. Updated in alternating years, this map shows existing, locally-designated bicycling facilities, and is provided for free distribution. This year, two new categories have been added to the map to aid bicyclists in planning trips: popular undesignated routes and transportation trails. The map also includes hints on defensive cycling, regional phone numbers, and web sites of bicycling groups. The map is available in digital format to MAG members and is also on the MAG web site. Out of 15,000 miles of roadway in the MAG region, the map shows 660 miles of bicycle lanes, 375 miles of bicycle routes, and 125 miles of paved multi-use paths.

MAG REGIONAL BICYCLE PLAN

The MAG Regional Bicycle Plan focuses primarily on on-street facilities, and was updated in 1999. Issues and needs were identified, and adopted goals and objectives were refined in light of these issues and needs. Maps of planned bicycle routes were created, as well as a composite map of planned and existing local bicycle facilities. In addition, the criteria used to select projects for funding were reviewed. Changes to the Congestion Management System (CMS) were suggested which incorporated the revised goals and objectives. Policies were developed for rating bicycle projects, and a revised RBTF rating system was created which incorporated updated goals and objectives. The major elements of the plan are summarized below.

Plan Goals and Objectives. The goals of the MAG Regional Bicycle Plan fall within the realms of engineering and planning, education, enforcement, and encouragement. Each goal lists a number of objectives that will help achieve the goal. These goals and objectives are meant to provide cities and towns within the MAG region with guidance in planning, designing, and implementing a system of internal and regionally connected bikeways that serve the daily

travel needs of bicyclists. The goals and objectives also provide guidance in advancing safer operation of bicycles and promoting bicycling as a way to make daily travel trips without polluting the air or adding to congestion related to travel of single-occupant vehicles. The four goals are:

- **Engineering and Planning Goal:** The Engineering and Planning Goal is to develop bikeways as an integral part of a multi-modal transportation system in the MAG region and, as a consequence, to make bicycling a viable option for daily travel trips for all purposes.

- **Education Goal:** The Education Goal is to increase public awareness of safer bicycling behaviors and the need for bicyclists and motorists to share the road. A secondary goal is to educate engineers and planners on bicycle issues.

- **Enforcement Goal:** The Enforcement Goal is to encourage police agencies to increase levels of enforcement of traffic laws most often violated by bicyclists and to improve tolerance and courtesy among all roadway users.

- **Encouragement Goal:** The Encouragement Goal is to promote bicycling as a means of personal mobility for local, daily travel trips for all purposes and as a form of healthy recreation and exercise.

Regional Bicycle Plan Maps. A component of the MAG Regional Bicycle Plan is the specification of a planned system of bikeways to encourage the use of bicycles for making daily trips. The routes were designed as a system of long, interconnected routes for use by the commuting, touring, recreational, or training bicyclist to travel within or through the Valley. Current research shows that the majority of cyclists tend to ride short distances (less than two miles) and prefer to ride on streets without much automobile traffic. Therefore, rather than focusing efforts only on the needs of commuters and/or highly experienced or technical cyclists, future planning efforts emphasizes the needs of the majority of cyclists in determining facility design and location.

The regional system forms the skeleton from which each jurisdiction can provide localized service to important destinations within their jurisdiction. This skeleton system can serve a vital regional function by linking important regional destinations, providing links between jurisdictions and by reducing single-occupant vehicle (SOV) trips to improve air quality and lessen traffic congestion. The initial Plan adopted in 1992 included a 662 mile on-street system. An additional 158 miles were identified during the update process and are included in the planned regional route system. Figure 6-1 shows the Regional Bicycle Plan, including the initial Plan and the additional adopted routes.

REGIONAL OFF-STREET SYSTEM (ROSS) PLAN

The Regional Off-Street System (ROSS) Plan reveals a region-wide system of off-street paths/trails for non-motorized transportation. Throughout the MAG region, numerous opportunities for off-street travel by people who walk and bicycle exist along areas such as canal banks, utility line easements and flood control channels. These types of rights-of-way and easements are found throughout Maricopa County and intersect numerous arterial streets where local daily destinations are typically located. The goal of the ROSS plan is to help make bicycling and walking viable options for daily travel trips using off-street opportunities.

The ROSS plan provides guidance to MAG member agencies in creating an off-street, non-motorized transportation system. The Plan focuses on potential corridors that form the backbone of a regional off-street system of routes. Other off-street segments will be necessary to provide additional connections between origins and destinations. The ROSS Plan identifies issues associated with paths/trails and non-motorized transportation, identifies corridors which could be used for paths/trails in the MAG region, and provides design guidelines for paths/trails. Creating the plan also helps to support for federal transportation funding requests.

RBF Consulting was hired to assist the Regional Bicycle Task Force (RBTF) and Pedestrian Working Group (PWG) to develop the ROSS Plan. In consultation with MAG, the consultant developed a scope of work to complete the ROSS Plan. Key planning tasks included public and agency involvement, issues identification, developing a plan vision statement, goals and objectives, identifying and evaluating corridors, creating design guidelines, developing implementation strategies, and identifying potential funding sources.

Vision Statement, Goals and Objectives. The vision statement paints a picture of the future once the Plan is implemented, and helps define the future of the regional off-street non-motorized transportation system. The vision statement of the ROSS is:

- Residents of the MAG region have safe, convenient access to an attractive, multi-use, non-motorized transportation system that provides a viable alternative to driving for local trips, such as trips to work, school, shopping and leisure activities.

The five key issue areas defined in the issues identification process provide the framework for the goals and objectives. The goals address the five issue areas of access, safety, connectivity, user-friendly, and implementation, and provide guidance to MAG and its member agencies in making bicycling and walking viable options for daily travel trips. Replacing single-occupant motorized vehicle trips with bicycling and walking helps to improve air quality and relieve congestion. Each goal lists a number of objectives which are more specific measures to help achieve each of the goals. The vision statement, goals and objectives are in Section IV of the ROSS.

- **Accessibility Goal**: Provide sufficient, convenient access to the non-motorized off-street transportation system which is highly visible to existing and potential users.

- **Safety Goal**: Develop an off-street system of paths/trails that is safe for a variety of users.

- **Connectivity Goal**: Connect origins and destinations with paths/trails, and link paths/trails to the existing on-street transportation system and other transportation modes.

- **User-Friendly Goal**: Develop a system of paths/trails that considers the needs of users and potential users (user-friendly).

- **Implementation Goal**: Achieve a truly regional system of off-street pathways by assisting mag member agencies in developing portions of the off-street system under their jurisdiction.

Corridor Identification. Several types of corridors were identified for inclusion in the ROSS plan. These corridors typically have a primary purpose other than non-motorized transportation, and intersect arterial streets where many daily destinations, such as grocery stores and employers, are located. The MAG region is fortunate to have a variety of linear corridors and rights-of-way which can be utilized in an off-street transportation system by bicycles and pedestrians. These potential corridors form the backbone of a regional off-street system of routes. Other off-street segments may be needed to provide additional connections between origins and destinations. The goals and objectives identified in Section IV help provide guidance on developing other off-street segments. Of particular importance, public lands and existing parkland, such as mountain preserves, can provide vital links in the system. These and other opportunities and constraints should be examined more fully by jurisdictions as they implement the system. Identified corridors include canals, desert washes and waterways, flood control structures and rights-of-way, highway and freeway rights-of-way, railway corridors, and utility easements.

Design Guidelines. To create design guidelines for paths/trails in the corridors identified in the ROSS Plan, three representative projects were chosen for their potential to illustrate a variety of issues that might be encountered when developing path/trail systems in the various corridors. These issues include, among others, comfortably crossing busy roadways, creating a user-friendly system when right-of-way is limited, and creating paths/trails which complement the primary use of the corridor, such as flood control. For each representative project, an analysis of opportunities and constraints led to schematic drawings illustrating how to appropriately address issues and work within the constraints. Representative projects were chosen to provide a broad range of examples of issues related to the different types of the

corridors identified. These three projects included the Dysart Drain, the Creamery Branch rail spur, and the Roosevelt Water Conservation District Canal.

Basic design guidelines are provided to assist MAG member agencies in developing the corridors identified in the ROSS. These guidelines have been developed based upon the analysis of the representative projects, and include standards from several sources, including: (1) MAG member agencies; (2) MAG *Pedestrian Area Policies and Design Guidelines*; (3) MAG *Pedestrian Plan 2000*; (4) American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*; (5) Trails for the 21st Century; and (6) Universal Trail Assessment by Beneficial Design.

After discussing factors affecting path and trail usage, and path/trail user needs, design guidelines are documented in the ROSS. Design guidelines have been divided into two general categories. The first category, general design guidelines, apply to all types of off-street corridors. General guidelines have been stratified into the general goal areas of access, safety, connectivity, and user-friendly. The second category, specific design guidelines, have been developed to apply to the each of the specific corridor types, such as canal and utility line easements, identified in the ROSS.

Implementation and Funding. The implementation section of the ROSS begins with a general process to develop an off-street non-motorized transportation system, including a model ordinance for adoption of the MAG ROSS Plan. Sample evaluation criteria are also included. Implementation issues, such as negotiating rights-of-way and potential liability concerns, are identified and possible solutions are presented. This section concludes with recommendations identified as either a “MAG Action” or a “MAG Support”, in a manner similar to the MAG *Pedestrian Plan 2000.*

Funding for construction of paths/trails is a critical element of implementing a regional system of non-motorized off-street transportation system. Several sources of funding are identified in this section of the ROSS Plan. There are many sources of public sector (government) funding available for paths/trails, pedestrian and bicycle transportation facilities, such as the Transportation Equity Act for the 21st Century (TEA-21) and Heritage Funds.

Another source of funding that can be overlooked is the private sector. Sometimes commercial enterprises are interested in contributing to a path/trail project. These contributions might help increase business access and foot traffic, improve the visual appearance of the business, or improve corporate image through a positive community contribution. Neighborhood associations may be interested in funding segments which improve neighborhood access, creating safety patrols, or providing maintenance through “adopt a trail” programs. In addition, developers may be able to construct portions of paths/trails if communities have established the intent to develop an off-street system.

If citizens support path/trails, and public funding is lacking, additional new funding opportunities are available, including community facility districts, general obligation bonds, revenue bonds and transaction privilege/sales tax.

FINANCIAL PLAN

The proposed bicycle plan should be viewed as an illustrative plan rather than a funded element of the MAG LRTP. The cost to reconstruct existing roadways to accommodate the above plan is beyond reasonable available revenues at this time. The Plan can serve as a guide to coordinate street and bicycle investments within cities and between jurisdictions. Nevertheless, the MAG Long Range Transportation Plan (LRTP) and Transportation Improvement program (TIP) include a strong commitment to implement bicycle facility improvements. Approximately sixty percent of the centerline mileage of street projects in the TIP that add new through lane capacity include improvements to accommodate bicycle usage. The funding for these projects are accounted for in the Street Section of the LRTP as it is not possible to separate out the combined cost of adding new through lanes and bicycle improvements in the same project.

MAG has committed a large share of the federal funding available to for bicycle projects. From 2000 to 2012, this funding consists primarily of Congestion Mitigation and Air Quality (CMAQ) funds. The distribution of these funds to bicycle projects is projected as a constant share of CMAQ.

After 2012, when outstanding debt for new freeways is retired, large amounts of surface transportation program (STP) funding will become available for non freeway modes. The distribution of these funds to bicycle projects is projected as a constant share of STP.

The actual amounts allocated for bicycle projects could vary as a result of changes in projections of population, inflation, distribution formulas and other key variables. The following table is in constant 2000 dollars.

	Federal	Local	Total
● 2002-2011	$ 92 Million	$ 14 Million	$106 Million
● 2012-2021	$ 146 Million	$ 16 million	$162 Million
Total	$ 238 Million	$ 30 Million	$268 Million

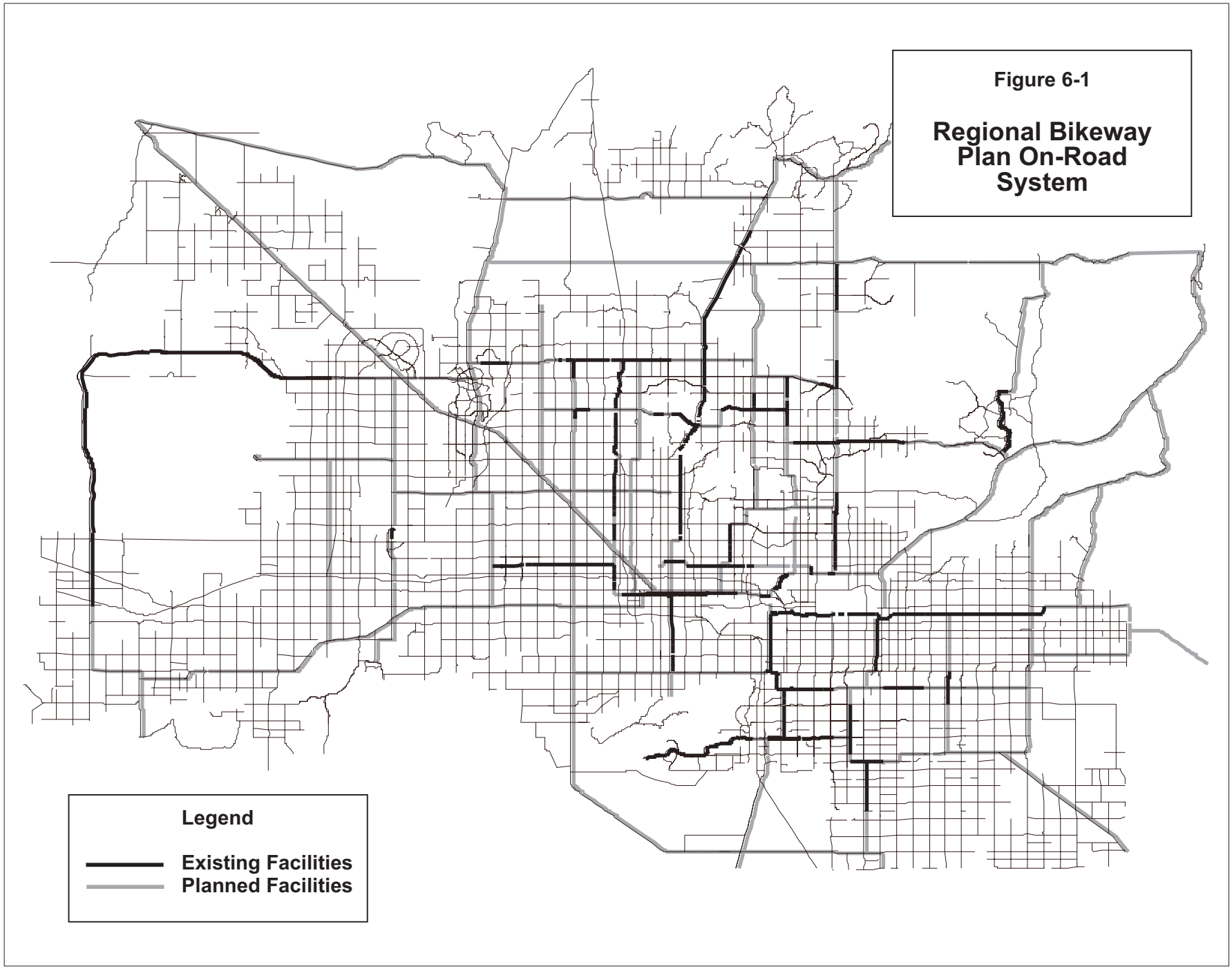


Figure 6-1: Regional Bikeway Plan On-Road System

SECTION 7

FREEWAYS/EXPRESSWAYS

The Maricopa Association of Governments (MAG) is responsible for developing freeway plans for the region. The Arizona Department of Transportation (ADOT) is responsible for constructing and maintaining freeways / expressways. This section provides history on freeway development and discusses plans, priorities and funding for new freeways. Plans and funding for improvements to existing freeways and regional access routes are discussed in the last sections.

A county-wide overview map of the regional highway system that emphasizes regional access routes is included as Figure 7-1. A more detailed map of the urban freeway/expressway system is shown in Figure 7-2. Completion dates for the planned system are shown in Appendix A.

HISTORICAL PERSPECTIVE

1960. In 1960, the Arizona State Highway Commission, Maricopa County and the City of Phoenix commissioned a study titled: "A Major Street and Highway Plan, Maricopa County, Phoenix Urban Area." This was the first freeway plan for the Valley and included the Black Canyon, Maricopa, Superstition, Papago, Outer Loop, Paradise, Squaw Peak, portions of Grand and portions of the Red Mountain.

1983. Between 1960 and 1983 progress on this plan was slow. The Black Canyon and Maricopa Freeways were completed, while the Superstition and Papago were nearing completion. During this period the right-of-way for the Outer Loop was not protected. As a result, in the early 1980s, studies were completed to relocate the Outer Loop outward to undeveloped land. In this period portions of the Paradise, Squaw Peak and Red Mountain were removed from the Plan and these facilities were no longer connected to the Outer Loop.

1985. In 1985, MAG completed a major update of the Regional Freeway Plan that greatly expanded the miles of planned freeways. In the central area, the Squaw Peak, Paradise and Red Mountain were reconnected to the Outer Loop and the South Mountain Parkway was added. In the East Valley, a loop facility (consisting of the Red Mountain and Santan) was added. In the West Valley, the Estrella Freeway and Grand Expressway were added to the Plan. In October 1985, the voters of Maricopa County approved a half-cent sales tax for 20 years to complete this plan.

1994. By 1994, major progress had been made toward completing planned freeways. The City of Phoenix completed the Squaw Peak to Glendale Avenue, ADOT completed the Superstition Freeway, and Intestate funds were used to complete the Papago. Sales tax funds were used to complete portions of the Pima, Agua Fria, Red Mountain, Hohokam and Squaw Peak.

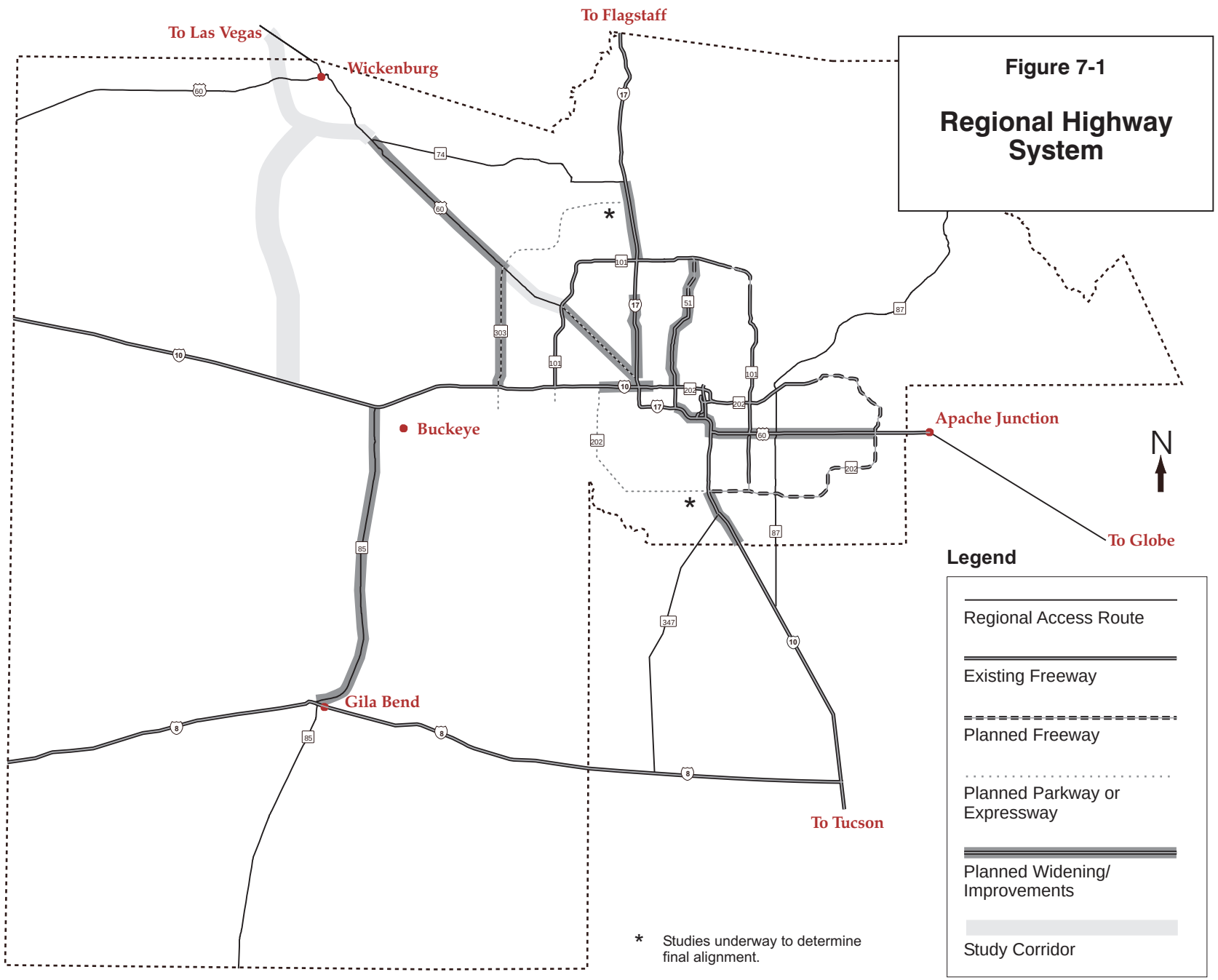


Figure 7-1: Regional Highway System

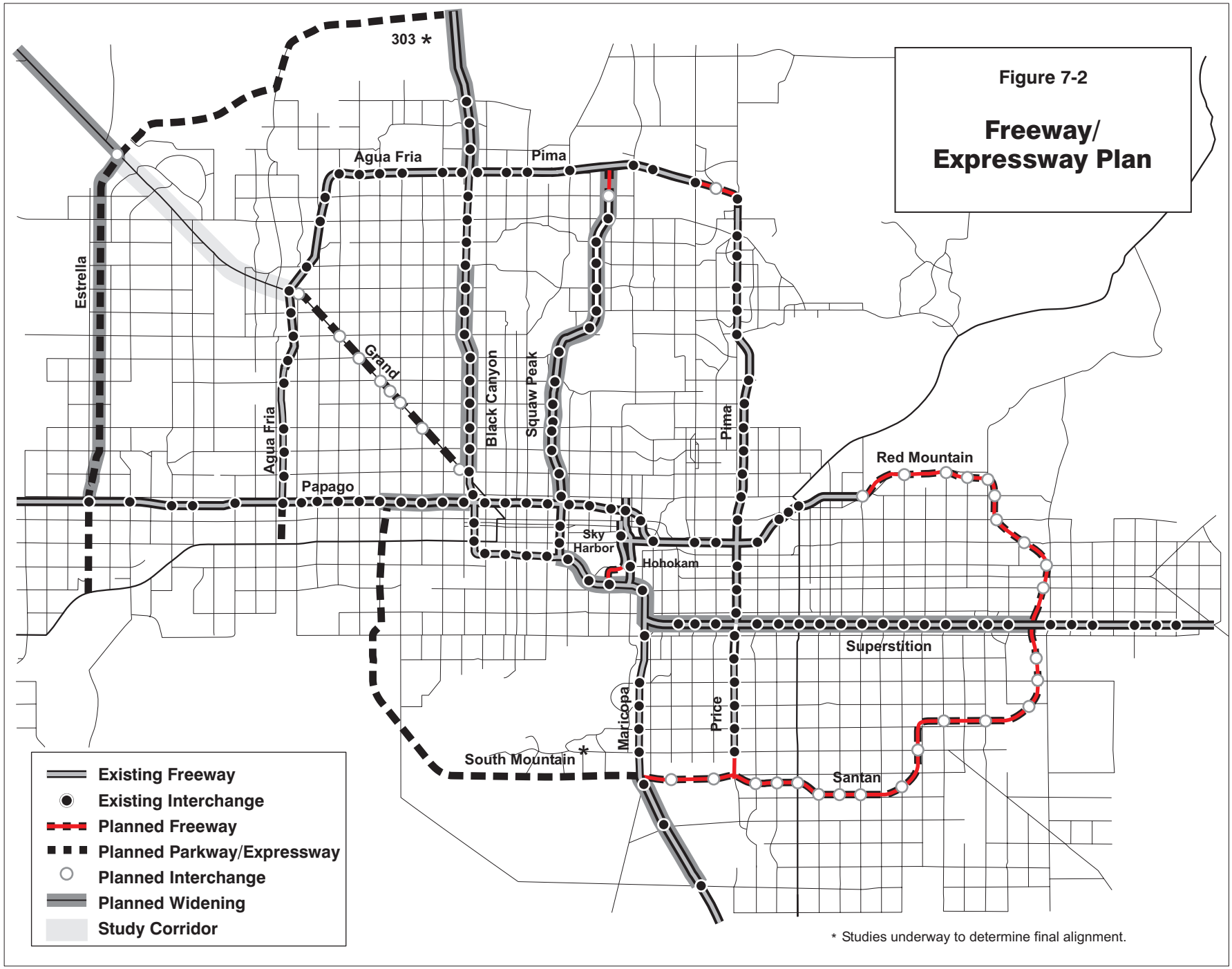


Figure 7-2: Freeway/Expressway Plan

However, between 1985 and 1994 a funding short-fall developed. As a result of an extended downturn in the economy, revenues were less than projected. Also, more detailed engineering, extension of time horizons and community input increased planned freeway costs.

To offset this shortfall and to improve transit services, Proposition 400 was presented to the voters of Maricopa County. This Proposition would have completed planned freeways by 2015 and doubled bus services. The financial mechanism included a new half-cent sales tax split evenly between freeways and transit, and a 10 year extension of the existing half-cent sales tax for freeways. This proposition was defeated in November 1994.

1995. The Intermodal Surface Transportation Efficiency Act of 1991 requires a balanced funding plan as a component of long range transportation plans. As a result of the defeat of Proposition 400 and a proposed plan by the Governor, the number of freeway miles in the MAG Freeway Plan was reassessed. Planned freeway corridors were deleted and design changes were made to remaining planned corridors. Corridors removed from the Freeway Plan included the Paradise Parkway, Grand Expressway and Estrella Freeway.

1999. TEA-21 substantially increased the amount of federal funding allocated to the region and to the state. MAG has worked closely with ADOT for a fair share of State funding for the region. Also, additional bonding measures have been approved. As a result there is now a commitment to complete planned new freeways by 2007. In addition, the portion of Grand Avenue between I-17 and 101 has been re-added to the plan as an expressway and improvements have been included in the Estrella corridor (Loop303).

2000. MAG Regional Council authorized use of funds originally set aside for South Mountain Parkway interim facility for development of a environmental impact statement (EIS) for the corridor. The Council also set aside funding for right of way (ROW) preservation in the South Mountain corridor.

2001. In January 2001, the Council approved the Lone Mountain Alignment as the preferred option for the Loop 303 connection to I-17 and designated the New River Alignment for further study.

PLANNED NEW FREEWAYS/EXPRESSWAYS

This section addresses new freeways and expressways approved for sales tax funding by the voters in 1985. Completed and planned mileages are listed in Figure 7-3.

Corridor Improvements. Since the passage of Proposition 300 in 1985, 74 miles of sales tax funded freeways have been completed as listed in Figure 7-3. After corridor deletions in 1995 and re-addition of Grand, 112 miles of new controlled access highways remain to be completed.

The Agua Fria Freeway was opened to traffic from I-10 to Northern Avenue in October 2000. This completes the construction of the Agua Fria Freeway.

The Price Freeway was opened to traffic to Frye Road in December 2000. The Price Freeway will be fully constructed by February 2001, except for the interchange with the Santan Freeway.

The Pima Freeway was opened to traffic from Shea Boulevard to Princess Drive/Pima Road in January 2001. The Pima Freeway is scheduled to be fully constructed between the Red Mountain Freeway and Princess Drive/Pima Road by February 2001. The Pima Freeway between I-17 and 56th Street was opened to traffic as an interim facility and final construction will be completed between I-17 and Scottsdale Road in Summer 2001.

Priorities. MAG has responsibilities for establishing freeway priorities. In this report, freeway priorities are expressed as completion dates as listed in Appendix A.

Recent acceleration of freeway construction has followed previously developed priorities as documented in the 1997 update of the LRTP. Development of the priorities were guided by criteria adopted by the MAG Regional Council in March 1993 and include:

- Travel Demand
- Congestion Relief
- Accident Reductions
- Air Quality Improvements
- Cost Effectiveness
- Joint Funding
- Social and Community Improvements
- System Continuity and Mobility

Figure 7-3: New Freeways and Expressways[1]

Corridor	Existing Miles[2]	Planned Miles	Total Miles
Agua Fria Freeway[3]	23	0	23
Grand Expressway[4]	0	12	12
Estrella Expressway[5]	0	19	19
Hohokam Expressway	3	0	3
Pima Freeway	16	12	28
Price Parkway	9	1	10
Red Mountain Freeway	13	18	31
Santan Freeway	0	24	24
Sky Harbor Facilities	2	1	3
South Mountain Parkway[6]	0	23	23
Squaw Peak Parkway	8	2	10
TOTAL	74	112	186

1. Includes only new freeways and expressways funded with half-cent sales tax revenue.
2. Does not include sections of the Squaw Peak completed by the City of Phoenix or sections of the Estrella north of Grand . All mileages are as of December 2000.
3. Includes a 1.4 mile section from Interstate 10 to Maricopa County 85.
4. Includes controlled access improvements to Grand Avenue from the Agua Fria Freeway to Interstate 17.
5. Extends from Maricopa County 85 to Grand. The facility is currently a two lane controlled access road. Plans are to widen the facility to four lanes and to make other improvements consistent with an at-grade expressway
6. Does not include mileage for the Riggs Road Truck Bypass route.

In addition, the following factors adopted by the State legislature in 1994 are considered when developing freeway priorities:

- Establishment of a complete freeway system as rapidly as possible
- Construction of segments to serve regional needs
- Construction of segments that provide connectivity with other elements of the freeways system

System Upgrades. After the defeat of Proposition 400 in November 1994, several reductions were made in the freeway plan to bring costs and revenues into balance. With increased revenue, some of these reductions have been re-added to the Plan. Items included with this update are (1) full freeway lighting, (2) restoration of a minimum six lane cross section for all planned sections and (3) installation of intelligent transportation system improvements.

Agua Fria Freeway (Loop 101). The Agua Fria Freeway has been completed between Interstate 10 and Interstate 17.

The Freeway/Expressway Plan presented to voters in 1985 included an extension of the Agua Fria Corridor from I-10 to Buckeye Road. This extension is currently on the Plan as an expressway.

Estrella Expressway (Loop 303). The Estrella Expressway was added to the MAG Plan in July 1985 for purposes of right-of-way protection. After Proposition 300 was approved by the voters, the Estrella Freeway was added to MAG plans for completion by 2005. In exchange for right-of-way dedications, an interim controlled access two lane facility was completed in this corridor between Grand Avenue and Thomas Road in 1992.

With the defeat of Proposition 400 in 1994, this corridor was removed from the MAG Freeway/Expressway Plan. The Estrella was added back to the MAG LRTP in 1999 as a four lane controlled access facility between MC 85 and Grand Avenue. The section from Grand Avenue to I-17 is designated as a study corridor.

The MAG Transportation Improvement Program includes funding for an interim grade separation at Grand, a road connection between Grand and Lake Pleasant Road, funds for safety improvements and an improved road connection south of Thomas Road to Cotton Lane. In January 2001, the MAG Regional Council approved the Lone Mountain Alignment as the preferred option for the Loop 303 connection to I-17 and designated the New River Alignment for further study.

Grand Expressway (US 60). In 1985, the map presented to the voters of Maricopa County included an expressway on Grand Avenue between McDowell Road and the Beardsley Canal. The ballot pamphlet identified this improvement as a jointly funded project with ADOT. In 1992, MAG was notified that ADOT's share of the funding was not available. With the defeat of Proposition 400 in 1994, this corridor was removed from the MAG Freeway/Expressway Plan

In 1998, MAG completed the Grand Avenue Corridor Study. The principal problem identified was delays at the six legged intersections. The Study identified three options for further consideration: (1) "Option 4" - Alternating Grade Separations, (2) "Option 5" - Limited Expressway, and (3) "Option 6" - Full Expressway. The Study recommended that the three options be developed further in a Major Investment Study (MIS), which was completed in September 1999.

The Grand Avenue MIS assessed in detail only two of the options: (1) "Option 4" - Alternating Grade Separations, and (2) "Option 5" - Limited Expressway. The Grand Avenue Steering Committee recommended in the final report that: *"Option 4 with modifications be implemented in the Grand Avenue Corridor. The modifications to Option 4 are to use the Option 5 concept at the 43rd/Camelback intersection and at the 59th/Glendale intersection. This recommendation allows Grand Avenue to be further upgraded to expressway standards by elimination of access and construction of additional grade separations along Grand Avenue as indicated in the MAG Long-Range Plan."*

The MIS concept is for completion by 2006 and the LRTP concept will continue to be a controlled access expressway. As part of the process to accelerate completion of the freeway system, additional bonding commitments will allow completion of eight grade separations along Grand Avenue by 2006. Funding is also committed to complete Grand as a controlled access facility between I-17 and the Agua Fria Freeway within the 20-year planning horizon.

The portion of Grand Avenue from Waddell Road to the Beardsley Canal was widened from two to four lanes in 1990 with MAG 15% funds as a controlled access facility. Access is being controlled as part of local development plans. A corridor study to identify ultimate and near term concepts for the portion of Grand between the Agua Fria Freeway and the Beardsley Canal is underway. Also, a study is underway to review alternative locations for a bypass around the Town of Wickenburg.

Hohokam Expressway (SR 143). The Hohokam Expressway was completed in 1992. Long term improvements on I-10 include an improved connection between the Maricopa Freeway and the Hohokam Expressway.

Pima Freeway (Loop 101). The Pima Freeway is open between the Red Mountain Freeway and Pima Road at Princess Drive. The section between I-17 and Scottsdale Road is under construction and is scheduled for completion in summer 2001. The segment between Scottsdale Road and Pima Road is scheduled for completion in 2003.

Price Parkway (Loop 101). The Price Parkway is being constructed as a freeway facility. The section between the Red Mountain and the Superstition has been open since 1991. The section between the Superstition and Guadalupe Road was opened in 1999 and the segment to Frye Road was opened in December 2000.

Red Mountain Freeway (Loop 202). The Red Mountain Freeway is completed between the I-10 and Country Club Drive. Through financial participation, the City of Mesa has helped accelerate construction from Country Club Drive to Gilbert Road and this segment will be completed in late 2001. The Red Mountain is scheduled for completion by 2007. The Environmental Impact Study was completed in 1999 and advance right-of-way acquisition are underway.

Santan Freeway (Loop 202). The Santan Freeway will extend 24 miles from I-10 to the Superstition Freeway. The first section is scheduled for completion by the end of 2003 and the last section is targeted for completion by 2007. An Environmental Assessment for this corridor has been completed and advance right-of-way acquisitions are underway.

Sky Harbor Facilities. Sky Harbor Boulevard was extended eastward from the Hohokam Expressway to the Red Mountain Freeway in 1992. The Sky Harbor Expressway currently extends southward from Washington Street to University Drive. The section from University Drive to I-10 is scheduled for completion by 2007.

South Mountain Parkway (Loop 202). With the defeat of Proposition 400 in 1994, the ADOT Life Cycle Program designated the South Mountain as a potential tollway. Privatization efforts have not been successful. To address this funding limitation, the 1997 update of the MAG LRTP adjusted the design concept of the South Mountain to that of an expressway that uses planned and existing controlled access roadways.

In 1996, funding was added to the Life Cycle Program to include an interchange between I-10 and Pecos Road as well as an extension of Pecos Road from 19th Avenue around South Mountain to Baseline Road. Through financial participation, the City of Phoenix has helped accelerate the connection between I-10 and Pecos Road to early 2002. Funding for a freeway connection between Baseline Road and the Papago Freeway is included in the LRTP for completion after 2007. Also, the LRTP includes a truck bypass route from the south leg of the South Mountain Parkway to Riggs Road, and continuing eastward to I-10.

Squaw Peak Parkway (SR 51). The section of the Squaw Peak Parkway south of Glendale Avenue was completed by the City of Phoenix, while the section between Glendale Avenue and Bell Road has been completed by ADOT. The Squaw Peak is scheduled for completion by 2003.

FUNDING PLAN FOR NEW FREEWAYS/EXPRESSWAYS

TEA-21 requires MAG to prepare a financial element to implement the MAG LRTP. Financial plans may be based on existing funding sources as well as new funding that can reasonably be expected to be available. The funding plan for new freeways is shown in Figure 7-4.

Funding Sources. The funding plan for new freeways is based on the following committed funding sources and does not require new sources of funding to complete the system. However, acceleration of the freeway system from 2014 to 2007 does require additional bonding.

- Half-cent sales tax funding is from a regional sales tax in Maricopa County. This tax was approved by the voters in October 1985 and is scheduled to expire on December 31, 2005.

- Fifteen percent funding is a portion of ADOT HURF that is allocated for the construction of highways in the Phoenix and Tucson metropolitan areas. Legislative adjustments in 1996 altered this percentage to 12.6 percent without changing the total amount of funds available. An additional 2.6 percent of ADOT HURF is committed by State Transportation Board policy.

- MAG Federal funding refers to funds that MAG is directly allocated and is responsible for programming. These funds are divided into two categories: Surface Transportation Program (STP) and Congestion Mitigation and Air

Quality (CMAQ) funds. Nearly all of MAG STP funds are allocated to freeway construction and a portion of MAG CMAQ funds are used to complete freeway management system projects.

- ADOT discretionary funding includes ADOT HURF and federal funding that can be allocated to projects anywhere in the State.

- Approximately 36 million in funds from Maricopa County to cover improvements to the Estrella.

Costs. Except where noted in Figure 7-4, all costs are based on the most recent ADOT costs as certified in January 2001. Since the last certification, costs have increased because of a detailed review of project costs and increases in right-of-way costs due to development activity.

EXISTING FREEWAYS

In addition to new freeways, the MAG LRTP includes improvements to existing freeways. These improvements include reconstruction / widening of the I-17, I-10 and US 60 corridors and the completion of a system to expedite high occupancy vehicle (HOV) travel.

HOV Plan. In 1994, MAG completed a HOV plan for the region. This concept provides guidelines for improvements to several existing freeway corridors including, I-10, I-17, Squaw Peak and the Superstition. In addition to HOV lanes, the plan includes HOV ramps, park-and-ride lots and on-line bus stations. Concurrently with this Plan update, a revised MAG HOV Plan is being reviewed. If approved by the Regional Council, it will be made a part of the Long Range Transportation Plan.

A MAG study to identify sites for twenty new park and ride lots to support express bus service and car and van pools using the regional HOV system was completed in FY 2001. The MAG Regional Council approved the report and the addition of the recommended lots to the MAG LRTP in January 2001. Ten of the lots are programmed for construction by the end of FY 2006.

Black Canyon Freeway (I-17). In 2000, the reconstruction of the Black Canyon Freeway was completed and HOV lanes are in place between Thomas Road and Dunlap Avenue. HOV lanes are also in place between Dunlap Avenue and Loop 101. Interchanges have been reconstructed at McDowell Road, Thomas Road, Indian School Road, Camelback Road, Bethany Home Road, Glendale Avenue, Northern Avenue and Dunlap Avenue.

The ultimate concept for I-17 includes the addition of ninth and tenth lanes. This concept has been developed in the ADOT report, *I-17 System Design/Operations Study*. The MAG LRTP includes addition of 9th and 10th lanes between Thomas Road and Thunderbird Road. Further study will consider ninth and tenth lanes between Thunderbird Road and Loop 101 and the addition of HOV ramps at the half-mile locations. A study has been initiated by ADOT for I-17

north of Loop 101 to Black Canyon City, as noted below in the section on regional access routes.

Maricopa Freeway (I-10/I-17). The Maricopa Freeway between the Durango curve and Pecos Road was completed between 1963 and 1968. Since that time additional lanes have been added to the facility between 15th Street and Chandler Boulevard. The MAG LRTP includes the addition of collector/distributor roads between 16th Street and Baseline Road. This concept is detailed in the ADOT report, *I-10 Corridor Refinement Study, 16th Street/Buckeye Road to Baseline Road* (May 1988).

With the addition of new lanes to I-10 south of the Superstition, I-10 northbound lanes between the Hohokam and the Superstition have become heavily congested because of complex weaving movements. Accordingly, the first phase of this plan completes the northbound lanes of the collector/distributor system between Baseline Road and 40th Street by 2007.

Papago Freeway. The last section of I-10 in downtown Phoenix was completed in 1990. Additional widening of the Papago Freeway will be studied. Also, study of the feasibility of additional HOV ramps at one-half mile locations is planned.

Figure 7-4: Funding Plan to Complete New Freeways

FREEWAY FUNDING PLAN[a]	FY 2002 to FY 2007[b]	FY 2008 to FY 2021[c]	TOTAL
FREEWAY REVENUE (Millions of Current Dollars) [d]			
Beginning Cash Balance as of July 1, 2001	$244.6	$191.6	$244.6
Sales Tax Funding[e]	$1,413.5	$0.0	$1,413.5
12.6% HURF Funding (existing)[f]	$412.8	$1,541.7	$1,954.5
12.6% HURF Funding (new)	$47.4	$649.3	$696.7
Federal Funding[g]	$232.7	$306.9	$539.6
Freeway Acceleration Funding[o]	$0.0	$0.0	$0.0
ADOT Discretionary[h]	$247.0	$50.0	$297.0
HURF/RARF Bonding[i]	$245.7	$0.0	$245.7
GANs/BFOs/Other Loans[j]	$490.6	$0.0	$490.6
Miscellaneous Income[k]	$145.0	$5.8	$150.8
Total Revenue	$3,479.3	$2,556.3	$6,035.6
EXPENSES AND INFLATION (Millions of Current Dollars)			
Inflation Adjustment[l]	$185.1	$727.2	$912.3
HURF/RARF Debt Service[m]	$1,230.1	$352.0	$1,582.1
Other Loan Repayments[n]	$428.8	$420.0	$848.8
Transit Payment	$34.9	$0.0	$34.9
Miscellaneous Expenses[o]	$7.3	$0.4	$7.7
Total Expenses and Inflation	$1,886.2	$1,499.6	$3,385.8

FREEWAY FUNDING PLAN[a]	FY 2002 to FY 2007[b]	FY 2008 to FY 2021[c]	TOTAL
NET FUNDS AVAILABLE FOR CONSTRUCTION (Millions of 2002 Dollars)	$1,593.1	$1,056.7	$2,649.8
FREEWAY/EXPRESSWAY COSTS (Millions of 2002 Dollars)[p]			
Cost Carry Forward	$305.2	$0.0	$305.2
Agua Fria[q]	$4.0	$0.0	$4.0
Estrella[r]	$11.2	$72.0	$83.2
Grand[s]	$167.2	$352.0	$519.2
Pima	$13.8	$0.0	$13.8
Price	$5.4	$0.0	$5.4
Red Mountain	$270.6	$0.0	$270.6
Santan	$668.8	$0.0	$668.8
Sky Harbor Expressway	$28.5	$0.0	$28.5
South Mountain[t]	$78.7	$653.6	$732.3
Squaw Peak	$2.8	$0.0	$2.8
System Wide	$45.4	$33.8	$79.2
Total Costs	$1,590.4	$1,039.4	$2,629.8
CONTINGENCY (Millions of 2002 Dollars)	$2.7	$17.3	**$17.3**

a. Data in this chart covers the period from July 1, 2001 through June 30, 2021.
b. Data in this column covers the period from July 1, 2001 to June 30, 2007.
c. Data in this column covers the period from July 1, 2007 to June 30, 2021.
d. Funding amounts are based on cash schedules for the Regional Freeway System Program for the July 2001 certification..
e. Proceeds from the sales tax approved by the voters of Maricopa County in October, 1985. The sales tax expires on December 31, 2005.
f. Includes that portion of the State Highway Fund from the Highway User Revenue Fund that is earmarked for controlled access highways in Maricopa County. This includes the 12.6% statutory allocation and the 2.6% that are allocated by State Transportation Board policy.
g. A portion of MAG Federal Funds allocated to the Regional Freeway System.
h. Funds provided through the ADOT Statewide, Five Year Construction Program.
i. Net proceeds from planned HURF and RARF bond issues.
j. Net proceeds from various sources including Grant Anticipation Notes (GANs), Board Funded Obligations (BFO), State Infrastructure Bank (SIB), and loans provided by local jurisdictions.
k. Includes interest income, rental income, income from the sale of surplus property and other miscellaneous sources. Also, includes $56.3 million (current dollars) from Maricopa County for the Estrella
l. Inflation adjustment through 2008 based on the weighted average inflation for right-of-way and construction. After 2008, an annual inflation rate of 4.0 percent was used and reflects funding from Maricopa County ($20.3 million).
m. Debt service on HURF and RARF Bonds issued.
n. Repayment of loans as listed in note j above.
o. Expenses associated with the ADOT Life Cycle Program and miscellaneous expenses.
p. Based on the July 2001 Life Cycle Program for the Regional Freeway Program.
q. Includes $3.5 million to extend the Agua Fria to Maricopa County 85.

r. By 2007 includes the cost to improve the connection with I-10, safety improvements from I-10 to Grand and an overpass at Grand Avenue. By 2021, the cost to extend the route to Maricopa County 85 and to widen the route to a four lane cross section are included. The cost estimate for improvements to the Estrella for the 2002-2007 period are based on the ADOT Five-Year Program. The cost estimate for the 2008-2021 period is preliminary and is not included in the ADOT Life-Cycle Certification. The Maricopa County share of this cost is $36 million (constant 2000 dollars).

s. Includes the cost to upgrade the Grand between Loop 101 and interstate 17 to an expressway.

t. The FY 2008-2021 period includes an additional $629.1 million to complete the facility to I-10 and 24.5 million to construct a truck bypass route in the vicinity of Riggs Road between the Maricopa Freeway and 19th Avenue. The cost estimate for the bypass route is a preliminary cost estimate not included in the ADOT certification.

Squaw Peak Parkway. After HOV lanes on the Superstition, the next highest priority for ADOT discretionary funds in the MAG region is completion of HOV lanes on the Squaw Peak between I-10 and Shea Boulevard. The funding plan includes completion of these lanes (as well as HOV ramp connecting to I-10) by 2007. Funds have been programmed to complete HOV lanes between I-10 and Glendale Avenue. HOV lanes on the Squaw Peak north of Shea Boulevard remain part of the MAG LRTP and are scheduled for completion after 2007.

Superstition Freeway. The first section of the Superstition Freeway was opened to traffic in 1970 and the last section was opened in 1991. The MAG Long Range Transportation Plan includes the addition of HOV lanes between I-10 and the Santan Freeway. Also, additional general purpose lanes are planned between the Price Freeway and Power Road.

Funds have been programmed for completion of HOV lanes between I-10 and Val Vista Drive including an HOV connection to I-10. Also, the City of Mesa has plans to make interest payments to advance the construction of general purpose lanes between the Price Freeway and Val Vista Drive. Improvements to existing interchanges on the Superstition between Mill Avenue and Greenfield Road are scheduled for completion by 2003.

REGIONAL ACCESS ROUTES

Regional access routes provide access in and out of the urbanized area. Some routes are fully access controlled, and access limitations are encouraged on other routes but not always achieved. All regional access routes are on the State Highway system and these routes are part of the Roads of Regional Significance concept added to the MAG LRTP in 1991. Regional highways are shown in Figure 7-1.

I-10 South. The *ADOT I-10 Phoenix/Tucson Corridor Profile Analysis Study* was completed in July 1999. Preparation of a design concept report and environmental assessment for the section between Maricopa Road and I-8 is underway. A study of collector-distributor roads for the section of I-10 between Baseline Road and 16th Street is planned.

In the MAG area, I-10 is currently eight lanes north of Chandler Boulevard and 4 lanes to the south. This LRTP includes widening I-10 between Chandler Boulevard and Riggs Road to six lanes. Additional widening is the subject of further consideration and funding availability. A study for the widening for I-10 south of the Maricopa Road TI is currently underway by ADOT.

I-10 West. ADOT is studying I-10 west of Phoenix in the study, I-10/B-10 Multimodal Corridor Profile. No recommendations are available at this time.

I-17 North. ADOT has completed a corridor profile study titled, *Phoenix-Flagstaff-Page Corridor Profile Study* (ADOT, August 1998), which includes I-17 north of Loop 101. The profile study develops a long range vision for I-17 that includes widening the facility to an eight to ten lane cross section between the Agua Fria Freeway and New River. Two of the lanes that would be added would be for HOV only. A Design Concept Report and environmental

overview for the section of I-17 between Loop 101 and Black Canyon City were initiated by ADOT in late 1999.

This LRTP update includes widening I-17 from four to six lanes between Loop 101 and the Carefree Highway. Additional widening is not part of this plan and would be subject to further consideration and the availability of funding.

US 60 East. The Superstition Freeway transitions into a four lane highway in Apache Junction. Access control issues along this highway are being addressed in the ADOT report, *Apache Junction to Forest Boundary*. Improvements to this highway are not included in the MAG LRTP because it is beyond the boundaries of the MAG area.

US 60 Northwest. The facility extends northwest from the Estrella corridor (Loop 303). Funds are programmed to complete the widening of this facility to four lanes from the Beardsley Canal to Morristown. The portion of US 60 between Morristown and Wickenburg has been four lanes for decades. ADOT is conducting a design concept study from Morristown to the Santa Maria River that includes the examination of a potential bypass route around Wickenburg. Addition of a bypass route to the MAG LRTP is subject to further study and the availability of funding. Funding for the design and construction of an interim bypass has been programmed.

SR 74. State Route 74 is a two-lane, major east-west facility approximately 20 miles north of central Phoenix, falling within the cities of Peoria, Phoenix, as well as Maricopa County. It provides an important link between two statewide highway corridors (US 60 and I-17) and also serves as an important element of the regional transportation system.

It provides access in and out of the region, serves the extensive recreational facilities at Lake Pleasant and lies in an area that will be increasingly attractive to future development. SR 74 was recently realigned in the area of Lake Pleasant Road to establish SR 74 as the through facility. ADOT is leading an access control study of the facility with local governments.

SR 85. ADOT has completed a design study of SR 85 from I-10 to Gila Bend that includes an ultimate concept to upgrade the facility to freeway standards. This Long Range Transportation Plan update includes widening this facility from two to four lanes. The ultimate concept of a full controlled access freeway is beyond the 20 year horizon of this plan.

This facility is designated as a bypass route as part of regional air quality plans. Current attention is focused on incremental improvements to SR 85. The Five Year Program includes funds for the widening the facility to four lanes from I-10 to approximately three miles north of Gila Bend.

CANAMEX Corridor. MAG and ADOT initiated a study in FY 2000 to designate a route for the CANAMEX Corridor. The CANAMEX Corridor, which will run from Canada to Mexico, is one of forty-three national corridors that were identified in ISTEA, the 1995 National Highway System Designation Act and TEA-21 as high priority corridors.

Section 1105 of the National Highway System Designation Act specifies the CANAMEX Corridor to run from "Nogales, Arizona, through Las Vegas, Nevada, to Salt Lake City, Utah, to Idaho Falls, Idaho, to Montana, to the Canadian Border". In the State of Arizona, the CANAMEX Corridor generally follows "(i) I-19 from Nogales to Tucson; (ii) I-10 from Tucson to Phoenix; and (iii) United States Route 93 in the vicinity of Phoenix to the Nevada Border".

In April 2001, the MAG Regional Council passed a resolution specifying the corridor to include I-8, SR-85, I-10, an alignment in the general vicinity of Wickenburg Road/Vulture Mine Road, connecting to the future Wickenburg bypass, and including the bypass from that point west to US-93. The resolution and map showing the corridor are contained in Appendix E.

SR 87 Northeast. Major reconstruction of SR 87 between Phoenix and Payson is being completed. Most of the facility has been widened from two lanes to four lanes. Related final widening improvements are part of this LRTP.

FUNDING PLAN FOR EXISTING FACILITIES

The funding plan for existing freeways and regional access routes is based on trend and fair share concepts. Costs are based on the most recent available information from ADOT.

Costs. Costs for all planned improvements to existing freeways are detailed in related studies as previously noted. All costs have been updated for inflation. In addition, costs on I-17 have been decreased to exclude the cost of recent improvements.

Countywide costs in the funding plan are based on the ADOT five-year program and operating program and projected on a per mile basis. These costs include system preservation, interchange and FMS improvements not specifically identified in the funding plan, enhancement programs, minor district projects, air quality contingency and a share of overhead costs necessary to administer the state highway system.

Funds. Existing freeways and regional access routes are state highways. Accordingly, the funding sources for improvements to these facilities is ADOT discretionary funds, i.e. state and federal transportation revenues that ADOT can spend anywhere in the state. The amount of ADOT discretionary funds available for projects in this region is based on a fair share funding concept. The fair share concept is based upon the premise that transportation revenues generated in the region will be largely returned to the region for transportation projects.

A major portion of ADOT discretionary funds is based on federal and state gasoline taxes. These taxes are fixed rates per gallon of gasoline which results in declining revenue because of inflation and more fuel efficient vehicles. To address this issue a new statewide tax equivalent to a 10 cent per gallon fuel tax increase phased in over 2004 through 2012 is assumed. Inflation indexing of all fuel taxes is assumed after 2004. This tax is assumed to

be distributed according to currently adopted formulas for HURF and the resulting increase in ADOT discretionary funding is assumed to be allocated on a fair share basis.

A major portion of MAG federal funds have been committed to complete new freeways under this funding plan. MAG federal funds are not committed to improve existing facilities. MAG 15 percent funds (actually 12.6 percent by statute and 2.6 percent by State Transportation Board policy) are committed to new freeways. It is assumed that after 2007 that MAG 15% and Federal funds (or equivalent funding levels) will be needed to provide debt service.

Figure 7-5: Funding Plan to Complete Improvements to Existing Freeways and Access Routes (Millions of 2001 Dollars)[1]

	FY 2002 to FY 2007	FY 2008 to FY 2021	Total
FUNDS			
ADOT Operating Funds[2]	$830.5	$1,862.1	$2,692.6
ADOT Discretionary[3]	$1,329.9	$2,675.9	$4,005.8
Private Funds	$24.0	$0.0	$24.0
New Funding[4]	$117.1	$676.6	$793.7
Total	$2,301.5	$5,214.6	$7,516.1
COSTS: EXISTING FREEWAYS			
Black Canyon, Maricopa to Pima Freeway	$19.7	$642.9	$662.6
Maricopa, Black Canyon to Santan Frwy	$131.4	$132.9	$264.3
Squaw Peak, I-10 to Pima Freeway	$61.4	$24.0	$85.4
Superstition, I-10 to the Santan Freeway	$296.6	$111.7	$408.3
Subtotal	$509.1	$911.5	$1,420.6
COSTS: REGIONAL ACCESS ROUTES			
I-10 South of the Santan Freeway	$2.0	$48.8	$50.8
I-10 West of the Agua Fria Freeway	$17.6	$0.0	$17.6
I-17 North of the Agua Fria Freeway	$26.8	$80.0	$106.8
US 60 East of the Red Mountain Freeway	$0.0	$0.0	$0.0
US 60 Northwest of the Agua Fria Frwy	$20.8	$0.0	$20.8
SR 85 South of I-10	$71.9	$73.1	$145.0
SR 87 Northeast of Shea Boulevard	$0.0	$0.0	$0.0
Subtotal	$139.1	$201.9	$341.0
COSTS: SYSTEMWIDE[5]	$1,556.8	$3,035.8	$4,592.6
TOTAL COSTS	$2,205.0	$4,149.2	$6,354.2
CONTINGENCY[6]	**$107.9**	**$1,065.4**	**$1,173.3**

1. See Appendix D for more detailed documentation.

2. A share of Highway User Revenue Funds used to fund ADOT administration, operations and maintenance for the MAG area.

3. Share of ADOT Five-Year Program allocated to the MAG region.

4. Assumes fuel tax increases of 1 cent per gallon in 2004, 2 cents in 2005, 3 cents in 2008, and 4 cents in 2012. It is also assumed that the fuel tax would be indexed to inflation. The amount allocated is proportional to the MAG region tax contributions (approximately 38 percent of the ADOT share of the new revenue source).

5. Includes operating, maintenance, administration and minor capital projects needed to maintain the system that do not add through lane capacity such as pavement preservation, landscaping improvements on existing sections, safety projects and other miscellaneous projects. The minor capital cost category is based on projects listed in the MAG TIP and a share of the statewide lump sum category listed in the ADOT Five-Year Program.

6. These funds serve as contingency funds for all regional routes as well as arterial streets. In addition, there may be a need for numerous improvements to the state highway system that are now under study and are not included in the Plan.

SECTION 8

PEDESTRIANS

INTRODUCTION

The Phoenix metropolitan area is one of the largest in the United States with a 2000 population of 3.3 million distributed over approximately 1,000 square miles. Due to the low density, land use uniformity, and geographic extent of the metropolitan area, the motor vehicle is the predominant mode of transportation in the Valley. Traffic congestion is a daily feature of the major roadways and its impacts to the metropolitan community are extensive. As the metropolitan area continues to expand and traffic congestion increases, the Maricopa Association of Governments (MAG) and its members agencies are seeking ways to better serve the mobility needs of the region's population, industry and visitors. A greater focus on multi-modal solutions is occurring with numerous initiatives underway to better use the existing transportation infrastructure.

Simultaneously, the region's tremendous growth has given the community a greater appreciation for the way pedestrian facilities help create a sense of community while broadening the transportation choices of the region's residents and visitors. As a result, there are now a number of high-quality pedestrian facilities in a variety of settings. The MAG Region has a topography that is conducive to walking and for a significant part of the year walking is pleasant. However, to a large extent, the existing transportation system provides minimal accommodation. While the vast majority of roadways with significant traffic have sidewalks, many sidewalks are located immediately adjacent to motor vehicle travel lanes carrying significant volumes of high speed traffic resulting in uninviting walking conditions.

REGIONAL ROLE IN CREATING PEDESTRIAN AREAS

On June 9, 1998, President Clinton signed into law the Transportation Equity Act for the 21st Century. This legislation has numerous provisions which relate to improving conditions for bicycling and walking, and improving safety of the two modes. TEA-21 confirms and continues the principle established in the Intermodal Surface Transportation Efficiency Act (ISTEA): planning and giving "due consideration" of pedestrian travel needs is to be given during the planning, developing, and construction of all Federal-aid transportation projects.

> "Due consideration" of bicycle and pedestrian needs should include, at a minimum, a presumption that bicyclists and pedestrians will be accommodated in the design of new and improved transportation facilities. In the planning, design, and operation of transportation facilities, bicyclists and pedestrians should be included as a matter of routine, and the decision to not accommodate them should be the exception rather than the rule...Maintaining access to the

transportation system for nonmotorized users is not an optional activity (FHWA Guidance on Bicycle and Pedestrian Provisions of Federal Transportation Legislation).

MAG is a leader in promoting improvement in the Valley's streetside environments to better accommodate pedestrian travel. Past pedestrian planning efforts conducted by MAG and its member agencies have led to a variety of pedestrian-oriented policies, programs and roadway improvements. In 1993, MAG developed a plan which identified policies to encourage walking, and suggested areas where these policies might be best implemented. In 1994, MAG formed the Pedestrian Working Group to promote increased awareness of walking as an alternative mode of travel and to improve facilities for people who walk. A survey of pedestrian needs was conducted among residents which provided the basis for the development of the 1995 *Pedestrian Area Policies and Design Guidelines*. This document is incorporated by reference into this plan, and enhanced the adopted 1993 *Pedestrian Plan*, identifies types of pedestrian areas commonly found in the MAG region, and proposes policies and design elements to promote walking. The *Policies and Guidelines* is intended for use by professional planners, engineers and MAG member agencies. In 1995, the Walking and Bicycling into the 21st Century Conference Series was initiated. The series is attended by planners, engineers, design professionals and pedestrian advocates statewide. Since 1996, MAG has provided $270,000 of Design Assistance to develop pedestrian plans and limited construction documents for six areas in the region. This program has leveraged more than $3 million of investment in pedestrian facilities.

MAG PEDESTRIAN PLAN 2000

Since the pedestrian plan had not been updated since 1993, and since numerous programs and actions had been implemented by the MAG Pedestrian Working Group, the Regional Council adopted a work program in 1998 which specifically directed the production of a plan update. The purpose of the *Pedestrian Plan 2000* is to identify and recommend programs and actions that guide and encourage the development of pedestrian areas and facilities and ultimately increase walking as a viable mode of transportation throughout the region. The update incorporates a unique approach: flexible design tools (Roadside Performance Guidelines) to assist MAG member agencies in creating better walking environments within the existing or new roadway network. A stakeholders group was directly involved in the development of the plan update, which was overseen by the Pedestrian Working Group, and adopted by the MAG Regional Council on December 8, 1999. The major elements of the plan are summarized below.

Plan Goals and Objectives. The plan contains five goals addressing areas vital to creating a mode shift away from driving and towards pedestrians. Each goal has several objectives, and each objective is linked to the action plan. The five goals are listed below, and the objectives are provided in the *Pedestrian Plan 2000.* The five goals are:

- **Goal I: Land Use** — Promote and guide land use that is conducive to pedestrians and results in a mode shift away from automobiles and towards pedestrians.

- **Goal II: Public Awareness** — Develop a variety of educational programs to promote the benefits of pedestrian-oriented design. Initiate demonstration project to illustrate these benefits using potential pedestrian demand and pedestrian design techniques.

- **Goal III: Funding** — Provide funding for pedestrian facility development that results in walking as a key form of transportation in the region.

- **Goal IV: Design for People** — Develop, build and maintain a diversity of pedestrian facilities that recognize the region's character, variety and intensity of land use patterns, and is responsive to the region's diverse population.

- **Goal V: Linkage** — Provide a regional pedestrian network that identifies and safely links on-and off-street transportation modes with pedestrian areas and destinations.

The Roadway Design Performance Guidelines. One of the major regional initiatives reflected throughout the goals and objectives of the *Pedestrian Plan 2000* is to establish performance guidelines for pedestrian facilities within road right-of-ways. Establishing regionwide performance guidelines, as opposed to rigid roadway cross-sections, gives design flexibility to MAG member agencies. Providing this flexibility within performance guidelines, as opposed to prescriptive cross-sectional standards, will ensure that roadways will meet the needs of other travel modes while simultaneously encouraging pedestrian travel throughout the MAG region. The Maricopa Association of Governments recognizes that its members have unique goals, challenges, and constraints with respect to their transportation networks and right-of-ways. Accordingly, roadway performance guidelines are the best way to achieve these regional goals. Details of the creation of the guidelines are described in the *Pedestrian Plan 2000* and its accompanying Technical Appendix.

Following a decision to incorporate a sidewalk in a roadway design, perhaps the single most important design consideration is determining the appropriate amount and type of lateral separation and buffering between the sidewalk and the motor vehicle travel lanes. Mentioned in the *Pedestrian Area Policies and Design Guidelines*, the appropriate amount and type of separation and buffering depends on traffic and geometric conditions — simple cross-

sections standards do not allow roadway designers the flexibility to provide the target quality walking environment, particularly with regard to the sense of safety or comfort afforded to pedestrians. While the *Pedestrian Area Policies and Design Guidelines* can be referenced for shade canopy and other pedestrian facility environment aspects, the *Pedestrian Plan 2000* focused on guidelines for lateral separation and buffering.

The format of these performance guidelines allows roadway designers to consider a variety of design options in achieving the minimum walking environment quality according to the roadway's classification of potential pedestrian activity level. These performance thresholds establish that roadways within areas with the highest potential to serve pedestrian trip activity (or a mode shift) in the MAG region should provide the highest quality walking environment with respect to pedestrians' sense of safety. The tables included in the *Pedestrian Plan 2000* were developed using the Roadside Pedestrian Conditions Model to determine the roadway cross-sectional geometry necessary to meet these performance standards. These tables provide planners and engineers with design information to achieve the performance guidelines for roadways. One table has been created for each pedestrian area type as identified in the *Pedestrian Area Policies and Design Guidelines*: District, Campus, Community and Neighborhood.

In many cases, there will not be sufficient right-of-way width to provide the recommended unbuffered area between the sidewalk and roadway. For these reasons, or aesthetic considerations, the roadway designer may choose other methods to achieve the same level of service for pedestrians, but with a reduced lateral separation, or buffer width. There are numerous alternatives to reduce buffer width depending on the roadway, traffic, and adjoining land use conditions, such as providing on-street parking, bicycle lanes or undesignated shoulders, vertical barriers, or street trees and landscaped buffers.

The *Pedestrian Plan 2000* includes a table of alternative buffer widths which can be provided if street trees are used to reduce the unadjusted lateral separation between the sidewalk and the roadway. This table reflects the positive effect of tree spacing on the pedestrians' sense of safety with respect to motor vehicle traffic. This table was derived using the Roadside Pedestrian Conditions Model in conjunction with direct observations and roadway evaluations throughout the MAG region.

While providing appropriate roadside pedestrian conditions is an important ingredient in improving the regional pedestrian environment, other parts of the pedestrian transportation system must be enhanced as well to achieve the overall objectives of MAG. These include:

- meeting ADA accessibility standards;
- improving pedestrian accommodation and safety at intersections and mid-block crossings ; and
- providing the shade canopy and street furniture and other pedestrian travel amenities covered in the 1995 *Pedestrian Area Policies and Design*

Guidelines and applicable local, state and national roadway and traffic design guidelines.

Objectives such as these, along with minimizing pedestrian-vehicle conflicts and street crossing distances at intersections are integral to the overall improvement in the Region and should be pursued with equal vigor as improving the roadside walking environment.

Action Plan. The full text of the adopted action plan, which links to the goals and objectives of the plan, is included in the *Pedestrian Plan 2000.* As a way to implement the action plan adopted by Regional Council, the Pedestrian Working Group will be pursuing the following activities in the next year:

- Work with the Regional Bicycle Task Force to develop a regional plan of off-street pathways for non-motorized transportation.

- Work with Valley Metro as they develop pedestrian-oriented design ordinances. These guidelines will help integrate progressive pedestrian facility design principles into the regions' transportation infrastructure.

- Continue efforts to educate planners, engineers, design professionals and advocates of walking through the Walking and Bicycling into the 21st Century series.

- Continue to fund the Pedestrian Design Assistance Program for the planning and design of pedestrian facilities which demonstrate design principles that support walking.

- Identify new opportunities to further integrate progressive pedestrian facility design principles into the region's transportation infrastructure.

FINANCIAL PLAN

In most cases pedestrian facility improvements are completed as part of projects involving street, bicycle, safety or other facility improvements. Except for those projects listed as bicycle improvements, the cost of all of these improvements are included in the Street Section of the Long Range Transportation Plan. Pedestrian facility projects associated with bicycle projects are accounted for in the Bicycle Section.

Additional pedestrian improvements associated with the development process and member agency projects that are not reflected in the TIP are also accounted for in the Street Section. Member agencies do not need to include projects that are not regionally significant or federally funded in the TIP.

The Long Range Transportation Plan (LRTP) assumes that funding for projects that are identified as pedestrian projects will continue as a constant share of available funding sources as identified in the MAG FY 2002-2006 Transportation Improvement Program (TIP). For the 2002-2012 federal funding consist primarily of congestion mitigation and air quality (CMAQ) fund. After 2012, surface transportation program (STP) funds become available due to the retirement of outstanding debt for new freeway construction. This additional funding is allocated to pedestrian projects based on the share used to allocate CMAQ funding. The following table shows in constant 2000 dollars funding allocated to pedestrian projects in the LRTP.

	Federal	Local	Total
● 2002-2012	$ 15	$ 24	$ 39
● 2011-2021	$ 22	$ 27	$ 49
Subtotal	$ 37	$ 51	$ 88

SECTION 9

STREETS

The MAG Regional Street Plan incorporates MAG member agency street plans. These plans include arterial streets, non access controlled State highways and non arterial streets that provide access to residents and properties. To facilitate a system of high mobility roadways, MAG has adopted a Roads of Regional Significance Concept. The Plan also includes a financial component that identifies costs and funding for the Street Plan.

PLAN ELEMENTS

Arterial Street System. The arterial street system consists primarily of paved roadways with four or more lanes on a mile grid system in the Valley. It is anticipated that this system will expand by a combination of new roadway construction, the paving of dirt roads on the mile grid system and by the widening of existing arterial streets. Currently there are 8,712 lane miles of arterial street. By 2021, it is anticipated that there will be a 45 percent increase in the number of arterial street lane miles.

Information on planned arterial street improvements is updated by surveying MAG member agencies every two to three years. The most recent survey was performed in the summer of 1997 and the results are incorporated into this Update to extend the planning horizon to 2021. This survey information is incorporated into the MAG modeling networks and used for all planning purposes (see Section 4 for a description of the MAG travel demand model process). These modeling networks define the arterial street element of the MAG Regional Street Plan.

Non Arterial Street System. The non arterial street system includes all local and collector streets. Its primary function is to provide access to businesses and residences. This system is constructed largely as part of the development process. As development occurs on the urban fringe, unpaved rural roadways are paved and new paved local roadways are constructed to provide for local access. Local and collector streets represent approximately 75 percent of the street mileage, but carry only a small share of all traffic. The growth in local street mileage is closely associated with the growth in population and employment.

Operation, Maintenance and Improvements of Streets. MAG member agencies seek to maintain and operate the street system at its current level of service. To achieve this goal, member agencies currently spend approximately $280 million per year or two-thirds of the local and state money they receive on street lighting, street sweeping, landscaping, sign maintenance, minor pavement maintenance, the operation of traffic signals and other recurring costs necessary to maintain the street system. By 2021, it is anticipated that approximately $400 million per year will be spent on street maintenance and operations.

In addition to routine street operations and maintenance, it will be necessary to improve and reconstruct elements of the existing system due to increased traffic flows from increasing population and employment densities, design flaws in initial street construction, changes in design standards, pavement deterioration, and other factors. Approximately $2.4 billion will need to be expended on pavement reconstruction, paving streets that were bypassed in the development process, traffic controls, turn lanes, landscaping and various other improvements.

New Street Construction and Widening. Most new street construction occurs as a part of the development process. It is assumed in the Plan that all new local streets are constructed with private funding and capitalized in the cost of new housing. The private cost of constructing these new streets could be as high as $7.8 billion over the life span of the Plan.

In addition, new arterial streets will need to be constructed to serve new development and existing streets will have to be widened to serve increased traffic demand. It is anticipated that new street construction will be paid for primarily from private sources and that street widening will be paid for by public sources. Over the life of the plan, it is expected that approximately $3.4 billion in public and private money will be spent on new arterial street construction and widening.

DUST CONTROL MEASURES

The MAG Long Range Transportation Plan incorporates funding for measures to control dust from auto travel and these are reflected in the street funding plan. It is anticipated that local governments will be replacing their older broom street sweepers with PM-10 efficient street sweepers which reduce fugitive dust. In the 2002-06 MAG TIP, $7.2 million has been programmed for the purchase of PM-10 efficient street sweepers. Efforts are also currently underway by local jurisdictions to pave dirt roads. It is projected that these control measures will continue to be implemented beyond the PM-10 attainment date of December 31, 2006.

In the MAG Long Range Transportation Plan the paving of dirt roads reflects a continuation of current commitments and includes paving of dirt roads due to increased traffic volumes (i.e., exceeding 150 ADT), elimination of dirt roads in areas of new development, and acceleration of the paving of dirt roads to maintain air quality standards. The costs and funding for these long-term dust control measures are reflected in the financial plan of the MAG Long Range Transportation Plan and include paving at least ten centerline miles of unpaved roads per year beginning in FY 07.

FINANCIAL PLAN

The financial plan for streets is based on the MAG Transportation Improvement Program and the capital and operating budgets of MAG member agencies. Operating and maintenance

costs and the cost of reconstruction and major improvements to existing streets is funded primarily through public sources. The cost to construct new local streets is funded primarily from private sources. It is assumed in this analysis that funding levels increase with population in accord with a trend funding concept as outlined in Appendix C.[1] A funding plan for the region is shown in Figure 9-1.

Federal Funding. Several sources of federal funds are available to local governments. These sources include two categories of funds from the Transportation Equity Act for the 21st Century (TEA-21): the Surface Transportation Program (STP) and the Congestion Mitigation and Air Quality (CMAQ) Program. Also included are Community Development Block Grants (CDBG) from the Federal Office of Housing and Urban Development.

The allocation of TEA-21 funding for street projects is based on MAG policies and results of the MAG Transportation Management Systems. After 2012, it is anticipated that the debt service requirements for planned freeways will have been retired and that MAG STP funds will be allocated to street projects in the same proportion as CMAQ funding is currently distributed between Travel Demand (TDM), street, bicycle and pedestrian projects. Overall approximately 2 percent of all street funds are projected to come from federal sources.

Highway User Revenue Funds. HURF is a collection of statewide revenue sources including fuel taxes, the vehicle licence tax and various transportation fees and taxes. HURF is dedicated for the improvement, maintenance and operation of roadways and is distributed by statutory formula to the Arizona Department of Transportation (ADOT) and the counties, cities and towns of Arizona. HURF is the principal public source of funding for street improvements.

Local Funding. Local funds are obtained from property taxes, special improvement districts, sales taxes or other locally generated taxes and fees.

Local Transportation Assistance Fund (LTAF). LTAF funds are derived from the State Lottery and are distributed to all Arizona cities, towns and counties for improving transportation facilities and services.

Private Funding. When new residential and commercial development occurs, private funds are often used to construct major street projects. This funding may be negotiated as part of the zoning process or it may be derived from developer fees. Private funds are also used to construct local roads within new developments. These funds are the primary source for new street construction.

New Funding. Without periodic adjustment for inflation, HURF revenue collections on a real dollar per capita basis will not be sufficient to address street transportation needs as HURF collections are adversely impacted by inflation and increasing vehicle fuel efficiency. Thus between 1985 and 2000, each penny of fuel tax lost 37 percent of its purchasing power due

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[1] A 3.5 percent inflation rate is assumed.

to inflation alone[2].

To address this problem and to make up for declines in constant dollar per capita revenue collections since the last HURF tax increase, the plan includes a new tax equivalent to a one time increase of ten cents per gallon on fuel by 2002 and annual adjustment of fuel tax rates to account for inflation thereafter. By 2021, it is anticipated that these adjustments would make approximately $2.8 billion in new revenue available for street projects in the MAG area.

ROADS OF REGIONAL SIGNIFICANCE CONCEPT

The Roads of Regional Significance (RRS) Concept and design guidelines were adopted by the MAG Regional Council in the spring of 1991. Further analysis of this concept was completed in January 1996. The concept is a system of upgraded streets and roads to improve mobility in the urban areas, as well as into and out of the region. This concept is intended to facilitate coordination of street plans. This concept is not part of the Regional Street Plan or the Street Funding Plan.

The adopted Roads of Regional Significance (RRS) Concept includes urban and gateway routes. Urban routes are designed to complement the freeway system and are three to six miles apart. The concept facilitates the development of a system of routes with higher design standards and higher speeds that will help ensure regional mobility. Gateway routes provide access to the region and need to be protected to maintain free flow access into and out of the region. As gateway routes consist largely of rural highways, these routes are described in Section 7 – Freeways/Expressways (see Regional Access Routes).

[2] Based on the consumer price index.

Figure 9-1
Street Financial Plan
(Millions of 2000 Dollars)

	2002-2011	2012-2021	Total
COST ESTIMATES[1]			
O&M[2]			
Non Arterial Streets	372	421	793
Arterial Streets	1,963	2,153	4,116
Subtotal	2,335	2,574	4,909
Improvements[3]	1,203	1,321	2,524
New Construction[4]			
Non Arterial Streets	4,052	3,941	7,993
Arterial Streets	1,542	1,868	3,410
Subtotal	5,594	5,809	11,403
Total Cost	9,132	9,704	18,836
COMMITTED REVENUE ESTIMATES			
MAG STP[5]	16	101	117
CMAQ[6]	153	71	224
Safety & Enhancement Funds[7]	37	30	67
Subtotal	206	202	408
Highway User Revenue Fund[8]	2,389	3,443	5,832
LTAF[9]	46	35	81
Local Sources[10]	423	387	810
Private Sources[11]	4,391	5,413	9,804
Total Committed Funds	7,455	9,480	16,935
NEW REVENUE SOURCES			
New Statewide Revenue - MAG Share[12]	347	1,822	2,169
CONTINGENCY	(1,330)	1,598	268

ENDNOTES

1. Cost estimates are based on mileage estimates developed above and unit cost derived from previous MAG Transportation Improvement Programs and a sample of street department budgets of MAG member agencies.

2. O&M Costs include the cost to maintain and operate the street system. These costs include street lighting, street sweeping, minor street repairs, overhead costs, traffic signal operations, sign repairs and a variety of other ongoing programs. The allocation of costs between arterial and non arterial streets is based on the share of traffic they carry.

3. This category includes improvements to streets that do not add new thru lane capacity. Example improvements include traffic signal improvements, landscaping improvements, left and right turn lanes, major pavement reconstruction, paving dirt roads and bicycle lanes and sidewalks projects completed as part of a larger street project.

4. This category includes new street construction and reconstruction of existing streets that add new thru lane capacity and all associated construction including: bicycle facilities, sidewalks, landscaping and other improvements. The majority of projects in this category involve the construction of local subdivision streets and arterial streets on the urban fringe.

5. Includes only federal Surface Transportation Program (STP) funds allocated to MAG per the Transportation Equity Act for the 21st Century (TEA-21) and outside urban STP funds allocated to MAG. Amounts for the FY 2001-2007 period are the same as used in developing the MAG Transportation Improvement Program. The amounts after 2007 are projected based on increases in population. An obligation authority level ranging from 87 percent to 90 percent is used in the forecast. Only amounts allocated for street projects have been included.

6. This category includes only federal Congestion Mitigation and Air Quality (CMAQ) that is used for street projects. It is assumed that all CMAQ funding is allocated to MAG and that this funding is continues beyond the expiration date of TEA-21. Amounts for the FY 2001-2007 period are the same as used in developing the MAG Transportation Improvement Program. The amounts after 2007 are projected based on increases in population. An obligation authority level ranging from 87 percent to 90 percent is used in the forecast. Only amounts allocated for street projects have been included.

7. This category includes a 25 percent share of federal safety and enhancement funding that is allocated to ADOT per TEA-21. ADOT distributes approximately 50 percent of safety and enhancement funding to local agencies and it is assumed that local agencies in the MAG area will receive approximately 50 percent of this local distribution of funding or an amount roughly proportional to their share of statewide population. This funding source is projected at a 87 to 90 percent obligation level on a current dollar per capita basis from amounts listed in TEA-21. Only amounts allocated for street projects have been included.

8. The Highway User Revenue Fund is the primary Statewide public source for funding transportation projects. No changes in tax rates or distribution formulas are assumed in this projection. Through 2020 the projection is based on the November 2000 ADOT planning forecast, thereafter it is based on a per capita trend using the ADOT forecast. Local agency debt service has been deducted.

9. The Local Transportation Assistance Fund (LTAF) is allocated on a statewide basis for transportation projects. This projection assumes no changes in rates or distribution formulas and excludes revenue allocated for transit projects.

10. This category includes local agency property tax, sales tax, enterprise fund and other general fund revenues. This revenue source is projected on a constant dollar per capita basis from data contained in the MAG Transportation Improvement Program.

11. This funding source is primarily associated with new thru lane capacity as result of development activity. Based on mileage data in the MAG Transportation Improvement Program, it is assumed that 50 percent of all new thru lane capacity on arterial streets will be privately funded. All non arterial street thru lane capacity improvements are assumed to result from the construction of new subdivisions so it is assumed that they will be privately funded. This funding may take the form of either in-kind dedications and development impact fees.

12. It is assumed that a new statewide tax equivalent to a 10 cent increase in HURF fuel taxes and an indexing of HURF fuel taxes thereafter would be phased in over the 2004-2012 period (3-cents in 2004, 3-cents in 2008 and 4-cents in 2012) and that the distribution of this tax would be the same as HURF fuel taxes.

SECTION 10

TRANSIT

This section documents the transit element of the MAG Long Range Transportation Plan (LRTP). This Plan calls for tripling local bus service to provide general mobility throughout the region, expanding express bus service to connect outlying areas to central activity centers, expanding dial-a-ride service to meet paratransit transportation needs and a light rail transit system to meet the travel needs of central activity areas. This LRTP also incorporates the Short Range Transit Plan and Regional Americans with Disabilities Act Complementary Paratransit Plan. The following text describes these Plans and the related long range funding plan.

SHORT RANGE TRANSIT REPORT

The MAG Short Range Transit Report is prepared annually by the Regional Public Transportation Authority (RPTA) and creates a forum for coordinating regional public transportation programs. The most recent Short Range Transit Report, FY 2001 through 2005, details the status of scheduled transit service including a mission statement, goals, service standards and system performance indicators. Also included is a detailed illustration of the Capital Improvement Program and Transit Improvement Program projects in each fiscal year. Funding levels and sources for the past year are reviewed and potential revenue sources are projected. Service and capital improvements are proposed for the five-year horizon and designed with flexibility in order to respond to changing economic conditions.

LONG RANGE TRANSIT PLAN

An extensive update of the Regional Long Range Transit Plan was completed as part of the 1999 Update. Local transit funding initiatives have been undertaken since that time and future revisions to the transit plan may be needed.

Local Fixed Route Bus Service. Fixed route bus service generally follows the mile grid street system of the Phoenix metropolitan area. The revised transit plan calls for a doubling of revenue miles of service by 2010 and nearly a tripling of revenue miles of service by 2020. The concept also includes funding for maintenance facilities, upgrades and expansion of vehicles and passenger facilities, and customer service activities. Other features include:

- Service is provided 19 hours daily Monday through Saturday.
- Service is provided 14 hours daily, Sundays and holidays.
- Most buses operate at 30 minute headways during peak and off-peak periods.

- High demand routes have 15 minute peak service, while low demand routes have 60 minute off-peak service.
- Service frequencies on weekends and holidays are approximately half the level of midday off-peak service.

Implementation of this plan will result in adjusted route frequencies by time of day and service demand. Local transit plans will be incorporated as part of this effort. Figure 10-1 shows areas for fixed route service.

Paratransit Services. Two types of paratransit service are included in the Long Range Transit Plan: Dial-a-Ride and ADA Complementary Paratransit Service. Dial-a-Ride is characterized by the lack of a pre-determined route or schedule. Callers can request service when ready to travel or through advance reservation. Dial-a-Ride is typically provided for specific groups of persons, such as seniors or persons with disabilities, or for the general public in areas without fixed route bus service.

The transit provision of the Americans with Disabilities Act (ADA) requires that whenever and wherever local buses operate, a parallel service be provided for persons with disabilities who are unable, because of their disability, to access or use fixed route bus service. In this region, ADA complementary paratransit service, commonly referred to as ADA service, must be provided in all areas within three-fourths of a mile of fixed route bus service.

Since 1992, the Long Range Transportation Plan has supported tripling paratransit service. This plan remains intact with service doubling by 2010 and tripling by 2020. Because current service is provided by ten different systems, several outstanding operations issues are being addressed, including:

- One number to call for service.
- Uniform fares and fare instruments.
- Uniform service policies.
- Uniform service hours and days.
- Limited or no transfers when crossing municipal boundaries.
- Uniform vehicle and driver identity.

Express and Commuter Bus. The express bus system serves to connect outer portions of the urbanized area to central activity centers. The planned express service is focused on meeting peak-period demand. Service would be provided six hours per day (three hours in the morning and three hours in the evening) with a frequency of 15 minutes. Implementing this plan will result in adjustments to frequencies and hours of service on individual routes based on customer needs.

The planned system more than doubles the miles of express service by 2010, and by 2020

the service is nearly quadrupled. In general, express bus service is not provided in areas served by light rail and is enhanced in areas without planned light rail service. Express bus service extends to outlying communities such as Carefree and Cave Creek. Commuter bus service would provide peak period service on weekdays to the communities of Buckeye, Gila Bend and Wickenburg. Other features of the system include:

- Service is generally restricted to freeways with the potential for limited circulation for access to activity centers, park-and-ride lots and local route/shuttle connections. Exceptions to operation on freeways include service in the Sun City area, the Cave Creek/Carefree area and to Fountain Hills.
- The system includes approximately 25 park-and-ride lots at the end of service lines. These lots are located near freeways and generally do not have direct freeway access. Further analysis will identify specific sites for park-and-ride lots.
- Express bus service to the Central Business District on the Black Canyon (I-17) and Squaw Peak (SR-51) exit at Camelback Road to service activity areas along north Central Avenue, downtown Phoenix and the State Capitol.

Other opportunities for the express bus networks remain to be addressed. These opportunities include reverse commuting from Central areas to other high activity areas. Such routes might include downtown Phoenix to the Tempe/ASU area, and the potential for commuting between high activity secondary destinations, such as from downtown Tempe/ASU to the Scottsdale Airpark. Figure 10-2 shows the updated plan for express bus service

Bus Rapid Transit (BRT). The first BRT routes are programmed to be implemented in 2003. Where available, BRT service will utilize existing and planned HOV lanes and stop on a limited basis to provide rapid connections for commuters from north, east, west and south Phoenix to the Phoenix Central Business District. Off vehicle fare collection and ticketing is being considered to reduce boarding times. There will be an average of 40 trips per corridor with service provided during the morning and afternoon peak travel periods. BRT service is currently planned for the City of Phoenix only.

Shuttles/Circulators. Shuttles and neighborhood circulators provide local circulation needs in an integrated transit system. Frequencies by time of day and specific alignments will need to be adjusted to incorporate other planning efforts at the local and regional level. At this time, the plan includes service in the following central activity areas:

- 59th Avenue corridor between downtown Glendale and Glendale Community College.
- Camelback corridor from Central Avenue to 24th Street.
- Deck Park Station in downtown Phoenix to the State Capitol.

- Sky Harbor Airport.
- Downtown Tempe/ASU.
- Downtown Mesa.
- Scottsdale corridor from the Tempe light rail line to downtown Scottsdale.
- Metrocenter area.
- Ahwatukee/Foothills area.

Related Programs. The plan includes funding allocated to meet welfare-to-work transportation needs and travel demand management activities as identified in Sections 11 and 13 of this LRTP.

Light Rail. With the completion of the Central Phoenix/East Valley MIS, the Phoenix/Glendale MIS, and the Regional Fixed Guideway Study, a preferred fixed guideway technology of light rail has been identified. The light rail plan includes a 39 mile system, which incorporates the 22-mile option designated in the Central Phoenix/East Valley MIS, and the 12-mile option designated in the Phoenix/Glendale MIS. A 20.3-mile minimum operating segment (MOS) extending from Christown in Phoenix to Mesa will be the initial segment of the system.

Important elements of the light rail plan include provisions for park-and-ride lots at the end of rail lines and signal priority strategies to improve speed. Shuttle buses and an improved fixed route network also play an important role in the light rail system. Planned light rail service is shown in Figure10-3. Potential extensions of the planned light rail transit system shown in Figure 10-3 are largely beyond the 20 year horizon of this plan.

FUNDING PLAN

Previous updates of the transit element of the MAG LRTP have been based on approval of a county wide quarter-cent sales tax (or equivalent funding) starting in 2006. In the 1997 Update, the funding plan was based on local jurisdictions in Maricopa County pursuing dedicated sales tax measures for transit. This funding plan also assumed that federal funds would be forthcoming to pay 50 percent of the capital costs of the fixed guideway system component.

The existing funding situation for transit includes a half-cent sales tax to support transit improvements in Tempe and a 0.4 cent sales tax for transit in Phoenix. In 1998, the City of Mesa voted for a half-cent sales tax, a small portion of which is targeted for transit improvements. Several other cities within the region are considering presenting sales tax measures to voters for transit.

Funding strategies for the transit element of this FY 2001 Update could be developed from a variety of sources. Each strategy would involve some combination of funding from both existing and committed sources, with new sources deemed to be reasonably available. The

potential funding sources include:

- Federal formula and discretionary grant programs.
- State discretionary transportation funds.
- Regional dedicated revenue mechanism (sales tax or other).
- Local (city and county) dedicated revenue mechanisms (sales tax and/or other).
- Local (city and county) discretionary funds.
- Private sector contributions.

The funding strategy for this plan includes the equivalent of the following:

- A continuation of existing sources including city general funds, state contributions and federal sources.
- A 50 percent federal commitment to LRT capital costs.
- A quarter-cent sales tax regionally.
- A quarter-cent sales tax for cities with rail service.

While not all of the sales tax initiatives have succeeded, there is a clear and convincing pattern of official policy and voter support of the sales tax for transportation-related improvements. This past pattern, coupled with on-going transit funding efforts, meet the test for "reasonable availability" of new sources.

Specific funding measures that support the transit element of the MAG LRTP are listed in Figure 10-4 and include the following:

- FTA Section 5309, Discretionary Rail "New Start" and Bus Capital Funds. Based on previous commitments of 5309 funds, this source will cover half of the capital costs for light rail transit system and will double for the purchase of buses.
- FTA Section 5307 Formula Transit Capital Funds. Funding from this source will end for operations and capital funds for buses will be continud on a current dollar basis.
- MAG/Federal Congestion Mitigation and Air Quality (CMAQ) Formula Funds. CMAQ funding for bus acquisition is assumed to continue at current levels.
- Local Transportation Assistance Fund (LTAF) will be maintained at current dollar levels, but will not keep pace with inflation.
- Public transportation funds (currently $7 million per year) from the regional half-cent sales tax for transportation will end in 2005.

- City general funds will be maintained at current dollar levels but will not increase with inflation.
- Fares will cover approximately one fourth of overall operating costs for buses, 40 percent for light rail, and 9 percent for dial-a-ride services.
- Local sales tax equivalent to a quarter-cent for cities with rail.
- Regional sales tax equivalent to a quarter-cent.

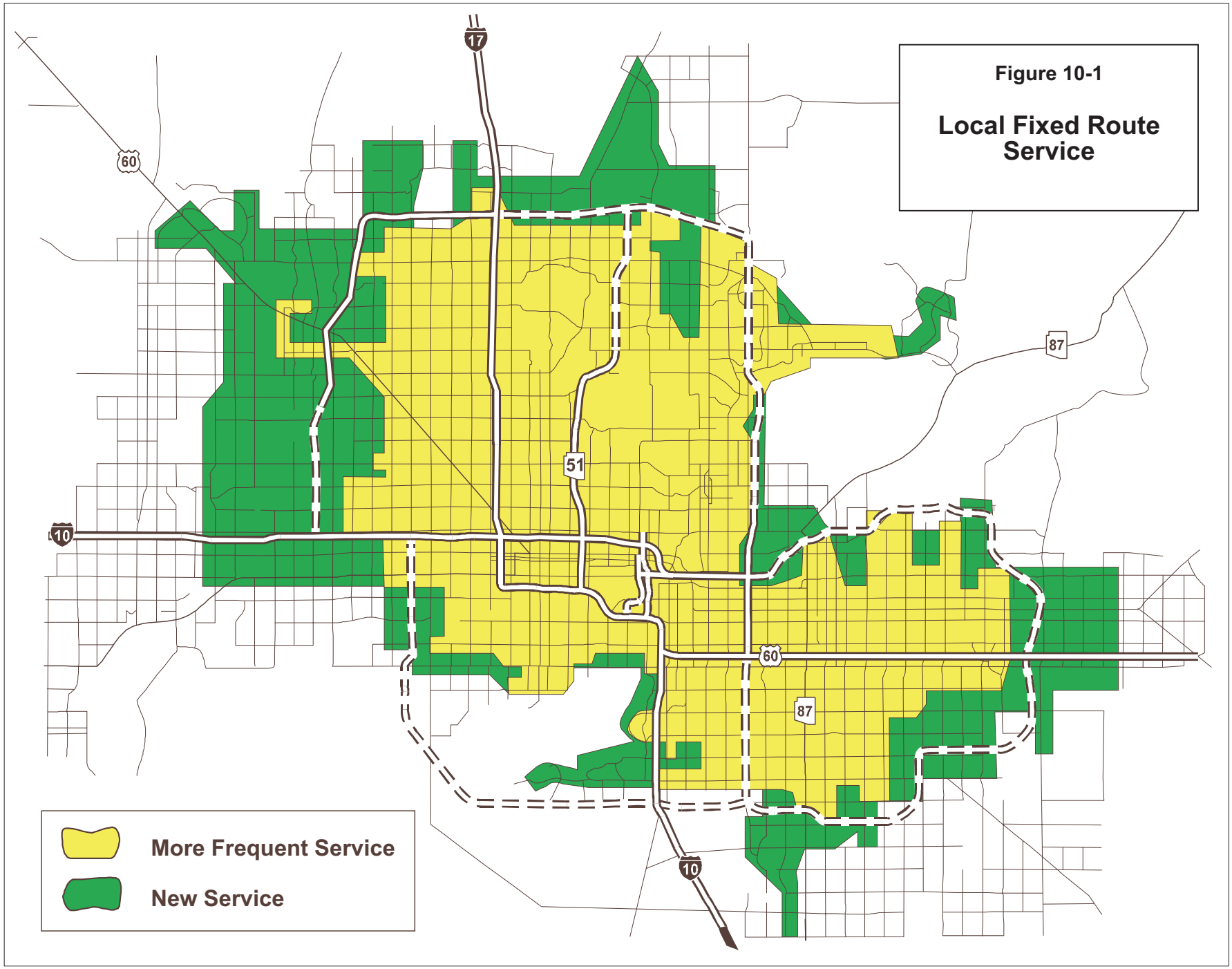
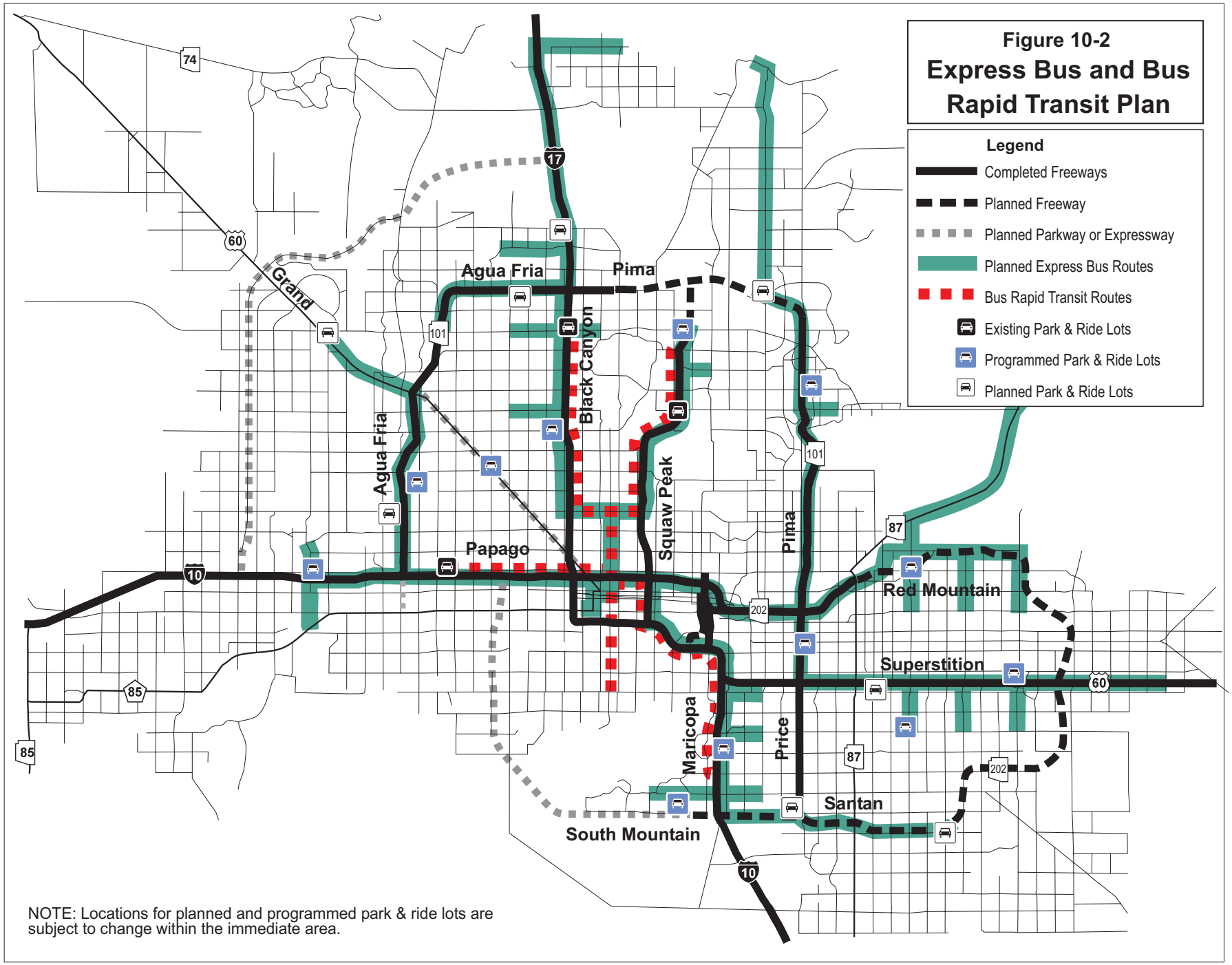


Figure 10-1: Fixed Route Service



NOTE: Locations for planned and programmed park & ride lots are subject to change within the immediate area.

Figure 10-2: Express Bus and Bus Rapid Transit Plan

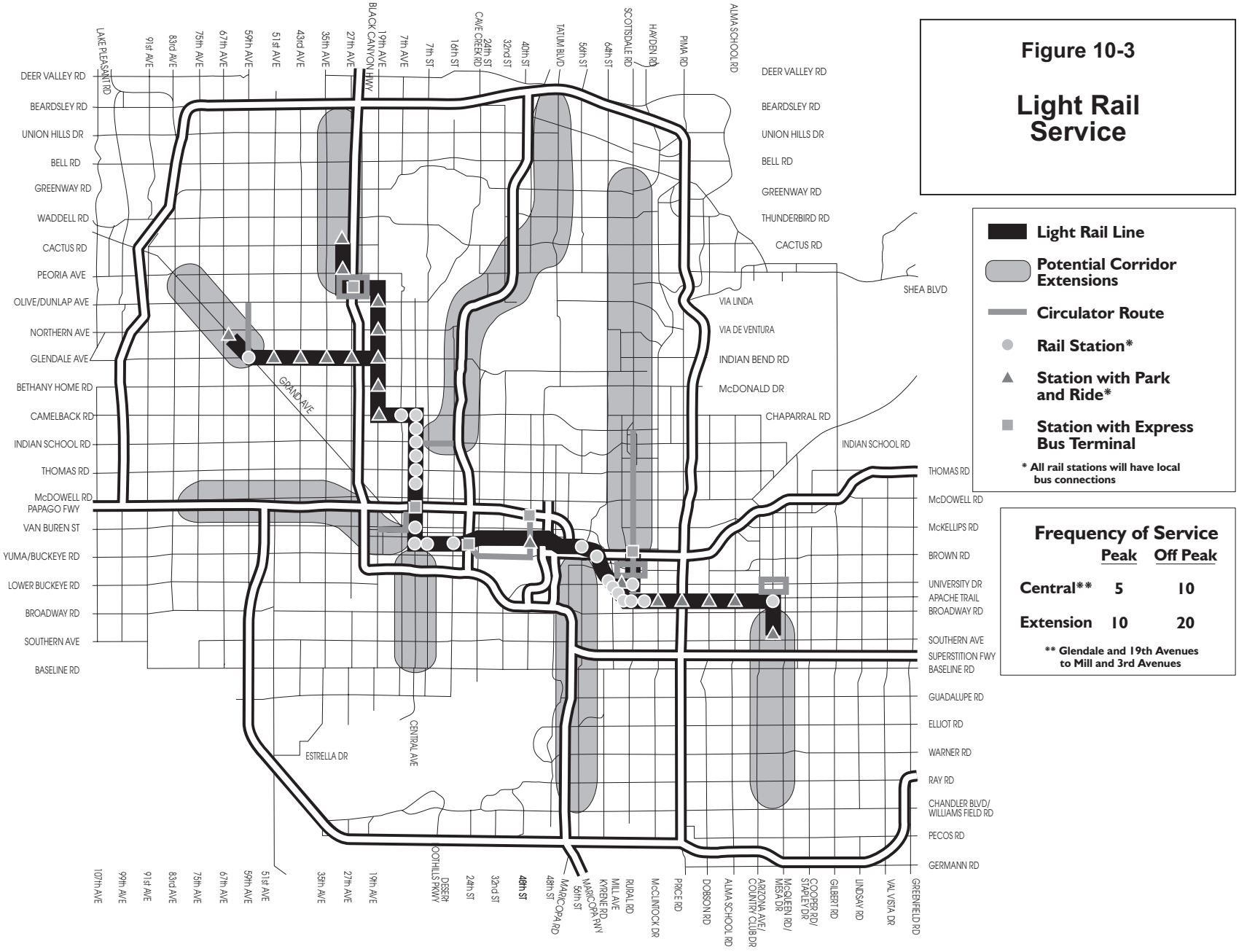


Figure 10-3: Light Rail Service

FIGURE 10-4 POTENTIAL LONG RANGE TRANSIT FUNDING PLAN (1)
(Constant Dollars in Millions)

ANNUAL REVENUE MILES OF SERVICE (Millions)	FY 2001	FY 2021	TOTAL 2001-2021
Local	19.5	23.8	454.3
Express and BRT	.8	1.1	23.5
Dial-a-Ride	7.6	19.2	298.2
Light Rail	0.0	1.4	16.7
Total	28.0	45.5	792.8
OPERATING COSTS			
Local	$83.2	$269.4	$3,347.4
Express and BRT	$4.0	$13.2	$171.0
Dial-a-Ride	$20.5	$136.5	$1,464.2
Light Rail	$0.0	$35.9	$424.0
Planning	$0.5	$0.8	$13.6
Travel Demand Management & Vanpool Program	$3.2	$67.6	$460.5
Total	$107.7	$455.2	$5,880.9
CAPITAL COSTS			
Local Buses	$29.4	$78.9	$1,089.6
Express Buses	$6.5	$0.2	$74.2
Dial-a-Ride Vehicles	$3.2	$6.2	$97.7
Light Rail (2)	$16.5	$0.0	$1,944.5
Operations Support (3)	$8.2	$14.8	$234.5
Vanpool Program	$2.7	$10.2	$127.0
Park-and-Ride Lots and Bus Pullouts (4)	$8.6	$20.0	$220.6
Transit Stations, Centers and Stops	$6.2	$2.0	$43.7
Maintenance Facilities (5)	$11.7	$2.7	$203.1
Other Capital Support (6)	$6.0	$1.2	$42.7
Total	$99.0	$136.2	$4,077.6
FUNDING (5)			
Local Bus Fares (7)	$25.0	$80.8	$1,004.2
Express Bus and BRT Fares (8)	$1.0	$3.3	$42.7
Light Rail Transit Fares (9)	$0.0	$11.0	$127.4
Dial-a-Ride Vehicle Fares (10)	$1.8	$12.1	$130.3
Local General Funds	$32.4	$65.0	$1,027.4
Local Sales Tax (11)	$109.6	$197.9	$3,141.9
Local Funds provided for Rail Capital	$1.3	$2.3	$36.2
Regional Sales Tax (12)	$7.2	$136.1	$1,715.3
LTAFII	$9.0	$8.5	$183.4
Federal Light Rail Transit (Section 5309)(13)	$9.9	$48.0	$1,172.8
Federal Bus (Section 5307)	$23.5	$48.6	$761.2
Federal Bus (Section 5309)	$9.8	$31.7	$493.6
MAG CMAQ	$13.6	$13.9	$209.2
STP	$3.0	$3.3	68.3
Total Funds	$247.0	$662.7	$10,114.2

ENDNOTES

1 Includes local and regional expenditures for public transportation.
2. Assumes that LRT will expand beyond the initial 20.3 mile segment in FY 2007.
3. Includes computer and communications equipment, support vehicle purchases and other equipment to support various programs.
4. Includes the twenty Park & Ride Sites identified in MAG's Park-n-Ride Study and Park-n-Ride improvements identified by the City of Phoenix.
5. Includes new construction identified in the RPTA's Transit Operating Facility Master Plan and assumes maintenance costs after FY 2010.
6. Includes Intelligent Transportation System Costs.
7. Assumes fare revenue will be 30 percent of local bus operating costs.
8. Assumes that fare revenue will be 25 percent of express bus/BRT operating costs.
9. LRT Fare revenue from "Central Pheonix/East Valley LRT Project: Section 5309 Supplemental Report on New Start, Table 9, September 2000.
10. Assumes fare revenue will be 8.9 percent of Dial-a-Ride operating costs.
11. Includes sales tax in the Cities of Phoenix, Mesa, and Tempe.
12. Assumes reauthorization of the regional sales tax in FY 2006.
13. Assumes federal funds are available for high capacity transit after the intial segment in FY 2007. FY 2001-2007 figures from "Central Phoenix/East Valley LRT Project: Section 5309 Supplemental Report on New Start, Table 8, September 2000. For FY 2008-2020, federal funds assumed to be approximately 50 percent of capital costs.

SECTION 11

DEMAND MANAGEMENT

Transportation Demand Management (TDM) programs encourage reductions in travel demand within the transportation system. These programs promote alternative modes of travel including carpooling, vanpooling, walking, bicycling, as well as alternative work schedules that reduce trips including telecommuting and compressed work schedules. Based on a recent survey, 40 percent of people use alternative modes or work schedules to work one or more days a week (2000 *TDM Annual Survey*, WestGroup Research, 2000). The following sections describe a number of TDM activities which are part of the MAG Long Range Transportation Plan (LRTP).

RIDESHARE PROGRAMS

Federal transportation funds distributed by MAG support the Regional Rideshare Program and provide partial support to the Maricopa County Trip Reduction Program and Capitol Rideshare Program. The Regional Rideshare Program supports efforts to share an automobile ride and to use alternative modes of transportation and work schedules throughout the MAG area. This program is administered by the Regional Public Transportation Authority (RPTA), or Valley Metro.

One of the services provided by the Regional Rideshare Program is a computerized ridematching program that offers commuters interested in carpooling or vanpooling a list of potential partners who live and work in the same areas. Transit information is provided to those interested in receiving bus schedule information as well. At present, carpooling to work as a percent of total trips increased from 14 percent to 17 percent.

For many years before the enactment of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), several demand management programs were operational in the MAG region. The regional carpool/vanpool matching program, sponsored by MAG, was initiated in 1973 for the purpose of reducing energy consumption during the “energy crisis.” The Regional Rideshare Program has been expanded significantly since 1987 as an adopted air pollution control strategy for carbon monoxide, ozone and particulate matter in the State Implementation Plan. Since 1986, the Regional Rideshare Program has been administered by the RPTA. The state rideshare program (Capitol Rideshare) offers carpool matching and other rideshare services to all state employees located in Maricopa County.

CLEAN AIR CAMPAIGN

The Clean Air Campaign, an area-wide public awareness program, is designed to reduce unnecessary vehicle use and has been ongoing since 1987 when it was initiated by the Greater Phoenix Chamber of Commerce. The Clean Air Campaign is a public/private

partnership with sponsors that include the Greater Phoenix Chamber of Commerce, the Arizona Departments of Environmental Quality and Transportation, Maricopa County, MAG, and the RPTA. A working group of sponsors provides direction to the campaign and was expanded in 1996 to include additional community organizations like the Arizona Lung Association and Valley businesses. The sponsors provide the necessary leadership to encourage business participation and initiatives.

The Campaign has urged residents to reduce vehicle miles traveled during peak hours by using alternate modes or alternative work schedules at least one day a week. In the past, the campaign has concentrated its media campaign during the critical six to eight week carbon monoxide pollution season from mid-November to mid-January due to a restricted budget. During the summer of 1996, a summer ozone media campaign was launched to address the critical need to avoid a reclassification related to meeting ozone standards with emergency funds provided by the Arizona Department of Environmental Quality. This was followed in 1999 and 2000 by the Governor's Ozone Alert Program. Redesignation of our area's ozone attainment status could not be done until the third consecutive summer without a violation, which was achieved in 1999. No violations of ozone have occurred for four years and redesignation to attainment is pending.

TRIP REDUCTION PROGRAM

The need to improve air quality was the primary factor leading to the establishment of the Maricopa County Trip Reduction Program (TRP). Mandated by Arizona legislation in 1988, employers with 100 or more workers at a site began participating in this program in 1989. At that time, approximately 500 employers and schools participated in this program representing over 350,000 employees and students. Participating employers are required to conduct an annual survey of the commuting modes of their employees, and prepare and implement a travel reduction plan to reduce the rates of single-occupancy vehicle (SOV) trips or the single occupancy vehicle miles traveled. Another key role of the Trip Reduction Program is to assist employers and schools of 50 or more employees or students through the provision of support services and programs.

Originally, the State law established trip reduction goals of five percent for the first and second year of participation by an employer. After implementing the program, it was determined that approximately 30 percent of the workforce in the region was covered by these requirements. It was anticipated that full implementation of the requirements would reduce regional VMT by 0.8 percent from projected levels for 1995.

The 1988 Arizona air quality legislation also required Maricopa County to enact an ordinance in 1992 to prescribe reduction goals and employer participation for subsequent years. On October 5, 1992, Maricopa County enacted an ordinance that strengthened the TRP by providing third, fourth, and fifth year travel reduction goals of five percent annually, and by expanding the ordinance to apply to employers with 75 or more employees at a work site. Since the program was expanded, over 800 employers became involved. It is estimated that

the strengthened TRP would reduce regional VMT by 1.8 percent from projected levels for December 1995, as needed to meet carbon monoxide emission reduction goals.

In November 1993, a special session of the state legislature passed an air quality bill that further expanded the TRP to include employers of 50 or more employees and increased the goals to ten percent per year reduction in SOV trips or miles traveled. Currently, over 1,200 employers are participating in the program representing over 614,000 students and employees.

In the summer of 1996, another special session of the legislature passed an innovative enhancement to the TRP whereby employers will be allowed to implement several new "flexibility" strategies to meet TRP goals. The majority of employers have not met the annual goals of ten percent reduction in SOV trips or miles. Now, under these flexibility provisions, employers will have an expanded menu of measures for implementation including reduction of business-related vehicle trips, off-peak hour commuting, reduced use of other gasoline powered equipment and stationary source emission reductions.

VANPOOL PROGRAM

The RPTA has provided a third-party vanpool service to interested commuters since 1987. As of January 2001, more than 175 vanpools are in operation. The number of new vanpools increased by 41 in this fiscal year. Over 775,000 passenger trips per year are made by vanpool. RPTA has been contracting with a third-party private vanpool firm to provide vehicles, insurance, fleet services and billing. Valley Metro has has initiated an aggressive van purchasing program using Congestion Mitigation and Air Quality (CMAQ) funds from the Federal Highway Administration, to replace vendor owned vans in the vanpool fleet. This process will continue as funding is available until the entire vanpool fleet is owned by Valley Metro. This approach will be more cost effective than the vendor owned approach.

The monthly vanpool passenger fares cover nearly 100 percent of the operation costs. In fiscal year 2000, the vanpool program budget was nearly $1,000,000. Along with passenger fares, Federal Transit Administration (FTA), Federal Highway Administration, and some RPTA revenues generated from the regional one-half cent sales tax fund the program. Many employers, especially those with insufficient or no bus service, help promote vanpooling as part of their TRP plans by providing a vanpool subsidy, therefore keeping fares lower to employees. As part of the RPTA vanpool program, a Guaranteed Ride Home Program is provided that offers up to two free (taxi) rides home per year.

TRANSPORTATION MANAGEMENT ASSOCIATIONS

Another approach to travel demand management is the formation of Transportation Management Associations (TMAs) and employer transportation networking groups. Through these formal and informal associations, employers share resources to promote alternative mode use, improve mobility, or implement trip reduction programs in their local areas. As of January, 2001, there were twelve TMAs in the MAG region. One new TMA formed this past

year in the Papago Park area, a new employment area near Priest Drive and Washington Avenue. Two TMAs are formally organized and incorporated with elected officers, bylaws and dues-paying members. The other ten TMAs are informal networking groups and are less formal in their organization and are not incorporated.

Together, these TMAs involve about 250 employers. RPTA provides staff support to the ten informal network groups in the Valley and provides financial support to the two formal TMAs.

TELECOMMUTING

With the advent of new technology and the change to a knowledge-based economy, a growing number of employers are allowing their employees to work in a location other than the central office. With telecommuting, employees can be linked to an office by a personal computer. A random survey of Valley residents in 2000 indicates that over 64 percent of households in the Phoenix area have a personal computer (2000 *TDM Annual Survey*, WestGroup Research, 2000). Approximately 66 percent of households now have internet access, and of those employed 80 percent have internet access. Twenty percent of employed residents with internet access also have "connectivity" from home to work. And, one third of residents with internet access already have a "high speed line." This high level of PC ownership, internet access, connectivity from home to work, and high speed lines will continue to make it easier for more Valley employed persons to telework.

Employees may telecommute either on a full-time or on a part-time basis, with most telecommuters working at or near home one or two days per week. By working at home, or at a satellite work center, the commute trip is eliminated or shortened. About five percent or approximately 67,000 residents work from home at least once a week. If you include those who are regular and occasional telecommuters, it is estimated that twelve percent of employees telecommute.

Arizona has become a leader in the promotion of telecommuting. The State of Arizona and AT&T started some of the first formal telecommuting programs in the state with a joint pilot program in 1990. MAG and RPTA started promoting telecommuting in 1992. RPTA provides support and technical assistance to employers to help them start telecommuting programs including training workshops and sample policies and agreements, management briefings and one-on-one assistance.

Opportunities to reduce trip making in this category would appear to be substantial. The random survey of Valley residents in 2000, mentioned above, also indicates that one-third of all workers (and 40 percent of workers at large firms) indicate that their jobs would allow them to telecommute at least one day per week. There are almost 400 Valley employers of over 50 employees indicating they allow some form of telecommuting. A business survey of employers of over five employees indicates that up to 16 percent of all Valley businesses allow some form of telecommuting.

TELECONFERENCING/VIDEOCONFERENCING PROJECT

MAG has established a Teleconferencing Program to link MAG and its member agencies via teleconferencing. The first phase of this program, the MAG Regional Videoconferencing System Project, is designed to facilitate communication between agencies while reducing the need to travel to meetings. The MAG Regional Videoconferencing System has a central videoconferencing location at the MAG offices and satellite locations housed at each member agency. This system allows for communication between MAG and its member agencies as well as among member agencies without direct participation by MAG.

The benefits of the MAG Regional System Videoconferencing Project include:

? Reducing vehicle miles traveled by making it unnecessary to travel to as many meetings; and in turn relieve traffic congestion and reduce air pollution.
? Increasing public input in the regional decision-making process by affording the public an opportunity to participate in meetings at various videoconferencing sites.
? Facilitating audio and visual electronic meetings for community groups and under-served populations.
? Widening communication possibilities outside the region.

The MAG Regional Videoconferencing System Project is a demonstration project which will provide a blueprint for setting up similar videoconferencing systems in other Councils of Governments and Metropolitan Planning Organizations.

FUNDING

TDM programs are projected to continue at current funding levels over the life span of the LRTP. Based on current funding commitments, it is anticipated that approximately $37 million over the 2001-2010 period and $60 million over the 2011-2021 period will be available for TDM programs. These projections are in 1999 constant dollars and assume that committed funding sources will increase due to population, but decline overall due to inflation.

SECTION 12

SYSTEM MANAGEMENT

Transportation System Management (TSM) programs help to improve traffic flows within the transportation system. Transportation technological developments known as Intelligent Transportation Systems are significant parts of this program. The following section describes a number of TSM programs which are part of the MAG Long Range Transportation Plan (LRTP).

INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems, or ITS, involve the application of advanced sensors, computers, electronics and communication technologies in an integrated manner, along with management strategies, to increase the safety and efficiency of the surface transportation system. The products and services resulting from ITS help improve safety and efficiency by:

- Collecting and transmitting information on traffic conditions and transit schedules to aid travelers before and during their trips.
- Relieving congestion by reducing the number of traffic incidents through better traffic flow coordination, detecting and clearing incidents quickly when they occur, and rerouting traffic flow.
- Helping drivers reach desired destinations with navigational aid systems.
- Raising the productivity of vehicle fleets through automated tracking, dispatch and weigh-in-motion systems.
- Benefitting public and governmental agencies through lower costs, enhanced services and a healthier environment for all.
- Helping people and goods move more safely and efficiently by providing information links between travelers, vehicles and infrastructure.

ITS Planning. Over the last few years MAG has taken progressive steps toward mainstreaming ITS in the transportation planning process. Regional ITS planning efforts are currently led by MAG. In 1996, the first ITS Strategic Plan adopted by the region identified priorities for implementing ITS solutions in the region. A range of alternatives for developing and maintaining ITS were evaluated and recommended in the plan, and included:

- Upgrading field equipment to enhance existing traffic monitoring capabilities
.

- Upgrading data processing systems at local traffic management centers (TMCs) to improve central monitoring and control capabilities.

- Implementing communications infrastructure to provide the communications between field elements.

- Improving the coordination between the TMCs and transit management centers.

In September 1999 a project to update the strategic plan was initiated by MAG. This project was necessitated by significant ITS developments at the local and national levels. Oversight for this project was provided by a Regional ITS Stakeholder Group consisting of the MAG ITS Committee and other regional ITS stakeholders. The Plan update was adopted in February 2001 and will serve as the road map for future ITS deployment in the region.

Some of the highlights of the updated plan are:

- Mainstreaming ITS in the Planning Process – Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP) process.

- Operation and Management Plan – O & M responsibilities, resources.

- Development of a Regional ITS Architecture – consistency requirements.

- ITS Implementation Plan – short-, medium- and long-term.

- Evaluation Plan – agency responsibilities, data needs.

- ITS Training and Capacity Building – training needed by agency staff.

Freeway Management System. The regional freeway system is a primary component of the regional transportation system. Mobility in the region largely depends on the ability of this system to address travel demand. For efficient operation and management of this system, ADOT is utilizing an integrated suite of ITS strategies commonly known as a Freeway Management System (FMS). The regional FMS first became operational in 1996 and provides surveillance, incident management and traveler advisory functions.

The physical system consists of electronic message signs, traffic signals for metering traffic flow at ramps, closed circuit television cameras, vehicle detectors and a telecommunication network that links all these devices to a Traffic Operations Center (TOC). Traffic management strategies are directed from the control center in response to varying traffic conditions. The TOC is staffed 24 hours per day, seven days a week and also serves as a statewide highway emergency management center.

National experience shows that similar systems could yield benefits that far exceed the costs. The implementation and effective operation of the FMS as a congestion mitigation strategy

has been recognized by MAG as a high priority for the region. To facilitate rapid FMS implementation, MAG has approved the installation of communication conduits and other basic infrastructure whenever new freeway segments are constructed.

The region is currently served by nearly 175 miles of freeway and has plans for completion of a 225 mile system by the year 2007. Figures 12-1 and 12-2 describe the existing and projected expansion of the regional FMS.

Figure 12-1: Expansion of the Regional Freeway System and the Freeway Management System

	1998	**2001**	**2021**
Urban Freeway System	130 miles	175 miles	225 miles
Freeway Management System	42 miles 32%	84 miles 48%	225 miles 100%

Arterial Traffic Management. In 1996, based on a proposal to the U.S. Department of Transportation (USDOT) from a local public-private partnership, Phoenix was selected as one of four national ITS Metropolitan Model Deployment Initiative sites to serve as models for integrated urban ITS deployment. MAG was an active member of this coalition. The project, named AZTech, was primarily funded by a grant of $7.5 million from the USDOT. The total investment in regional ITS applications, including matching contributions from coalition partners, is estimated to exceed $15 million.

The goal of the AZTech project was to improve regional mobility and safety. Eight high-priority Smart Corridors were instrumented with additional vehicle detection, surveillance cameras and electronic message signs at strategic locations. These corridors cover approximately 160 miles of arterial streets. Additionally, the project has established and linked twelve regional traffic management centers. Improved communications that resulted from implementing the system has led to significant improvements to traffic signal coordination across jurisdictions. Frequent traffic information updates, gathered using AZTech infrastructure, are currently available to local radio, television and cable TV media. In the near future motorists will be provided with current information on traffic and road conditions via electronic signs on Smart Arterials.

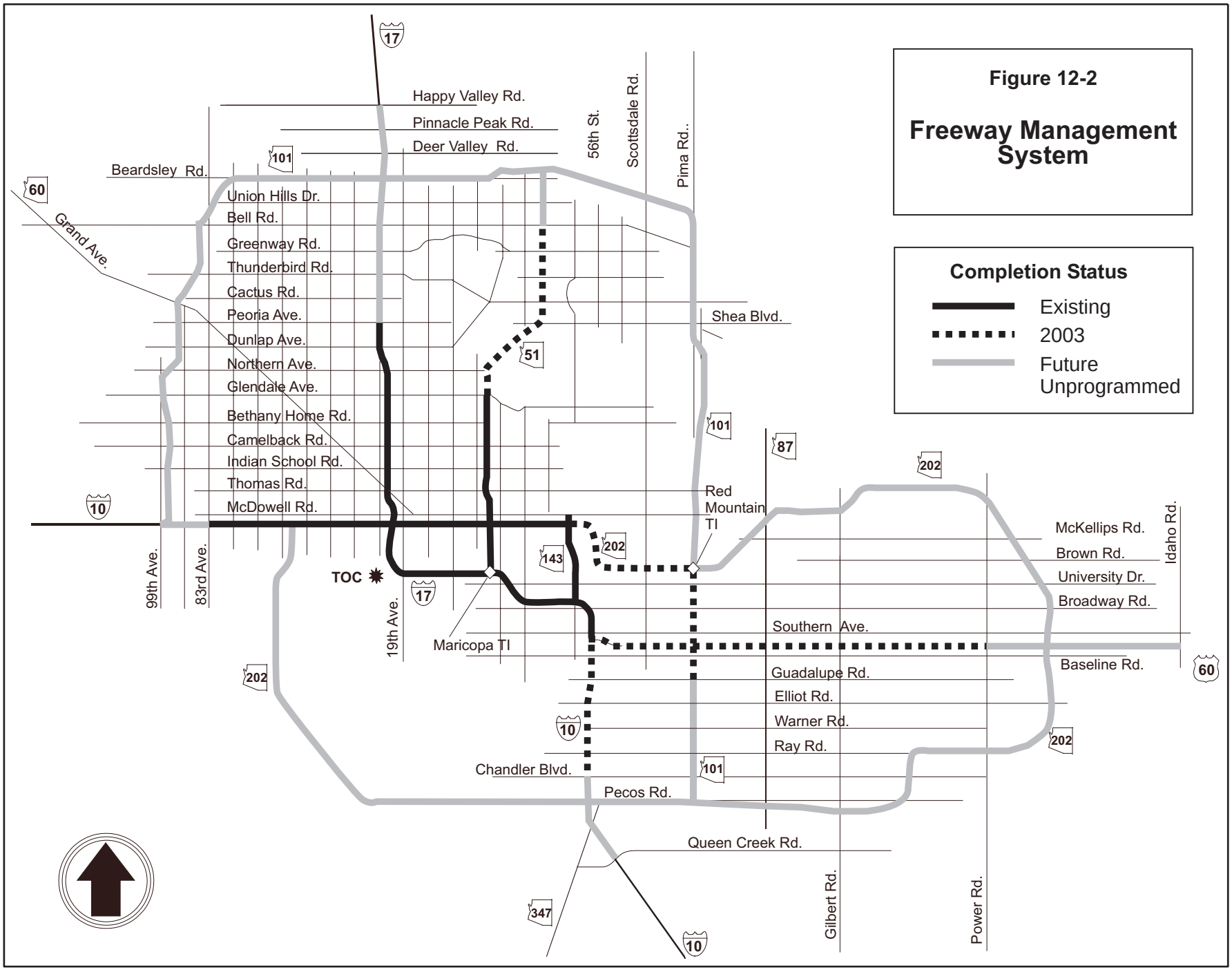


Figure 12-2: Freeway Management System

One of the key goals of the project was the integration and linkage of the traffic management function between freeways, arterials, public transit and emergency management systems. This integration is expected to provide long-term benefits by enabling free exchange of traffic data and video information among nine of the traffic management centers. The planned AZTech Smart Corridors are illustrated in Figure 12-3.

Traveler Information Services. AZTech launched some of the first privatized traveler information systems in the country. A few products and services providing motorists accurate and timely information on road conditions are currently available. These include personalized traffic messages via pager, telephone or e-mail. These messages warn travelers of any major delays or slowdowns on the traveler's preferred route to work or home. Due to the pioneering nature of these systems and services they are prone to problems common with first generation technology. Due to this reason these products and services are not being emphasized through marketing by the private sector providers. However, the advent of wireless internet access and voice recognition software in automobiles is expected to lead to a surge in these services over the next five years.

Electronic Communications. Traffic broadcasts provide feeds for cable and broadcast television based on traffic conditions monitored by the system. The initial service started in the City of Tempe in June, 1998 and is expected to expand to other local cities. A private sector partner is adding information gathered via AZTech infrastructure to traffic condition radio reports. Additionally, a commercial internet website provides information on freeway and arterial traffic conditions, road closures and restrictions, incidents and transit schedules.

Kiosks. Approximately 50 interactive information kiosks are planned for development in shopping malls, public buildings and a variety of other locations. All traveler information will be combined with other commercial information, such as Yellow Pages, and will be provided at no cost to users.

Advanced Public Transportation Systems. Advanced Public Transportation Systems (APTS) are defined as advanced technology based ITS applications in public transportation. These applications are relevant to fixed route bus, paratransit, vanpool, and rail. These technologies can be used to improve passenger convenience, vehicle operations, and mechanical systems.

Passenger convenience technologies directly benefit passengers through advanced traveler information, real-time schedule updates, and fare payment. Vehicle operations technologies are associated with dispatching vehicles and in-vehicle systems. Mechanical systems technologies are designed to remotely monitor the electrical and mechanical infrastructure of transit vehicles.

The Valley Metro Vehicle Management System Master Plan (VMS) serves as the regional guide for implementing ITS transit infrastructure. As recommended by the VMS, transit radio and communications systems need to be upgraded prior to expanding the transit ITS.

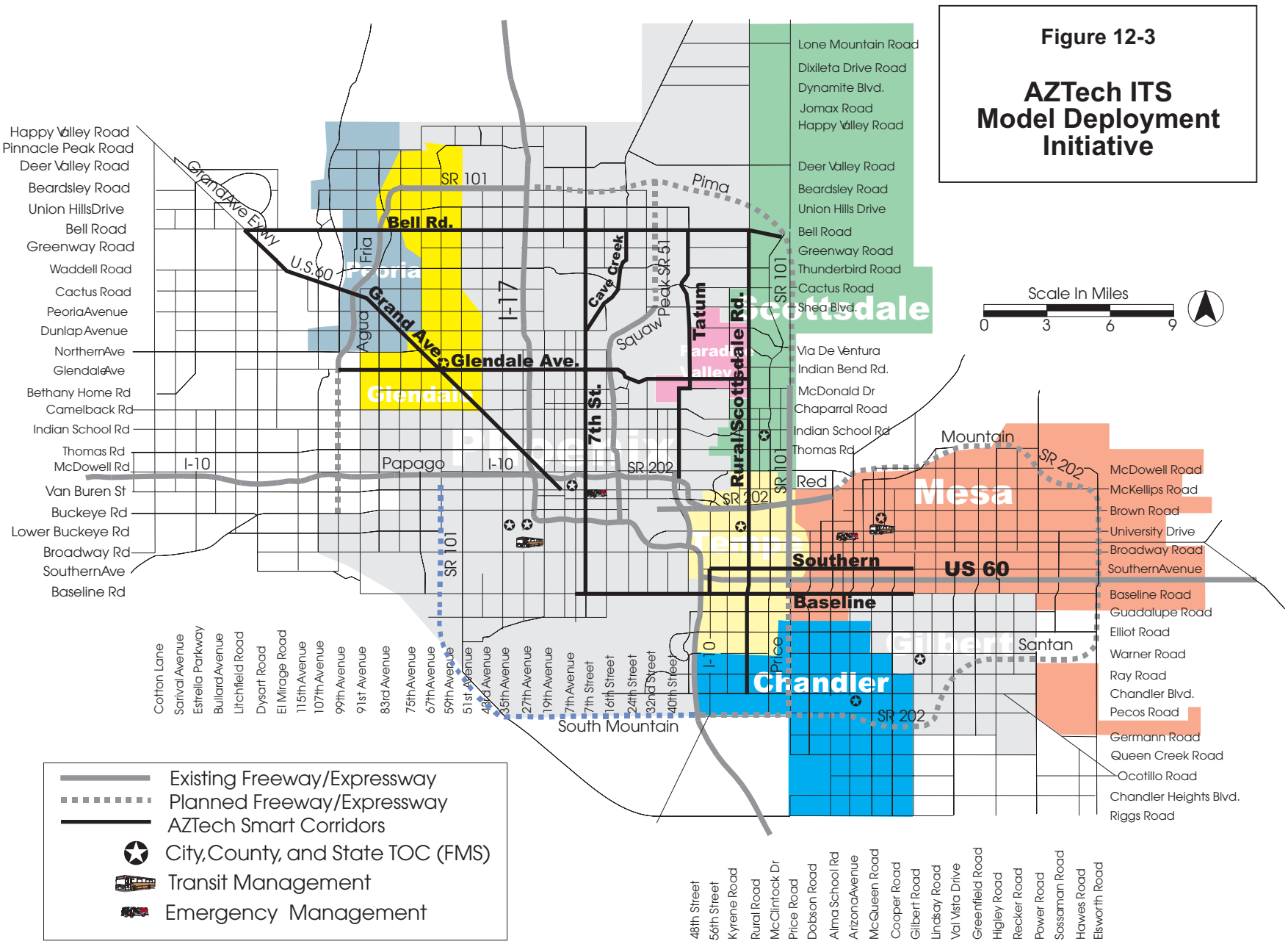


Figure 12-3: AZTech ITS Model Deployment Initiative

A portion of the AZTech grant was used to fund the implementation of new technology on eleven bus routes and more than 100 city buses. Vehicles that operate on these routes are equipped with Automatic Vehicle Location (AVL) devices which use Global Positioning Satellite (GPS) receivers to electronically track vehicle location. The deployment of this technology, combined with other technologies, has given transit passengers the ability to obtain real-time information on specific bus routes at the following internet site: http://www.etaktraffic.com/Phoenix/Script/Schedule/Phoenix.htm

Real-time information such as time to next bus, delays, and next stop information is available on four bus routes in Phoenix and seven bus routes in Mesa.

Additional benefits of implementing AVL include new operations data, which can result in better allocation of capital resources, improved road supervision and emergency response times, and lower operating costs. Planned systems are listed below.

Passenger Convenience

- Automatic vehicle locator/geographical positioning system (AVL/GPS).
- In-vehicle automatic next-stop annunciators.
- Changeable message signs and/or audio annunciators (at transit centers and other remote locations).
- Smart-card fareboxes and complementary infrastructure.
- Centralized dial-a-ride call-taking and scheduling.
- Centralized trip planning facilities.
- Electronic messages at transit centers and bus stops used to inform passengers of current bus location.
- Interactive information kiosks at transit centers that provide bus route, schedule and traffic condition information.

Vehicle Operations

- Intelligent Vehicle Control Units (IVCUs) to control on-board mobile data terminals (MDT), radios, GPS receivers, emergency alarm, covert audio and video monitoring, public address systems, destination signs, engine monitoring, fareboxes, automatic passenger counters, and traffic signals.
- Computer aided dispatch (CAD) systems.
- In-vehicle mobile data terminals (MDT).
- In-vehicle emergency alarm activation and covert audio\video monitoring devices.
- In-vehicle automatic passenger counters.

- Systems that provide dispatchers real-time updates on traffic conditions and route status to determine if buses are on schedule.
- Dial-a-ride scheduling system.

Mechanical Systems

- In-vehicle sensors to monitor vehicle electrical and mechanical systems.

INTERSECTION AND INTERCHANGE IMPROVEMENTS

Several efforts are underway throughout the region to improve existing intersections and interchanges. These efforts are incorporated into the Plan to improve the performance of the existing system performance.

Intersection Improvements. Two types of improvements to intersections are incorporated into the Plan. The first type of project is one which affects physical improvements such as additional turning lanes and widenings. The second type affects operational improvements such as upgrading of traffic signals, signal coordination and closed-circuit television cameras for traffic surveillance. Both types of projects are identified and programmed for improving safety and reducing congestion.

Interchange Improvements. In February 1996, ADOT completed a study of all traffic interchanges on the statewide highway system. The study identified roadway geometric conditions, capacity deficiencies, safety and multimodal factors. All of the interchanges were evaluated using these criteria and ranked using a benefit/cost process. MAG has considered these results and other regional needs to develop a comprehensive list of interchange improvement needs. A total of sixteen interchanges in the metropolitan area have been identified as requiring improvements. Fifteen of these interchange improvements are planned for completion by 2007.

High Occupancy Vehicle (HOV) Interchange Improvements. Two HOV-related interchange improvements are planned for completion by 2007. Direct freeway-to-freeway HOV ramps are planned for interchanges at Squaw Peak/I-10 and Superstition/I-10. These projects are being built in conjunction with new HOV lanes on the Superstition and Squaw Peak.

FUNDING

TSM efforts will also continue into the future. In 1999, there has been an increased emphasis in funding TSM projects from a variety of sources. In addition to the $7.5 million model deployment grant from the federal government for ITS, MAG Congestion Management and Air Quality (CMAQ) funds are consistently committed to system management projects in the five year program. Cities continue commitments to improve signal coordination while the Arizona Department of Transportation (ADOT) has programmed additional funding for the FMS. ADOT has completed a study of grade separated traffic interchanges throughout the state and

has made a financial commitment to include identified minor and intermediate cost projects in the five year program. A separate funding plan has not been developed for system management project as they are an integral part of plans and projects for each mode of transportation.

SECTION 13

SPECIAL TRANSPORTATION NEEDS

The transportation needs of special populations are a regional concern. Limitations caused by age or disability complicate securing transportation for a portion of the population. In addition, those who are seeking employment or training and those who have few financial resources find limited transportation options available to reach second shift and weekend employment.

CHANGES IN WELFARE

Changes in federal welfare laws now limit cash assistance to a five-year lifetime limit, and require recipients to enroll in education and training and seek employment within a two-year time frame. There are thousands of people receiving this assistance in the region, and they must transport their children to child care in addition to meeting employment and training requirements. Failure to meet these requirements results in the loss of cash assistance, giving a new urgency to clearly define the transportation needs of this population.

To better understand the transportation barriers faced by these populations, and to identify potential transportation options, a special study was conducted. Data in the study was secured from the Arizona Department of Economic Security (DES) to spatially locate cash assistance recipients. New employment opportunities were matched with these individuals, along with locations of employment and training facilities and child care centers. MAG sponsored several regional and statewide meetings to identify barriers and secure input on possible options.

ELDERLY MOBILITY CONCERNS

In the coming decades, Maricopa County, along with almost all other areas in the nation, will experience a tremendous rise in the number of older people and in their percentage of the population. By the year 2021, approximately 22% of the residents of Maricopa County will be age 60 and older. Of these approximately one third will be 75 or older. Although the seniors of the future will be healthier, better educated, and more financially secure than comparable elders of a few years ago, many will experience physical, financial, emotional and mental barriers in using various transport modes. Elders who live alone, have no close family, and/or have limited financial means will face even more difficult and life-threatening transportation challenges.

Research indicates seniors preferred method of travel is driving - over 80 percent of trips made by those 65 and older are made in cars.[1] Even among those who are 85, almost 40% of those traveling in a private vehicle are the driver. Conversely, no cohort of the elderly takes more than 2.3% of their trips by transit. Walking is a more frequent mode choice for older people than public transit by a factor of at least two.[2] While elder drivers are involved in fewer total crashes than other age-groups, there are more crashes compared to the number of miles driven. Persons above 80 years of age who are involved in crashes are *four times* as likely to die in the crash as are younger persons.[3]

One of the focus areas of the 1998 MAG Special Needs Transportation Study was the "frail elderly." This focus provided the basis for more in-depth analysis of the transportation needs of the elderly in Maricopa County by human services and transportation planners and providers. *Elderly Mobility Solutions*, a program focused on the specific transportation needs of the elderly in Maricopa County, is currently under development by the MAG Human Services and Transportation Committees.

TRANSPORTATION PROGRAMS AND FUNDING

A variety of funding sources can be applied to meet special transportation including funding from medical assistance and social service programs. The focus here is on transportation programs and funding committed to meet human service needs. Figure identifies funding sources and needs.

Federal and State. On a regional scale, three major transportation programs target special populations: Work Links, Wheels-to-Work, and the Elderly and Persons with Disabilities Transportation Program. These programs differ in type, target population, geographic area, and fund sources.

- Work Links. Work Links is a 24-hour, 7-day-a-week transportation brokerage service for low-income persons and cash assistance clients. Mobility managers work with participants to assess transportation needs and match them with existing resources. The program also includes efforts to expand the use of vans and paid drivers to link people to the bus system. Maricopa County operates this program county-wide, in partnership with a number of

[1] Dr. Sandi Rosenbloom, *The Mobility of the Elderly: There's Good News and Bad News*, November 1999. Prepared for the Transportation Review Board Conference, Transportation in An Aging Society; A Decade of Experience.

[2] Rosenbloom.

[3] *Addressing the Safety Issues Related to Younger and Older Drivers*, A Report to Congress, NHTSA, 1993.

transportation and human services providers. The primary fund sources for this program are FTA Job Access and MAG federal transportation funds directly available to MAG. Federal transit funds that support paratransit programs for those who can not access fixed route buses are addressed under the transit section.

- Southwest Inter-City Transit System. The FTA Job Access grant received this past year to fund Work Links also provided funding to support the Southwest Inter-City Transit System, a neighborhood bus service available to residents in the West Valley cities of Avondale, Goodyear, Litchfield Park and Tolleson.

- Wheels-To-Work. A program created in 1998, Wheels-To-Work, promotes a tax credit for donation of cars to be used by cash assistance recipients who have no alternative transportation means. The program is operated by *Goodwill Arizona* on a state-wide basis and funded by the Federal Temporary Assistance for Needy Families Block Grant.

- Elderly and Persons with Disabilities Transportation Program. Section 5310 of the Federal Transit Act authorizes capital assistance to states for transportation programs that serve the elderly and people with disabilities. The program is administered by the Arizona Department of Transportation. Funds are distributed according to MPO planning regions and allocated through a regional review process administered by local Council of Governments. Eligible recipients for these funds are non-profit organizations and local jurisdictions which can demonstrate that the proposed transportation service cannot be provided by another entity. In 1999, eight non-profit organizations were awarded 5310 funds for the Maricopa County region. Since 1983, over 100 vans have been awarded through this program.

Local. At present there are a number of locally funded programs which target transportation assistance to special populations. Some of these projects include:

- A bus system, with reduced fares for elderly and disabled individuals, and a Bus Card Plus system which allows prepaid debit cards for bus fares.

- A Dial-A-Ride system which provides ADA complimentary service.

- Vanpool and carpool programs supported by the public sector and employers.

- Payments to friends and neighbors for rides.

- Using donated bicycles.

- Maricopa County Special Transportation Services, a 70-vehicle van program operated by the Red Cross.

Figure 13-1
Potential Long Range Human Services Transportation Funding Plan[1]
(Thousands of 2001 Constant Dollars)

Program	Type	Target Population	Source[2]	FY 2000 Funding			FY 2021 Funding			FY 2001-2021 Funding		
				Available	Needed	Total	Available	Needed	Total	Available	Needed	Total
Work Links	Brokerage/ Community Bus	Low income persons[3] TANF Participants[4]	FTA Job Access	$ 1,000	$ 500	$1,500	$ 1,557	$ 778	$ 2,335	$ 26,999	$ 13,500	$ 40,499
	Only Brokerage	Low income persons TANF Participants	MAG Federal Funds	750	375	1,125	1,168	584	1,752	20,249	10,125	30,374
Wheels-To-Work	Donated Vehicle	TANF Participants	Federal TANF block grant	2,000	1,000	3,000	3,114	1,557	4,671	53,999	26,999	80,998
Elderly and Persons with Disabilities Transport-ation Program	Capital Assistance (vans)	Non-profits and local jurisdictions serving elderly and persons with disabilities	FTA Section 5310	320	320	640	498	498	996	8,640	8,640	17,280
Elderly Mobility Solutions	Older Traveler Assistance		MAG Federal Funds	0	300	300	0	467	467	0	8,100	8,100
			Total	$ 4,070	$ 2,495	$6,565	$ 6,337	$ 3,884	$10,221	$ 109,887	$ 67,364	$ 177,251

[1]Includes public regional expenditures at both the state and federal level. Does not include locally funded human services transportation projects including Dial-A-Ride, private-for-profit taxis and shuttles, medical transportation services, vanpools supported by the public sector and by employers, and carpool arrangements.

[2]It is assumed that federal transportation funding directly available to MAG will supplement existing grants to address long term funding commitments and needs.

[3]150% of Federal Poverty Level.

[4]Temporary Assistance to Needy Families.

SECTION 14

SAFETY

Ensuring high levels of safety on the regional transportation system is a primary goal of the region. This section of the Long Range Transportation Plan (LRTP) highlights safety considerations in the planning process. Safety is explicitly considered at several stages in the transportation planning process. Additionally, individual program areas such as freeways, streets, bicycles, pedestrians and ITS emphasize safety considerations.

REGIONAL SAFETY ISSUES

MAG jurisdictions continue to address local transportation safety issues mostly through locally funded programs. A number of jurisdictions have adopted a multi-disciplinary approach proven successful across the nation by emphasizing education, enforcement and engineering measures. Some of the key transportation related safety issues and needs in the region that are being addressed by MAG are described below.

Regional Transportation Safety Forum. MAG held the first Regional Transportation Safety Forum on March 15, 2001. The objectives of the forum are to identify current transportation safety issues, concerns and needs in the MAG region and to initiate a process that would seek input from regional stakeholders towards planning for a safer regional transportation system.

Regional Safety Management System. A discussion initiated at the MAG Streets Committee on the need for a Regional Safety Management System has led to the programming of FY 2005 funds for developing a Regional Safety Management System. This particular project has since then been advanced to FY 2003. The planned system will produce an annual safety report and enhance daily access to accident data.

Freeways. Reduction of crash frequency and severity is one of the criteria adopted by the MAG Regional Council in establishing priorities for the completion of the urban freeway system. Freeway safety is also enhanced through the implementation of the Freeway Management System (FMS). MAG has placed completion of the FMS as a high priority. The current FMS Alert Team's quick response to freeway accidents and incidents has helped improve the overall level of safety. MAG was successful in working with the Governor's office, Federal Highway Administration and ADOT on a countermeasure to address median cross over crashes on urban freeways. MAG regional council has approved funding for median barriers on all new urban freeways.

Freeway Service Patrol. A MAG project has launched the region's first Freeway Service

Patrol. This service involves prompt motorist assistance provided by Roadside Motorist Assistants that are driving fully equipped patrol vehicles on the regional freeway system. This services is staffed by civilian employees of the Department of Public Safety(DPS) and funded through a contract between MAG and DPS. The launching of the service and its on-going operation is currently funded for five years, with Arizona DOT funding the last three years. This service will improve overall safety on the urban freeway system. Similar patrols in other regions of the nation have proven to be extremely effective. Funds for this project have been programmed.

Streets and Intersections. Intersection and mid-block crashes is a continuing safety concern within the region. Speeding and red light running are significant safety problems. A recent study by the Insurance Institute for Highway Safety identified Phoenix as having a high accident rate based on population. A number of MAG jurisdictions have installed automated devices to address both speeding and red light running. Additionally, MAG developed and maintains the Uniform Standard Specifications for Public Works Construction for use by jurisdictions to complement other standards that ensure street safety.

Bicycles. One of the four goals of the MAG Regional Bicycle Plan is to educate bicyclists and motorists in order to increase safety on shared roads. The regional plan encourages the jurisdictions develop safe bicycle facilities. A number of MAG jurisdictions have developed their own Bicycle Plans which further address bicycle safety.

Pedestrians. Pedestrian safety and improved pedestrian facilities is addressed by the MAG Pedestrian Working Group. An update of the MAG Pedestrian Plan has recently been completed and safety as a significant factor in this Plan.

High-Risk Drivers. Both younger and older drivers are associated with elevated risks for vehicular crashes based on their involvement in crashes. Older drivers have been observed to be particularly susceptible to accidents at intersections. Safety issues are considered when existing intersections are widened and left-hand turning movements improved. The adequacy of street signs and pavement markings for older drivers in the region is another key safety issue.

Transit. Through the procurement process for transit operations, RPTA requires operators to be apprized of safety and security issues, as well as to perform multiple functions related to safety of capital equipments. Contract incentives are provided for preventable accidents. Future improvements to safety and security in transit vehicles are being addressed through RPTA's Vehicle Management System Plan.

CRASH HISTORY AND ASSOCIATED COSTS

By statutory requirement, crashes involving a fatality, injury or $500 or greater property damage are reported by law enforcement agencies to the Arizona Department of

Transportation (ADOT). The statewide crash database, Accident Location Identification Surveillance System (ALISS), is maintained by ADOT and is the primary data source on vehicular crashes. ADOT has recently begun geocoding crash data, thereby providing the ability for future Geographic Information System (GIS) based spatial analyses of crashes. Figure 14-1 shows statistics for the years 1994 -1999 on the number of crashes that occurred in the MAG region and the economic loss that resulted from these crashes. The economic cost accounts only for loss of life, injury and loss of property and does not include congestion and delay related costs to other motorists affected by crashes. These statistics indicate that between 1994 and 1999 total crashes have increased by 24% while fatal or injury crashes have increased by only 9%. More detailed information on the location of accidents is included in the MAG Management System Report which is updated annually.

Figure 14-1. Maricopa County Crash History for 1994-1999

Year	Fatal	Injury	Property Damage Only	Total	Economic Loss ($)
1994	337	27655	38781	66773	1,255,143,800
1995	417	29066	42875	72358	1,592,554,700
1996	360	28769	43867	72996	1,205,203,000
1997	372	27567	45677	73616	1,260,189,200
1998	372	28730	49293	78395	1,266,912,100
1999	394	30331	52345	83070	1,332,113,400

Source: 1994-1999, Arizona Motor Vehicle Crash Facts, ADOT

FUNDING

The Hazard Elimination Program, administered by ADOT, is a dedicated federal funding source for road safety improvements. Most MAG jurisdictions implement safety improvement projects using a combination of federal and local funds. Safety improvements are an integral part of each modal funding program.

APPENDIX A

MAG NEW FREEWAY/EXPRESSWAY PRIORITIES*

Corridor	Section	Rank Order	Completion Date	Local Acceleration
Grand	27th Ave	1	Jun-03	
Grand	91st Ave Ramps at Agua Fria	1	Jun-03	
Pima	Scottsdale Rd-Pima Rd	2	May-03	Feb-02
Red Mountain	Country Club-Gilbert	3	Jun-03	Dec-01
Squaw Peak	Bell Road-Union Hills	4	Dec-03	
Santan	Kyrene-McClintock	4	Dec-03	
Santan	Price/Santan TI, West ½	4	Dec-03	
Santan	Santan/I-10 TI, East ½	4	Dec-03	
Red Mountain	Gilbert Rd - Higley	5	May-04	Apr-03
Grand	43rd Ave/Camelback Av	6	Sep-04	
Grand	51st Ave/Bethany Home Rd	6	Sep-04	
Santan	Price/Santan TI, East ½	7	Nov-04	
South Mountain	Santan/I-10 TI, West ½	8	Dec-04	Mar-02**
Santan	Dobson Rd-Arizona AV (SR87)	8	Dec-04	
Grand	55th Ave/Maryland	9	Jun-05	
Grand	67th Ave/Northern	9	Jun-05	
Grand	75th Ave/Olive	9	Jun-05	
Red Mountain	Higley-Bush Hwy	9	Jun-05	
Squaw Peak	Union Hills-Pima(101L)	9	Jun-05	Dec-03
South Mountain	19th Av-Baseline Rd	10	Oct-05	
Santan	Arizona Av-Gilbert	11	Dec-05	
Santan	Elliot-Baseline Rd	11	Dec-05	
Red Mountain	US 60-Baseline Rd	11	Dec-05	
Grand	59th Ave/Glendale	12	Jun-06	
Santan	Power-Elliot	12	Jun-06	
Santan	Gilbert-Williams Field	13	Dec-06	
Red Mountain	Bush Hwy-University	13	Dec-06	
Santan	Williams Field-Higley	14	Mar-07	
Santan	Higley-Power	14	Mar-07	
Red Mountain	University-US 60	15	Sep-07	
Sky Harbor	University-Superior	15	Sep-07	

* Does not include segments under construction.

** Includes ramp to 40th Street

APPENDIX B

TRANSPORTATION PLANNING FACTORS

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) required MAG to address 16 planning factors in its transportation planning process. In 1998, the Transportation Equity Act for the 21st Century (TEA-21) was passed into law. TEA-21 has consolidated the sixteen planning factors into seven broad areas to be considered in the planning process. This Appendix documents how these planning factors have been considered in the MAG transportation planning process.

BACKGROUND

Section 3004 (a)3(b) of the TEA-21 specifies that, "The metropolitan transportation planning process for a metropolitan area under this section shall provide for consideration of projects and strategies that will:

(1) support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;

(2) increase the safety and security of the transportation system for motorized and nonmotorized users;

(3) increase the accessibility and mobility options available to people and for freight;

(4) protect and enhance the environment, promote energy conservation, and improve quality of life;

(5) enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;

(6) promote efficient system management and operation; and;

(7) emphasize the preservation of the existing transportation system.

The 2001 Update of the *MAG Long Range Transportation Plan* (LRTP) incorporates the work of several documents and reports particularly related to these seven planning factors including the following:

- *MAG Long Range Transportation Plan: Summary and 2000 Update*.
- *MAG 2002-2006 Transportation Improvement Program*.
- *MAG 1999 Special Transportation Needs Study*
- *Conformity Analysis of the MAG Long Range Transportation Plan Summary and 2000 Update and the MAG FY 2001-2005 Transportation Improvement Program*.
- *Conformity Analysis Appendices*.
- *MAG Regional Bicycle Plan 1992*
- *MAG Regional Bicycle Plan 1999 Update*
- *Environmental and Energy Considerations.*
- *Intermodal Facilities and Goods Movement Considerations*.
- *Supplemental Highway Considerations*.
- *Supplemental Transit Considerations*.
- *2000 Pedestrian Plan Update for the MAG Region*.

The MAG LRTP addresses all modes of transportation over a 20 year period. Planned freeway, street and transit improvements will each cost billions of dollars--individual projects can cost millions and take years to complete. Given this level of investment and the time needed to develop and implement individual projects, it is necessary that the MAG Plan maintain a reasonable level of consistency from year to year. The Plan as it exists in this Update is not only a function of the analysis undertaken this year but is the product of many reports, analyses, and decisions compiled in previous years. In this light, the planning reports listed above serve as the basis for the incremental updates of the MAG Plan over the 1993 through 2001 time frame.

SUPPORT THE ECONOMIC VITALITY OF THE METROPOLITAN AREA, ESPECIALLY BY ENABLING COMPETITIVENESS, PRODUCTIVITY AND EFFICIENCY

Transportation is a critical component of any region's economic viability. The lack of an efficient transportation system to move material, finished products and people can seriously affect the competitiveness and economic health of a region. The need for efficient transportation systems is addressed in the broader context of a Regional Vision described in the MAG sponsored Valley Vision 2025 Vision Report which was completed in January, 2000. In general, transportation improvements contribute to economic and employment goals by ensuring access to jobs and the smooth flow of goods and services. These benefits are somewhat off-set by higher taxes needed to pay for the improvements. Transportation investments also expand access to lower cost peripheral land. This can keep land values down for home buyers and employers.

Analyzing the effectiveness of transportation system performance under alternative transportation investment choices is the principal function of the MAG planning process. In road planning, traffic volumes (passengers and freight movement) are closely considered in assessing investment options. Other indicators of effectiveness considered include congestion relief, accident reductions, travel times and occupancy rates. In transit planning rider ship, coverage and hours of service are key indicators of effectiveness (i.e., service) which are regularly considered in assessing investment options. System continuity is also an effectiveness indicator that is closely considered in assisting alternative freeway, street and bicycle investments.

The cost effectiveness of alternative transportation investments are considered in the MAG Planning Process. The MAG Congestion Management System considers miles of passenger movement per dollar for each mode of transportation to the extent feasible. The MAG freeway prioritization criteria includes cost effectiveness as a factor which is operationalized as vehicle miles of travel per capita.

The financing of transportation investments are closely addressed in the MAG LRTP by developing funding plans for each mode of transportation. These funding plans were first developed for each mode in the 1993 Update and have been refined in each subsequent updates.

INCREASE THE SAFETY AND SECURITY OF THE TRANSPORTATION SYSTEM FOR MOTORIZED AND NON-MOTORIZED USERS

Safety is a critical element of each mode of transportation and Section 14 of this plan specifically addresses safety issues. Specific safety projects are addressed as part of the programming process each year.

Transit. The technical supplement document *Supplemental Transit Considerations*. describes the current transit security system and system goals. Current capital investments in security include: support items for routine activities by security personnel, facility design features to enhance security, and monitoring equipment to observe vulnerable areas. In addition, in an effort to enhance and maximize efficiency of transit system security, a number of additional purchases have been identified to better define future capital investments related to transit system security, and future goals and needs are delineated.

Bicycle. The issue of bicycle safety is addressed in the MAG Regional Bicycle Plan of 1992 and the 1999 Plan update. The plans identified on and off street bicycle facilities and recommends safety improvements including replacing conventional drainage grates with bicycle-safe grates, providing bicycle safe railroad crossings and correcting hazardous bottleneck and tapering lane areas.

Pedestrian. Safety is also a major focus of *Pedestrian Plan 2000* which update the 1993 Pedestrian Plan. The plan seeks to identify and recommend programs and actions that guide and encourage the development of pedestrian areas and facilities and ultimately increase walking as a viable mode of transportation throughout the region.

The pedestrian plan contains five goals addressing areas vital to creating a mode shift away from driving and towards pedestrians. Of these, goal number - 4"Design for People" seeks use design to allow for the safe interaction of motorists and pedestrians. Goal number 5 - "Linkage" defines a regional pedestrian network that identifies and safely links on-and off-street transportation modes with pedestrian areas and destinations.

INCREASE THE ACCESSIBILITY AND MOBILITY OPTIONS AVAILABLE TO PEOPLE AND FOR FREIGHT

The MAG Long Range Transportation Plan and Program are multi-modal and seek to enhance the availability and use of alternative modes of transportation.

Freeways. MAG has responsibilities for establishing freeway priorities. Development of the priorities were guided by criteria adopted by the MAG Regional Council in March, 1993 and include:

- Travel Demand
- Congestion Relief
- Accident Reductions
- Air Quality Improvements
- Cost Effectiveness
- Joint Funding
- Social and Community Improvements
- System Continuity and Mobility

These criteria are reflected in the LRTP and are the basis for the freeway construction priorities incorporated in Section 7 of the plan.

Streets. The MAG Regional Street Plan incorporates MAG member agency street plans. These plans include arterial streets, non access controlled State highways and non arterial streets that provide access to residents and properties. To facilitate a system of high mobility roadways, MAG has adopted a Roads of Regional Significance Concept.

Transit.

- Ridership. The ongoing planning process seeks to increase transit ridership. However, long term trends have not been favorable. At a national level prior to 1960 most transit systems were privately owned and making a profit. Currently

most transit systems are publicly owned and typically over two-thirds of the costs are publicly subsidized. Transit market share has been on a long term decline.

The Phoenix area transit system is the fourth most efficient in the nation. Additional efficiency is possible, however, major increases in transit ridesharing will require new funding. Also, given the nature of transit most of these funds will need to be for operating expenses.

- Funding. Currently most transit operating revenues in the region come from city general funds. Only a small portion of Federal funds can be used for operating expenses. A portion of MAG Federal highway funds (CMAQ and some STP funds) have been transferred through the Federal Transit Administration to purchase buses. Additional transfers would be helpful, but is limited by the need for additional operating revenues. State efforts such as LTAF and Powerball funds to expand transit services have been limited. By constitutional restriction, Arizona Highway User Funds cannot be used for transit purposes.

- System Expansion. MAG and RPTA have developed and pursued major plans for transit expansion. In 1989, approximately 70 percent of the voters of Maricopa County voted against a half-cent sales tax for a major fixed guideway system plan. In 1994, 54 percent of the voters voted against a plan that would have split a new half-cent 50/50 between freeways and transit.

  In 1996, voters in the City of Tempe approved a half-cent sales tax to improve transit services. In March of 2000, voters in the City of Phoenix approved a 0.4 cents sales tax to expand transit services. Other cities are actively considering going to the voters for a sales tax to support transit. The MAG LRTP calls for tripling transit service and this Update includes a 39 mile light rail transit system as a result of several studies being completed.

Bicycle/Pedestrian. The goals of the 1999 MAG Regional Bicycle Plan fall within the realms of engineering and planning, education, enforcement, and encouragement. Each goal lists a number of objectives that will help achieve the goal. These goals and objectives are meant to provide cities and towns within the MAG region with guidance in planning, designing, and implementing a system of internal and regionally connected bikeways that serve the daily travel needs of bicyclists. The goals and objectives also provide guidance in advancing safer operation of bicycles and promoting bicycling as a way to make daily travel trips without polluting the air or adding to congestion related to travel of single-occupant vehicles.

The four goals are of the plan are: Engineering and Planning; Education; Enforcement; and Encouragement. These goals speak to the design and placement of bicycling infrastructure. They also address the role of education to increase public awareness of bicycling as an

alternative mode of transportation. Enforcement of traffic laws encourages safe use of this mode, and encouragement speaks to the need create a positive image in people's minds of bicycling.

The 2000 update of the Pedestrian Plan contains five goals addressing areas vital to creating a mode shift away from driving and towards pedestrians. Each goal has several objectives, and each objective is linked to the action plan. The five goals are:

- Land Use — Promote and guide land use that is conducive to pedestrians and results in a mode shift away from automobiles and towards pedestrians.

- Public Awareness — Develop a variety of educational programs to promote the benefits of pedestrian-oriented design. Initiate demonstration project to illustrate these benefits using potential pedestrian demand and pedestrian design techniques.

- Funding — Provide funding for pedestrian facility development that results in walking as a key form of transportation in the region.

- Design for People — Develop, build and maintain a diversity of pedestrian facilities that recognize the region's character, variety and intensity of land use patterns, and is responsive to the region's diverse population.

- Linkage — Provide a regional pedestrian network that identifies and safely links on-and off-street transportation modes with pedestrian areas and destinations.

Freight. The efficient movement of all traffic, facilitates the movement of both freight and passengers. In projecting traffic volumes the MAG transportation models directly incorporate the demand of commercial vehicles in a special sub routine.

In October, 1998 the Valley Freight Forum was held to gather input from the freight community. The meeting was cosponsored by MAG, the Arizona Highway Users and the Arizona Motor Transport Association. The Forum offered freight transportation providers and users an opportunity to provide input on transportation needs and the expenditure of transportation funds. The ultimate goal of the Forum was to establish a method for freight interests to provide input into the transportation planning and programming process on a continuing basis.

Aviation. The 1993 MAG Regional Aviation System Plan (RASP) Update evaluated the long-term air transportation needs in the region, and recommended improvements to accommodate future demand. The Update recommendations included, among other things, construction of a third parallel runway at Phoenix Sky Harbor International Airport, redevelopment of the former Williams Air force Base into Williams Gateway Airport a civilian

airport serving commercial carriers, cargo and general aviation, and protecting the mission of Luke Air Force Base by establishing procedures to minimize interactions with military activity.

In 1996, MAG staff worked with the MAG Building Codes Committee to develop a sound attenuation ordinance for the area around Luke Air Force Base. This ordinance will help meet one of the objectives of the MAG RASP -- to preserve the military mission of Luke Air Force Base -- by reducing interior noise levels of new residences constructed within the noise contours of Luke Air Force Base. The model ordinance was approved by the MAG Regional Council in April, 1996. Subsequently several member agencies have adopted ordinances based on the model ordinance. These members include El Mirage, Maricopa County, Goodyear and Glendale.

MAG is currently in the process of updating the 1993 Regional Aviation System Plan. The update will benefit from improvements in computer modeling technology that have occurred since 1993. The plan will include a demand/capacity analysis where both annual and hourly airport capacities will be calculated. The resulting capacities will be compared with forecasts to identify potential capacity shortages.

PROTECT AND ENHANCE THE ENVIRONMENT, PROMOTE ENERGY CONSERVATION AND IMPROVE QUALITY OF LIFE

Transportation systems that protect and enhance the environment can improve the quality of life and reduce energy costs. These factors are addressed in the MAG technical supplement reports to the 1993 MAG LRTP entitled *Demographic, Economic and Land Use Considerations*, and *Environmental and Energy Considerations*. Also, the economic factors are addressed under the above headings of "Support the Economic Vitality of the Metropolitan Area, Especially by Enabling Competitiveness, Productivity and Efficiency" and "Promote Efficient System Management and Operation". Air quality issues are also extensively addressed in the MAG planning process. Refer to the separate conformity analysis document prepared for this 2001 Update of the MAG LRTP.

Energy Conservation. MAG modal plans which directly relate to energy conservation include tripling bus service, tripling dial-a-ride service, improving bicycle and pedestrian facilities, maintaining demand management programs, expanding HOV facilities and addition of freeway management system improvements. Freeway and street capacity improvements will reduce congestion and wasted energy use.

Land Use Integration. The MAG process that ensures consistency between land use and transportation plan is documented in the 1993 Update technical report entitled *Demographic, Economic and Land Use Considerations*. The following three studies by MAG quantitatively analyze the relation between urban form options and transportation impacts:

- *System Analysis Study* (1990)
- *Congestion Management System (*1995*)*
- *Urban Form Study* (1995)

Valley Vision 2025 Committee. Valley Vision 2025 is a public/private partnership initiated by MAG to form a vision of what residents want this region to become in the year 2025. The partnership is an outgrowth of citizen-based recommendations to the MAG Regional Council which call for this region to plan for the future now if it is to remain an attractive and desirable place to live. In March of 1995, the Regional Council formed the Blue-Ribbon Committee to recommend a growth planning process for the region. In December of 1997, the Regional Council had adopted the Committees recommendation and formed the Valley Vision 2025 Committee.

The Valley Vision 2025 Committee consisted of 79 leaders representing a cross-section of business, civic and community representatives from throughout the region. Over the two years that the Committee worked on the vision, hundreds of Valley residents participated in collaborative groups, a regional summit, thematic subcommittees and public forums to develop the valley vision goals for the future, based on principles, people, place, prosperity and partnerships.

The thematic subcommittee for transportation developed the following goals:

- Provide convenient access to jobs and other opportunities throughout the region by ensuring an effective transportation system and integrating transportation and land use patterns.

- Ensure mobility for all citizens, young children, students, persons with disabilities and people who cannot afford automobile travel.

- Ensure that travel is safe.

- Support a strong economy by ensuring access to jobs and the smooth flow of goods and services.

- Ensure that transportation improvements support a quality environment.

- Ensure that the transportation decision making process is responsive and accountable to public interests.

- Ensure that transportation funding is adequate and fair.

MAG will continue working on the vision in a public/private partnership to develop implementation strategies and performance measures for the goals.

Modeling. The MAG socioeconomic forecasting process starts with County control totals for population and employment which are developed by the Department of Economic Security. Key input into the forecasting process includes local land use plans which reflect "local/central city development goals (community, economic, housing, etc.)." Local land use plans also incorporate projections of "environmental protection, growth management and land use activities". MAG socioeconomic projections are the basic input into the MAG transportation models which forecasts transportation demand. The projection process is based on the MAG DRAM/EMPAL model and results are reviewed and adjusted by local officials though the MAG Population Technical Advisory committee. MAG socioeconomic forecasts focus on projections of population and employment at the Traffic Analysis Zone (TAZ) level (often this corresponds to the square mile). Other variables include household size and income.

Environment. Reductions in transportation energy use in the MAG region are closely tied to air quality goals. National standards for new cars result in less energy use and less pollution. Rigorous air quality vehicle testing programs in the MAG region help maintain these improvements.

Enhancement Funds. All TEA-21 enhancement funds in Arizona are administered by ADOT, including project selection. Fifty percent of these funds are set aside for local projects while the other 50 percent is targeted for the State highway system. MAG has established an Enhancement Funds Working Group to recommend projects for funding in the MAG region. Several projects have been selected by ADOT for TEA-21 enhancement funding in the MAG region.

ENHANCE THE INTEGRATION AND CONNECTIVITY OF THE TRANSPORTATION SYSTEM, ACROSS AND BETWEEN MODES

A transportation system that makes efficient use of multiple transportation modes can enhance a region's competitiveness in the global economy. Multiple transportation modes means more options for getting people, goods and services from one place to another. With more options, the cost of transportation in both time and money can be reduced. In 1993, MAG completed the technical working paper "Intermodal Facilities and Goods Movement Considerations." In 1995, MAG completed development of a Regional Intermodal Management System. This effort has focused on identifying intermodal terminal needs. MAG will participate with ADOT in developing a statewide Intermodal Management System that will focus on intermodal corridors.

Specific activities called out for consideration in this planning factor are also addressed in the MAG technical support document *Demographic, Economic and Land Use Considerations*. Airports, and airport access, are specifically addressed in the 1996 MAG Regional Aviation System Plan.

PROMOTE EFFICIENT SYSTEM MANAGEMENT AND OPERATION

Minimizing congestion and resulting delays is a central theme in all modal elements of the MAG LRTP. In August 1994, MAG adopted a Congestion Management System (CMS). It includes a rating system for projects that incorporates current and future congestion levels, land use planning considerations and support for multimodal projects. This system is incorporated into the MAG planning process through an annual report to member agencies and in the selection of projects for MAG Federal funding. The CMS incorporates congestion as a factor for prioritizing freeways and includes the MAG HOV Plan.

The analysis of congestion is addressed throughout the MAG planning process. The MAG transportation models are used to analyze future congestion.

Travel demand programs are part of the MAG LRTP and as air quality control measures they have a high priority for funding. MAG Federal funds are used to support these programs. MAG Federal funds are also used to support local efforts to support traffic signal enhancements and freeway management systems. A strategic plan for ITS (Intelligent Transportation Systems) has been adopted in the region, and implementation efforts are in progress.

In November 1996, a report on results of the management systems was completed and distributed to MAG member agencies. Results included (1) congestion maps, (2) congestion strategies, (3) intermodal facility needs, (4) bridge needs, (5) intersection accident rates, (6) transit vehicle needs, (7) a list of the lowest rated paving in major jurisdictions, and (8) information related to Title VI of the Civil Rights Act of 1964. Results were used by member agencies to develop, select, prioritize, and submit projects for local and Federal funding in the MAG TIP and LRTP. Projects submitted to MAG were rated by an air quality rating system and a congestion management rating system.

EMPHASIZE THE PRESERVATION OF THE EXISTING TRANSPORTATION SYSTEM

Infrastructure maintenance is a critical part of any transportation system. Ongoing effective maintenance of transportation infrastructure can prolong the life of the physical plant and allow longer periods before substantial capital costs for replacement structures is needed. Maintenance and operating costs for streets and transit are part of this 2001 Update, and are reflected in the financial plans for each mode. Maintenance costs for freeways are a State responsibility. These costs are addressed in the ADOT *Needs Assessment Study*.
Operating, maintenance and capital costs are considered in developing the funding plans for the MAG LRTP. Life Cycle costing is often used at the project level. The Transit, Bridge, and Pavement Management Systems directly address life cycle costs. In the design of high volume roadways careful consideration is given to the trade off between asphalt and concrete. Buses are purchased on a life cycle basis.

APPENDIX C

TREND FUNDING STRATEGY

The strategy for funding the MAG Long Range Transportation Plan (LRTP) is to maintain current (or equivalent) funding sources at historic per capita levels. Most of the funding sources for the MAG LRTP require periodic action to continue or to adjust for inflation. The MAG strategy to maintain a trend level of funding commitment to transportation includes the following basic elements.

- Maintain an updated Long Range Transportation Plan for the region.
- Provide numerous opportunities for public input.
- Inform the public and elected officials of transportation needs and benefits of the Plan.
- Support periodic legislative and referendum actions to maintain trend levels of transportation funding.

FUNDING SOURCES

Funding for the MAG LRTP is provided by several sources. A few of these sources have the potential to adjust for inflation and growth, such as the Vehicle License Taxes (VLT) and sales tax revenues. However, most of the funding sources as described in the following paragraphs require periodic actions to continue at existing per capita levels.

Fuel Taxes. Taxes on fuel in Arizona are levied in terms of cents per gallon. As vehicles become more efficient and as inflation occurs, this funding source slowly erodes. In the past, legislative action has been taken periodically to increase per gallon fuel taxes to maintain a consistent level of funding from this source.

The funding plan for the MAG LRTP is based on these types of adjustments continuing in the future. However, adjustments may not take the same form as in the past as the passage of Proposition 108 in 1992 now requires a two-thirds vote by the legislature to increase taxes. This Plan assumes periodic increases in the fuel tax and assumes that all fuel taxes are indexed for inflation after 2002. Regional or State sales taxes could also raise the equivalent of this funding source.

Fuel tax revenues are the principal element of Highway User Revenue Funds (HURF). In the MAG LRTP trend HURF revenue adjustments are needed to support street plans and to complete planned improvements to existing freeways.

General Funds. City general funds are used to complete street projects and to provide transit services. These funds are incorporated into five year programs and approved on an annual basis by city and town councils. A continuation of these general funds is assumed as a portion of the funding plans for the street and transit element of the MAG LRTP.

Federal Funds. The Federal funding program is periodically reauthorized and adjusted by Congress. The last reauthorization was the Transportation Efficiency Act for the 21st Century (TEA-21) which will end at the end FY 2003. The funding plan for the MAG LRTP assumes that formula Federal funding will continue for transportation but at a declining rate in terms of constant dollars. However, opportunities for additional federal discretionary funds, especially in the area of transit, will continue to be pursued.

In the MAG LRTP, federal funds are planned to support a portion of bus service and 50 percent of the capital costs of the fixed guideway starter corridor. A major portion of MAG Federal funds are committed to new freeways, while smaller amounts are typically programmed for transit, street, bicycle and pedestrian projects.

Arizona Department of Transportation (ADOT) Discretionary Funds. These funds include HURF and federal funds that ADOT can spend anywhere in the State. The MAG LRTP relies on a fair share of these funds being allocated to the MAG region.

Transportation Sales Tax. In 1985, voters of Maricopa County approved a half-cent sales tax for 20 years to complete the planned freeway system. This referendum also included $5 million per year for transit. This tax will expire in 2005. In 1994, voters of Maricopa County rejected a proposal to add a half-cent sales tax split evenly between freeways and transit, and to extend the existing half-cent sales tax to complete planned freeway.

Because of freeway deletions and the time horizon extensions, revenues are currently adequate to complete the planned freeway system. Long range transit plans require the equivalent of a quarter-cent sales tax regionally and a quarter-cent locally from cities with light rail transit facilities.

Developer Contributions. Exactions and developer fees are used to pay for local streets and a significant portion of new arterial street construction. These contributions are projected to continue in the future.

STRATEGY

MAG serves as the Metropolitan Planning Organization for this region. It does not have the authority to approve tax increases and it does not have the authority to conduct an election campaign to approve a referendum. The MAG strategy for funding the LRTP is focused on developing technically sound plans that reflect community interests.

Transportation Planning. Transportation improvements require long term and ongoing funding commitments. For voters and elected officials to make funding commitments of this magnitude, sound transportation plans and planning procedures are required. The MAG Transportation Planning Process is required to be certified by the U.S. Department of Transportation (USDOT). In April 2001, MAG was certified by the USDOT.

The MAG LRTP is continually being analyzed and adjustments are usually made annually. MAG transportation planning is multimodal and closely integrated with land use and air quality planning. Planning is supported by state of the art computer models and completed in accord with all Federal and State requirements.

A legislative performance audit in 1991 implemented numerous changes to enhance the MAG freeway program. The ADOT Life Cycle Office and the MAG Fiscal Analysis Unit were established to ensure that costs and revenues are kept in balance. Responsibilities were clarified with MAG being assigned responsibilities for setting freeway priorities and approving material cost increases. The Right-of-Way Acquisition Advisory Panel was established to provide more oversight of major right-of-way purchases. In addition, the Citizens Transportation Oversight Committee (CTOC) was formed to provide more input and review of regional transportation decisions.

Public Involvement Process. An extensive public involvement process has been adopted to secure public comments on updates of the LRTP. Early, mid-phase, final and continuous public involvement opportunities are provided. These public involvement opportunities are extensively advertised and held throughout the region. Final public comments are reviewed, responded to and conveyed to members of the Regional Council and Federal officials.

The 2001 Update included an enhanced outreach process and the development of early guidelines to facilitate project selection. In addition to open houses, the enhanced outreach process included targeted outreach to public and private sector transportation stakeholders and focus groups conducted at five locations throughout the region. Based on input received from the enhanced outreach process, guidelines were developed and adopted by the Regional Council for consideration in the process of selecting projects to be federally funded.

MAG periodically conducts public opinion surveys on transportation issues. It also reviews the results of related public surveys conducted by other organizations. Annual adjustments to the Plan provide timely opportunities to respond to technical changes as well as evolving public opinion. Major opportunities for public feedback on the MAG Transportation Plan were provided in 1985, 1989 and 1994 when elements of the Plan were presented to the voters of Maricopa County for funding approval. Subsequent to the defeat of Proposition 400 in 1994, Plan adjustments have been made. In the future, voters are likely to again be requested to consider funding for the MAG LRTP whether at the local, regional or state level.

Needs and Benefits. In order for voters and elected officials to support funding for transportation, the need for and benefits of transportation improvements need to be clearly

identified. The MAG Plan identifies what transportation projects and services will be provided given specific levels of funding.

Section Four of this report, the MAG Transportation Management Systems Report and the related Conformity Analysis Report detail the need for this Plan, as well as its benefits. Ongoing transportation improvements in the Valley are primarily needed to keep pace with growth. Over the life of this Plan, resident population in Maricopa County is projected to increase almost 53 percent, while regional travel is projected to increase almost 63 percent. In response to this growth, the MAG LRTP calls for a doubling of freeway and expressway miles, a 55 percent increase in street miles and more than a tripling of bus services. With these improvements average traffic speed is projected to remain about the same as today and the percentage of congested freeway lane miles in the PM peak hour is projected to increase from 13 to 16 percent. Without the planned improvements (No-Build) speeds are projected to decline to 16 miles per hour and the freeway lane miles with PM peak hour congestion is projected to increase from 13 percent to 42 percent.

FEDERAL REQUIREMENTS

Section 450.322(11) of the Code of Federal Regulations requires a financial plan for the MAG LRTP. This Plan needs to include "existing and proposed funding sources that can reasonably be expected to be available". "Proposed new revenue . . . shall be identified including strategies for ensuring their availability for proposed investments." The MAG LRTP includes a financial plan for each mode of transportation, and this Appendix outlines a strategy to ensure these revenues. The financial plan calls for the historic continuation of existing sources. For example, Federal guidelines specifically identify the historic continuation of Federal funds as an existing revenue source rather than a new revenue source:

> "Where the transportation plan or TIP period extends beyond the current authorization period for Federal program funds 'available' [existing] funds may include an extrapolation based on historic authorization of Federal funds that are distributed by formula."

Federal officials have offered the following guidelines for new funding sources.

> "The financial plan must identify strategies for ensuring their [new funding] availability. It is expected that the strategies, particularly for new funding sources requiring legislation, voter approval or multi-agency actions, include a specific plan of action that describes the steps that will be taken to ensure that the funds will be available within the time frame shown in the financial plan."

Federal officials have also provided the following guidelines as to what should not be considered "reasonably available" new funding.

> "The following are examples of specific cases where new funding sources should not generally be considered to be 'reasonably available': (1) past efforts to enact new

revenue sources have generally not been successful; (2) the extent of current support by public, elected officials, business community and/or special interests indicates passage of a pending funding measure is doubtful; or (3) no specific plan of action for securing the funding source and/or other information that demonstrates a strong likelihood that funds will be secured is available."

RECENT ACTIVITY

Potential "new" funding sources under consideration are actually variations of historic sources needed to maintain a trend level of commitment to meet ongoing regional transportation needs in this high growth area. This 2001 Update of the MAG LRTP is structured around the adjustment of statewide fuel taxes to meet planned road needs and local sales taxes to meet transit needs. However, a wide variety of funding options are under active consideration. The level of activity and concern demonstrates that the funding levels need to complete the LRTP are reasonably feasible.

Vehicle License Tax Transfer. The Vehicle License Tax was approved in 1940 in lieu of an ad valorem property tax on automobiles. As the Vehicle License Tax (VLT) was collected in lieu of property tax, resulting proceeds were largely returned to cities, towns and counties to be used for general fund purposes such as, police, fire and parks. Various studies and recommendations have proposed that a larger share of these taxes be applied to transportation needs. In 1998, a portion of the VLT tax was set aside for transit.

Fuel Tax Increase. The ADOT Board has regularly raised concerns about the needs for additional revenues to maintain the state highway system. In November 1996, the MAG Regional Council passed a motion to support ADOT in addressing statewide transportation funding needs. Additional bonding capacity to accelerate freeway completion has been approved.

Sales Tax on Fuel. Options to extend the current State sales tax (now at 5 percent) to fuel have been discussed. This has the advantage of automatically adjusting for inflation although fuel price can vary substantially. Taxing options include tax on gasoline, tax on use fuel, and sales tax on the State and Federal fuel tax. Distribution options include returning to source and allocation based on population. Under the Arizona Constitution taxes on fuels must be applied to roads. However, VLT taxes can be used for transit. A transfer mechanism with HURF VLT taxes may be possible.

Local Transit Sales Tax. In 1996, the voters of Tempe approved a half-cent sales tax for transit. And in March, 2000 the City of Phoenix approved a 0.4 cent sales tax for transit. In 1998, voters in the City of Mesa approved a half-cent sales tax, a small portion of which will go to transit improvements. Other cities are actively pursuing sales taxes for transit improvements.

Tolls. ADOT has the authority to approve toll road proposals from the private sector. However, proposals to date have not proven successful. In 1993, MAG approved a resolution

to endorse an ADOT application for federal assistance to test the feasibility of tolls for single occupant vehicles on High Occupancy Toll lanes within the MAG Freeway System. Currently, MAG and ADOT are jointly sponsoring a study regarding tolling the excess capacity of HOT lanes in the region.

State General Funds. In 1996, a special Governor's Task Force completed a study on Alternative Transportation Systems. This study called for State General Funds to be used for transit improvements.

APPENDIX D
COSTS FOR PLANNED IMPROVEMENTS TO EXISTING FREEWAYS AND REGIONAL ACCESS ROUTES

Corridor	Limits	Description	Millions of 2000 Dollars
2002 to 2007			
Black Canyon	Cactus Road, Deer Valley and Greenway Road/a	Traffic Interchange Improvements	$6.2
	Peoria Avenue to Greenway Road/a	Construct Auxiliary Lanes	$8.5
	Carefree Highway to Pima Freeway/a	Design for Widening	$5.0
Interstate 10 South	10: Maricopa Rd TI to Riggs Rd/a	Design roadway	1.2
	Riggs Road TI/a	Traffic Interchange Improvements	0.8
Interstate 10 West	Litchfield Rd TI/a	Traffic Interchange Improvements	0.4
	Airport Rd, Watson Rd and Bullard Ave/a	Construct Traffic Interchanges	17.2
Interstate 17 North	Carefree Highway TI/a	Reconstruct Traffic Interchange	8.8
	Daisey Mountain TI /a	Construct Traffic Interchange	18.0
Maricopa	44th Street to Baseline Road/a	Construct Collector Distributor Roadways, Phase 1	127.0
	Warner Rd TI/a	Traffic Interchange Improvements	0.2
	Ray Rd TI/a	Traffic Interchange Improvements	4.2
Squaw Peak	Indian School Rd to Bethany Home Rd/a	Construct Drainage Improvements	2.8
	McDowell Rd to Shea Blvd/a	Construct HOV Lanes	34.3
	Interstate 10/a	Construct HOV Ramps	24.3
State Route 85	I-10 to MC 85/a	Widening	71.9
Superstition	Widening, I-10 to Val Vista/b	I-10 Connector Ramps, HOV lanes I-10 to Val Vista, General Purpose Lanes Price to Val Vista	272.6
	Val Vista Dr TI/a	Traffic Interchange Improvements	5.4
	Stapley Dr TI/a	Traffic Interchange Improvements	0.9
	Gilbert Rd TI/a	Traffic Interchange Improvements	8.0
	Higley Rd TI/a	Traffic Interchange Improvements	7.4
	Mesa Dr TI/a	Traffic Interchange Improvements	2.1
	Val Vista Dr to Power Rd/a	Design Widening	0.3
US 60 Northwest	Morristown Overpass to 203rd Avenue/a	Construct Roadway	20.8
Systemwide/c	MAG Region	Maintenance and Small Projects	$1,556.8
		Subtotal	**$2,205.0**
2008 to 2021			
Black Canyon	Thomas Road to Thunderbird Road/d	Ultimate Widening	642.9
Interstate 10 South	Maricopa Road to Riggs Road	Widen roadway	48.8
Interstate 17 North	Carefee Highway to Pima Freeway	Widen roadway	80.0
Maricopa	16th Street/Buckeye Road to Baseline Road	Construct Collector Distributor Roadways, Phase 2	132.9
Squaw Peak	Shea Boulevard to Pima Freeway	Construct HOV lanes	24.0
State Route 85	South of Prison	Widen roadway	73.1
Superstition	Design Build, Val Vista to Power/e	Construct general purpose lanes and HOV lanes	90.0
	Power Road to Santan Freeway/f	Construct HOV lanes	21.7
Systemwide/c	MAG Region	Maintenance and Small Projects	$3,035.8
		Subtotal	**$4,149.2**
		Total	**$6,354.2**

a/Based on FY 2002-2006 MAG Transportation Improvement Program

b/Based on ADOT cost estimates as of 1/14/2000. Includes $10.9 million of loan advancement from the City of Mesa.

c/Includes a share of ADOT annual budget (administration, operations and maintenance), small projects in Maricopa County and a a share of the Statewide Lump Sum category in the Five-Year Program.

d/Based on the I-17 System Design/Operations Study (ADOT, December 1990). This estimate excludes interchange improvements that have have been implemented, but assumes that current HOV improvements are largely throw away. Costs have been updated for inflation and have been increased by 25 percent to account for right-of-way cost increases in the corridor.

e/Based on ADOT cost estimates to construct HOV and general purpose lanes from Val Vista to Power as of 9/15/1999.

f/Based on ADOT cost per mile estimates to construct HOV lanes from Val Vista to Power as of 9/15/1999 ($10.535/mile).

APPENDIX E

A RESOLUTION OF THE MARICOPA ASSOCIATION OF GOVERNMENTS FOR THE DESIGNATION OF THE CANAMEX CORRIDOR THROUGH THE MARICOPA REGION

WHEREAS, the Maricopa Association of Governments (MAG) and the Arizona Department of Transportation (ADOT) recognized the need to analyze alternatives for a designated route through the Maricopa region for the CANAMEX Corridor, and accordingly conducted a study to identify a corridor,

WHEREAS, on November 1, 2000, following the recommendations of the MAG-ADOT study, the MAG Regional Council passed a resolution for the Corridor as follows: "BE IT RESOLVED that the Maricopa Association of Governments recommends the future designation of the CANAMEX Corridor within the Maricopa region to include I-8 between I-10 and SR 85, SR 85 between I-8 and I-10, and the US 93 / US 60 Wickenburg Bypass, with the connection between the SR 85 / I-10 junction and the Wickenburg Bypass to be designated following additional study but constrained to a location outside of the air quality nonattainment area for particulate matter under ten microns in diameter (PM-10) as specified in the "Revised MAG 1999 Serious Area Particulate Plan for PM-10 for the Maricopa County Nonattainment Area" (February 2000)",

WHEREAS, the development of a recommendation for the remaining portion of the corridor, namely that between the SR 85 / I-10 junction and the Wickenburg Bypass, required additional stakeholder and public consultation as well as further agency review, study and consideration, involving the Maricopa County Department of Transportation (MCDOT) as the owner of the routes under consideration for the corridor in this area,

WHEREAS, to that end, MAG, ADOT and MCDOT have jointly conducted additional consultation and review, considering alternatives involving the Sun Valley Parkway, Wickenburg Road / Vulture Mine Road (to the Wickenburg Bypass), and Eagle Eye Road, with the following key results:

- Significant opposition to consideration of the Sun Valley Parkway alternative for designation as part of the CANAMEX Corridor was heard, including from elected officials representing the Town of Buckeye, and landowners and their representatives in the vicinity of the Sun Valley Parkway alternative,

- Representatives of the Town of Wickenburg indicated support for an alignment in the vicinity of the Wickenburg Road / Vulture Mine Road alternative,

- Eagle Eye Road is considered too far west to be a cost-effective alternative, given its greater travel distance relative to the other alternatives. Additionally, Eagle Eye Road does not connect to any of the alternatives under consideration for the Wickenburg Bypass,

WHEREAS, a timely resolution is needed in order to provide certainty to the public and to MAG member agencies as to which route is being designated and which routes are no longer being considered for the CANAMEX Corridor,

WHEREAS, both the Sun Valley Parkway and Eagle Eye Road alternatives should be eliminated from further consideration for designation as part of the CANAMEX Corridor, given the significant deficiencies associated with each of these alternatives,

WHEREAS, an alignment in the general vicinity of Wickenburg Road and Vulture Mine Road, connecting to the future Wickenburg Bypass, is the preferred alignment for designation as part of the CANAMEX Corridor,

WHEREAS, Wickenburg Road and Vulture Mine Road currently are not constructed to design or operational standards established for the CANAMEX Corridor or at a minimum to standards suitable for significant truck traffic, and are not being considered for addition to the State Highway System unless and until funding is available for upgrades to the appropriate standards,

WHEREAS, a resolution by MAG supporting an alignment in the general vicinity of the Wickenburg Road/ Vulture Mine Road alternative, and allowing for further detailed study of this segment as appropriate by ADOT and/or MCDOT, and involving MAG as appropriate, would provide the needed certainty,

BE IT RESOLVED, that the Maricopa Association of Governments recommends that the designation of the CANAMEX Corridor within the Maricopa region include the following segments: I-8 between I-10 and SR 85; SR 85 between I-8 and I-10; I-10 from SR 85 to a Wickenburg Road connection; an alignment in the general vicinity of Wickenburg Road and Vulture Mine Road that connects to the future US93/US60 Wickenburg Bypass, the specific alignment of which is to be determined following the completion of needed studies by ADOT; and the future US93/US60 Wickenburg Bypass from its junction with Vulture Mine Road to US 93.

And the Wickenburg Road / Vulture Mine Road alignment shall not become eligible as a state route unless and until its design, right of way acquisition, construction and operation have been fully funded.

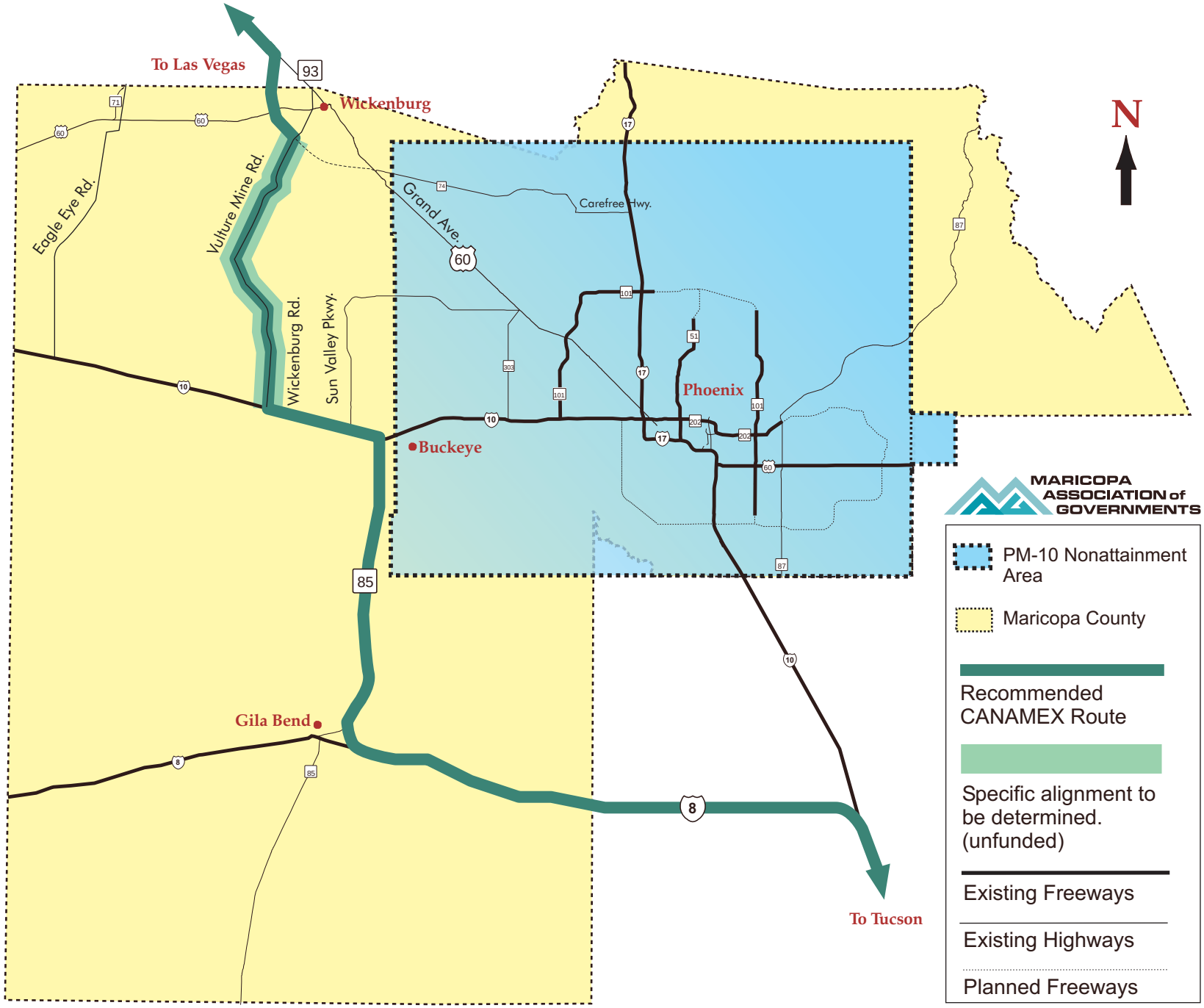
BE IT FURTHER RESOLVED, that the Maricopa Association of Governments recommends that the Sun Valley Parkway and Eagle Eye Road be eliminated from further consideration for designation as part of the of the CANAMEX Corridor through Maricopa County.

PASSED AND ADOPTED BY THE REGIONAL COUNCIL OF THE MARICOPA ASSOCIATION OF GOVERNMENTS THIS 25TH DAY OF APRIL 2001.

Mayor Skip Rimsza, Chairman
MAG Regional Council

ATTEST:

James M. Bourey, Secretary
MAG Executive Director



Recommended Designation of the CANAMEX Corridor through the Maricopa Region