

MAG COMMUTER RAIL STRATEGIC PLAN

EXECUTIVE SUMMARY 2008

COMMUTER RAIL STRATEGIC PLAN OVERVIEW

Since the early 1980's, jurisdictions in the Phoenix metropolitan area have considered the possibility of operating passenger rail service on the existing freight rail lines to serve longer trips between activity centers. Although some of these lines were previously used for passenger service, all of the lines in operation today provide freight service. The last passenger rail service in Phoenix was operated by Amtrak and ended service in the mid-1990s. Commuter rail service was also operated for several months from Mesa to downtown Phoenix in 1982 following flooding along the Salt River that destroyed bridges and at-grade roadway crossings.

Over the next twenty-five years, Maricopa and northern Pinal County are projected to nearly double in population, with an anticipated total of 7 million people in 2030. Developing a commuter rail system will provide an alternative transportation mode to meet travel demands resulting from expected growth in Maricopa County and northern Pinal County. This anticipated growth will put additional strain on an already congested transportation system, cause additional air quality concerns, and further challenge transportation funding sources of the region.

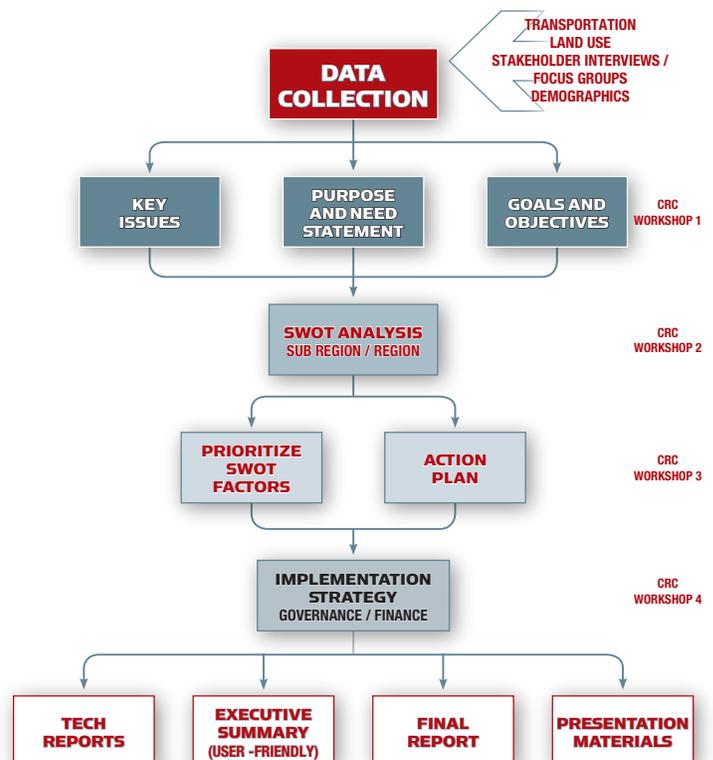
Previous studies including the Maricopa Association of Governments (MAG) High Capacity Transit Study (2003) showed that commuter rail service operating on freight rail lines could offer an alternative transportation mode in congested primary corridors in the region. As part of the overall plan to fund the region's transportation needs over the next 20 years, Proposition 400 was approved by voters in November 2004 and allocated a portion of sales tax revenues to study the options for commuter rail.

The Commuter Rail Strategic Plan was initiated by MAG to define the requirements and steps that will need to be

followed for Maricopa and northern Pinal Counties to plan for and potentially implement commuter rail service. The one-year planning and stakeholder coordination process commenced in February 2007.

Several organizations and groups contributed to the development of the Strategic Plan including MAG, Pinal County, the Arizona Department of Transportation (ADOT), Metro Rail (METRO), the Regional Public Transportation Authority (RPTA) and the Commuter Rail Stakeholders Group (CRSG). The planning process is illustrated in Figure 1.

FIGURE 1: PLANNING PROCESS

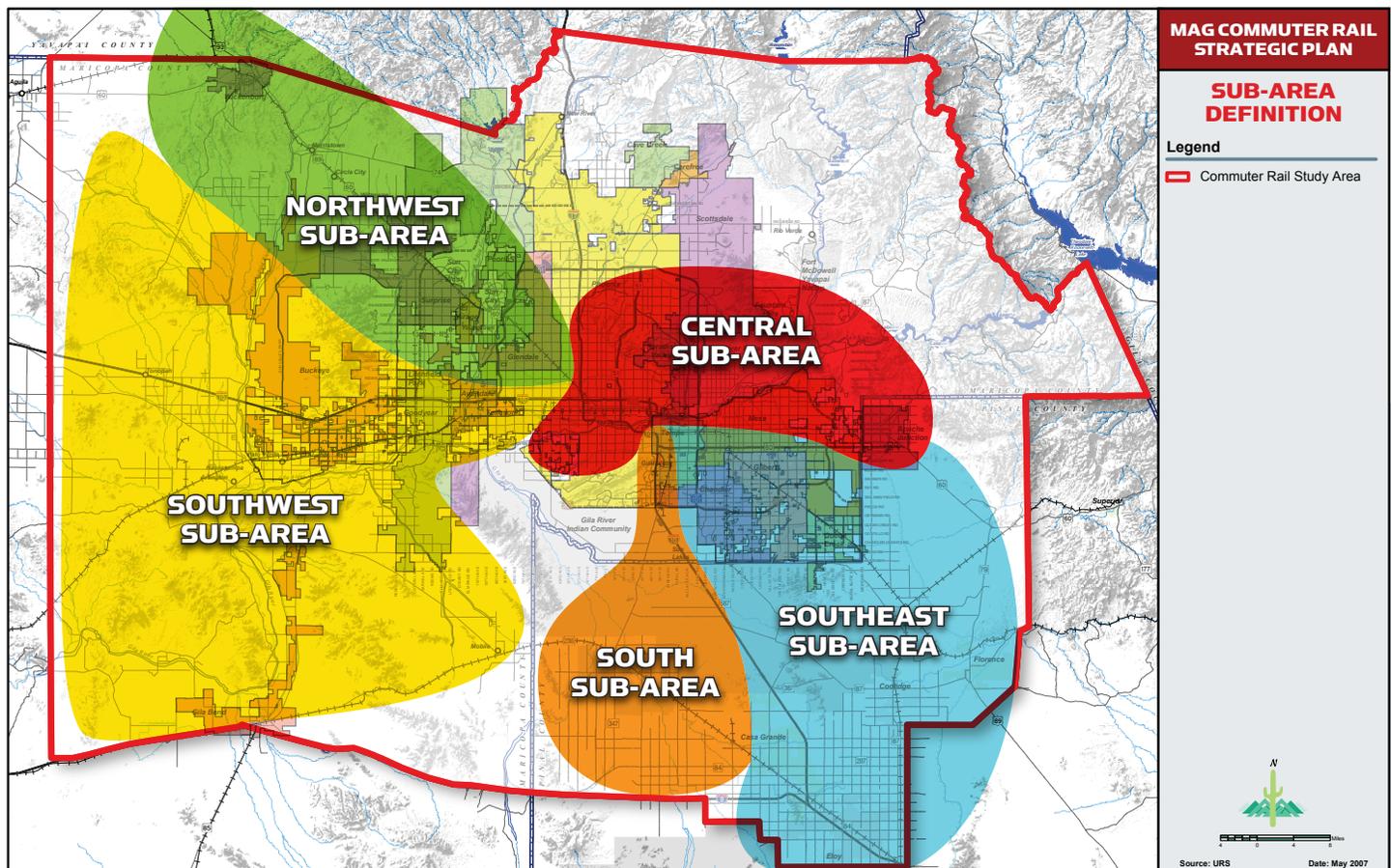


COMMUTER RAIL STAKEHOLDERS GROUP

A Commuter Rail Stakeholders Group (CRSG) was established to comment on, and help shape, major policy recommendations for implementing commuter rail in the study area. The CRSG consists of public and private agencies and entities with interest in determining how to implement Commuter Rail services in the region.

The CRSG met four times throughout the course of the project to assess information and provide input to shape major policy recommendations. In addition, the CRSG helped define smaller geographic study areas to focus stakeholder involvement and create a sense of community building and linkages as part of this regional planning effort. These sub-areas consist of the Southwest, Southeast, Northwest, Central, and South corridors. Figure 2 depicts the location of all five sub-areas. Union Pacific and BNSF Railway both own rail lines in portions of these sub-areas.

FIGURE 2: SUBAREA DEFINITION



NEED FOR COMMUTER RAIL IN MARICOPA AND NORTHERN PINAL COUNTIES

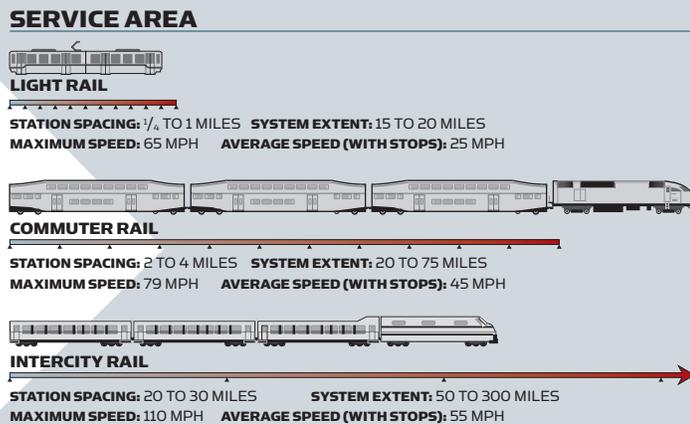
Projected growth in the region combined with fundamental constraints on the ability of highway improvements alone to accommodate this growth have created greater interest in providing travel alternatives to the automobile. As indicated by the passage of Proposition 400, there is a growing public acknowledgement that both highway and transit improvements are needed to address the future demands as part of a **"shared solution"** to provide for the safe and efficient movement of people and goods within the region. The potential development of a commuter rail system could offer a travel alternative for some congested corridors within the region and could also support economic development in the Phoenix metropolitan area.

Commuter rail can serve high volumes of travelers taking longer trips during rush hour periods. Commuter rail is an important part of the transportation system in many large

western cities such as Los Angeles, San Diego, Albuquerque, and Seattle and will be opening in Salt Lake City in 2008. Commuter rail is also a vital part of the transportation system in many mid-western and eastern cities; serving trips from outlying suburban areas into the center of the region for work, education and other purposes. Working with the highway system, High Occupancy Vehicle facilities and other transit improvements such as Light Rail Transit (LRT), Bus Rapid Transit (BRT) and local bus services, commuter rail can serve the longer trip needs as part of an overall regional transportation network.

Key differences between commuter rail service and other types of rail transit are shown in Figure 3.

FIGURE 3: TRANSIT COMPARISONS



POPULATION GROWTH

Continued urban growth in the outlying areas of Maricopa County and nearby Pinal County will dramatically increase travel demands throughout the region. Maricopa and northern Pinal Counties are projected to nearly double in population from the 2005 base of 3.9 million to 7.0 million people in 2030, an increase of 82%.

REGIONAL TRAVEL DEMAND

In many parts of the region, affordable housing is being built farther away from the major employment centers such as Downtown Phoenix, north Central Avenue, the Sky Harbor Airport complex and Tempe/ASU. This results in heavy travel demand that are focused along the major highway corridors of Interstate 10, US 60, Grand Avenue, and State Routes 101 and 202.

TRAFFIC CONGESTION

Today, many of the major highways in the region operate at poor levels of service during peak travel periods. This congestion is expected to worsen over the next 25 years. Travel times are already more than an hour each direction for many commuters, and with frequent incidents, travel times become much longer. The increased demand will further diminish the reliability of the highway system for autos and buses. Commuter rail service could offer higher speeds for trips over 25 miles in length and offer more reliable travel times because trains do not compete with automobile traffic.

EXISTING RAILROAD LINES

Topographic barriers to development of new and expansion of existing transportation facilities exist in the area such as mountains, rivers, and sensitive environmental habitat areas. Jurisdictional boundaries including State and Federal Lands and Indian Reservations also pose challenges in implementing new transportation corridors that require development on new right-of-way. Therefore, consideration of the use of existing freight rail lines for future commuter rail service in partnership with the private railroad companies offers an alternative that may be more quickly implemented.

INTERCITY RAIL SERVICE

The State of Arizona continues to investigate the potential for intercity rail service between Phoenix and Tucson, expanding to other parts of the state over time. Ongoing studies have defined possible facilities and operating strategies that could be used in conjunction with a regional commuter rail system. Cooperative planning and partnership with the freight railroad companies may offer combined benefits for passenger rail services.

COMMUTER RAIL?



Commuter Rail service is typically provided between a central city and adjacent suburbs using railroad passenger cars. Propulsion is either conventional push-pull locomotives or self-propelled diesel multiple unit

cars. In push-pull service, the locomotive pulls the train in one direction and pushes the train in the opposite direction.

The commuter coach cars can be either single-level or bi-level in configuration. The number of seated passengers per car ranges from 80 to 150 depending on the configuration of the car.

Maximum train speeds for typical commuter rail cars are between 60 and 80 miles per hour. The train speed varies depending on number of stations, track condition and alignment, and local ordinances. At-grade roadway crossings would be protected by appropriate warning devices and operating procedures.

Stations could be spaced as frequently as every two to four miles, or spaced up to 10 miles apart depending upon travel demands. As a collection point for commuters, parking and bus transfer facilities would be provided. Because these locations could serve as a focal point from which to make connections to other parts of the region, joint development of more intensive land uses could be supported.

BENEFITS OF COMMUTER RAIL

Commuter rail service has the potential to carry a substantial number of passengers during peak periods over longer distances and with reliable travel times other surface transportation modes. These features are important to provide relief to congested travel corridors.

Carry longer trips in congested corridors

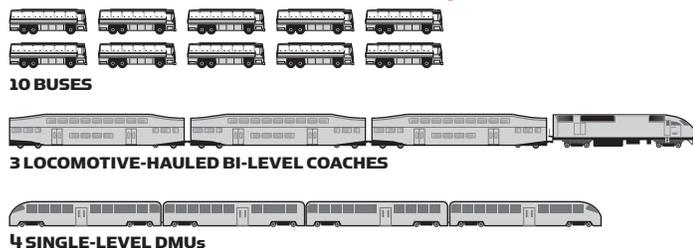
Commuter rail is more efficient for longer trips when compared to other modes of travel such as LRT, BRT or by express buses.

Figure 4 illustrates the cost-effective considerations in moving passengers longer distances than smaller transit vehicles.

FIGURE 4: COMMUTER RAIL EFFICIENCY

COMMUTER RAIL IS MORE EFFICIENT FOR LONGER TRIPS

TO CARRY 300-400 PASSENGERS REQUIRES:



Offer relief in peak periods

Because commuter rail is separated from the roadway and not impacted by motor vehicle congestion or accidents, it can offer efficient and reliable travel times. Implementation of commuter rail could save travel time and remove automobiles from the highway system, ultimately helping to reduce peak period congestion and helping to improve air quality for the region.

Offer connections to other modes

The implementation of commuter rail can maximize intermodal transportation opportunities by locating stations to connect with local transit, airports, and highways.

Commuter rail could improve travel options available in Pinal County and other developing outlying areas of the state that currently have limited bus, rail, and air service for intercity trips.

Provide Service to Urban Centers

Commuter rail could create social benefits by enhancing and strengthening urban centers. In combination with appropriate local land use policies, the increased accessibility afforded by the commuter rail service could encourage more intensive development and may lead to higher property values around stations.

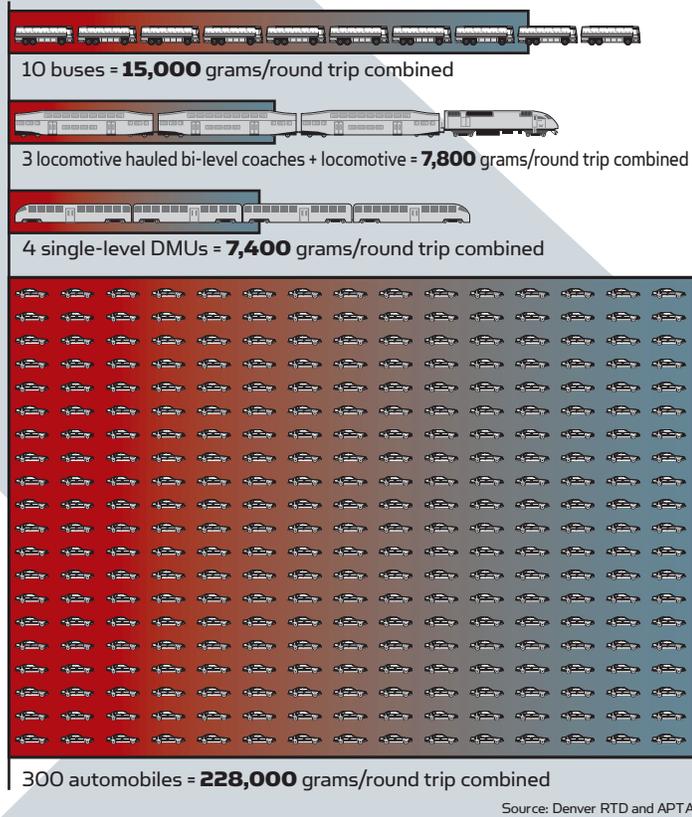
Support Community and Regional Plans

The implementation of commuter rail in the Maricopa and northern Pinal region is highly compatible with local General Plans for communities along the existing freight lines.

In addition, use of commuter rail could reduce overall automobile vehicle-miles of travel in the region. For each commuter rail car operating at seating capacity, between 9,000 and 10,000 vehicle miles traveled (VMT) could be eliminated each day. Reduced VMT saves energy, air pollutant emissions and can help reduce peak period congestion on parallel highways.

The implementation of commuter rail could decrease emissions by reducing pollution generated by automobile combustion engines. The following graphic illustrates the overall net benefit to regional air quality for commuter rail due to reduction in regional VMT. Three locomotive hauled

bi-level coaches have the same capacity as 300 automobiles, carrying 300-400 passengers, 50 miles round trip. By reducing the number of automobiles, total emissions of PM₁₀, NO_x and CO would be reduced.



COMMUTER RAIL STAKEHOLDERS GROUP PROCESS FINDINGS

The MAG Commuter Rail Strategic Plan process supported outreach efforts of the Commuter Rail Stakeholders Group (CRSG) in regularly scheduled meetings and workshops.

Specifically, the CRSG began their work by analyzing strengths, weaknesses, opportunities, and threat (SWOT) issues by subarea. This analysis examined connectivity, land use, capacity requirements, and other commuter rail related issues from a corridor or localized standpoint. The SWOT analysis also helped to develop project goals and objectives.

Action plans, related to the identified commuter rail goals and objectives we also developed by the CRSG. These action plans were incorporated into the development of

the implementation strategy for commuter rail in Maricopa and Pinal County.

There were several key issues identified throughout the CRSG process. These key issues include:

- ➔ Continued regional growth of population and employment throughout the metropolitan area.
- ➔ Availability of existing railroad alignments in the primary travel corridors.
- ➔ Increase in the cost of fuel and travel.
- ➔ Need for environmental sustainability by reducing air pollutants and usage of natural resources.
- ➔ Need for cooperation between public and private entities. Such as government agencies and private railroad companies.

Using the key issues as a base, the CRSG also identified challenges to implementing commuter rail in the region:

- ➔ Possible conflicts with current and planned freight railroad operations.
- ➔ Rapid development of land uses foreclosing opportunities for alignments and stations.
- ➔ Physical and geographic constraints limit locations for new alignments.
- ➔ Coordination with jurisdictional interests and policies.
- ➔ Availability and competition for regional, state and federal funding and resources.
- ➔ Cost of building and operating a commuter rail system within the context of other planned improvements.

OTHER WESTERN CITIES WITH COMMUTER RAIL

- Albuquerque, NM RailRunner
- Dallas, TX Trinity Railway Express (TRE)
- Los Angeles, CA Metrolink
- San Diego, CA Coaster
- Salt Lake City, UT Front Runner (April 2008)
- San Francisco, CA CALTRAIN
- Seattle, WA Sounder

COMMUTER RAIL STRATEGIC PLAN GOALS AND OBJECTIVES

The following goals were developed by the CRSG and served as guiding principles for the MAG Commuter Rail Strategic Plan.

Goal 1- Employ Commuter Rail to Shape Regional Growth

Objective 1: Reinforce multi-centered development

Objective 2: Stimulate economic development

Objective 3: Spur development in Urban Centers

Goal 2- Improve Transportation Mobility Opportunities by Implementing Commuter Rail

Objective 1: Provide multimodal travel options in congested travel corridors

Objective 2: Provide peak period alternative mode to help minimize future vehicular congestion

Objective 3: Serve regional trips, as well as trips between and within major activity centers

Objective 4: Maintain or improve travel times within existing and planned activity centers

Goal 3- Provide a Seamless and Cost Effective Commuter Rail Option

Objective 1: Utilize existing land and railroad right-of-way

Objective 2: Utilize available as well as new funding sources

Objective 3: Minimize capital and operating costs

Objective 4: Plan integrated corridors

Goal 4- Promote Sustainability through the Implementation of Commuter Rail

Objective 1: Maintain or improve regional air quality

Objective 2: Develop transportation projects that help focus developments near activity centers

Objective 3: Provide a dependable long-term transportation solution in critical corridors

Goal 5-Increase Public/Private Cooperation to Implement Commuter Rail

Objective 1: Foster public/private partnerships

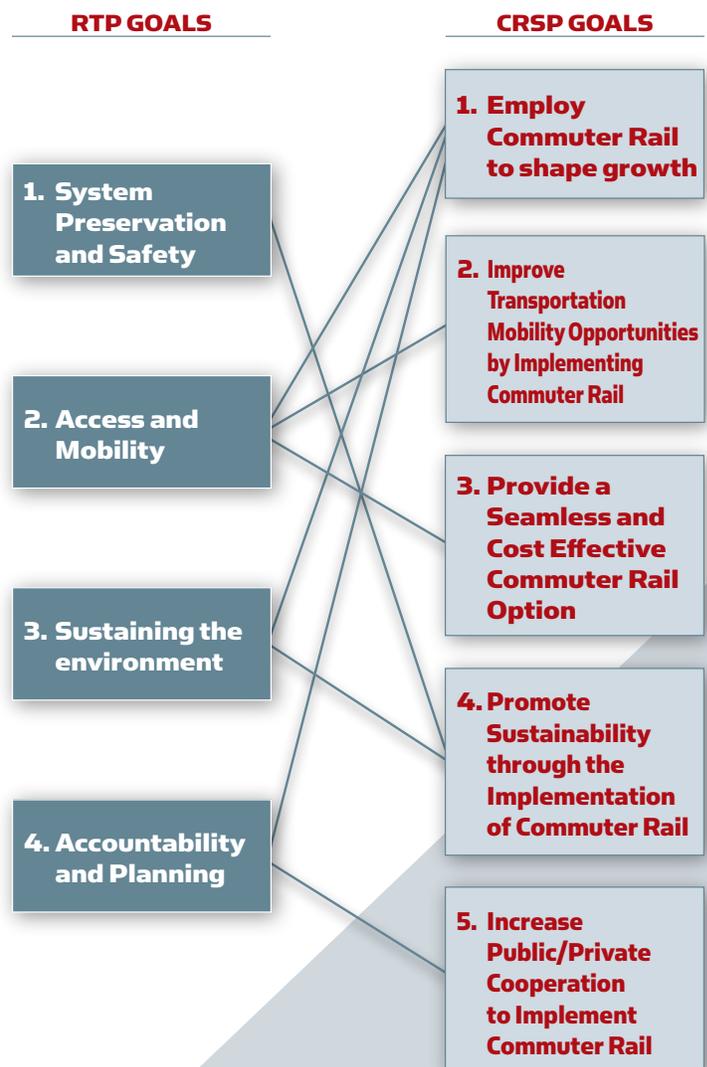
Objective 2: Educate and inform the public

Objective 3: Provide public and private sector funding options

Objective 4: Develop local and regional support for commuter rail

The Commuter Rail Strategic Plan (CRSP) goals were compared to the MAG Regional Transportation Plan to assess consistency. Figure 5 illustrates the comparison and identifies the relationships between the two sets of goals.

FIGURE 5: COMPARISON OF RTP AND CRSP GOALS



COMMUTER RAIL SYSTEM PLAN CONCEPT

The System Plan Concept is oriented around the five freight rail lines that are currently in place in the study area. The system plan is based on the recommendations from the High Capacity Transit Study, (MAG, 2003) and the alignments that were subsequently incorporated into the 2030 RTP vision plan for commuter rail. These corridors are:

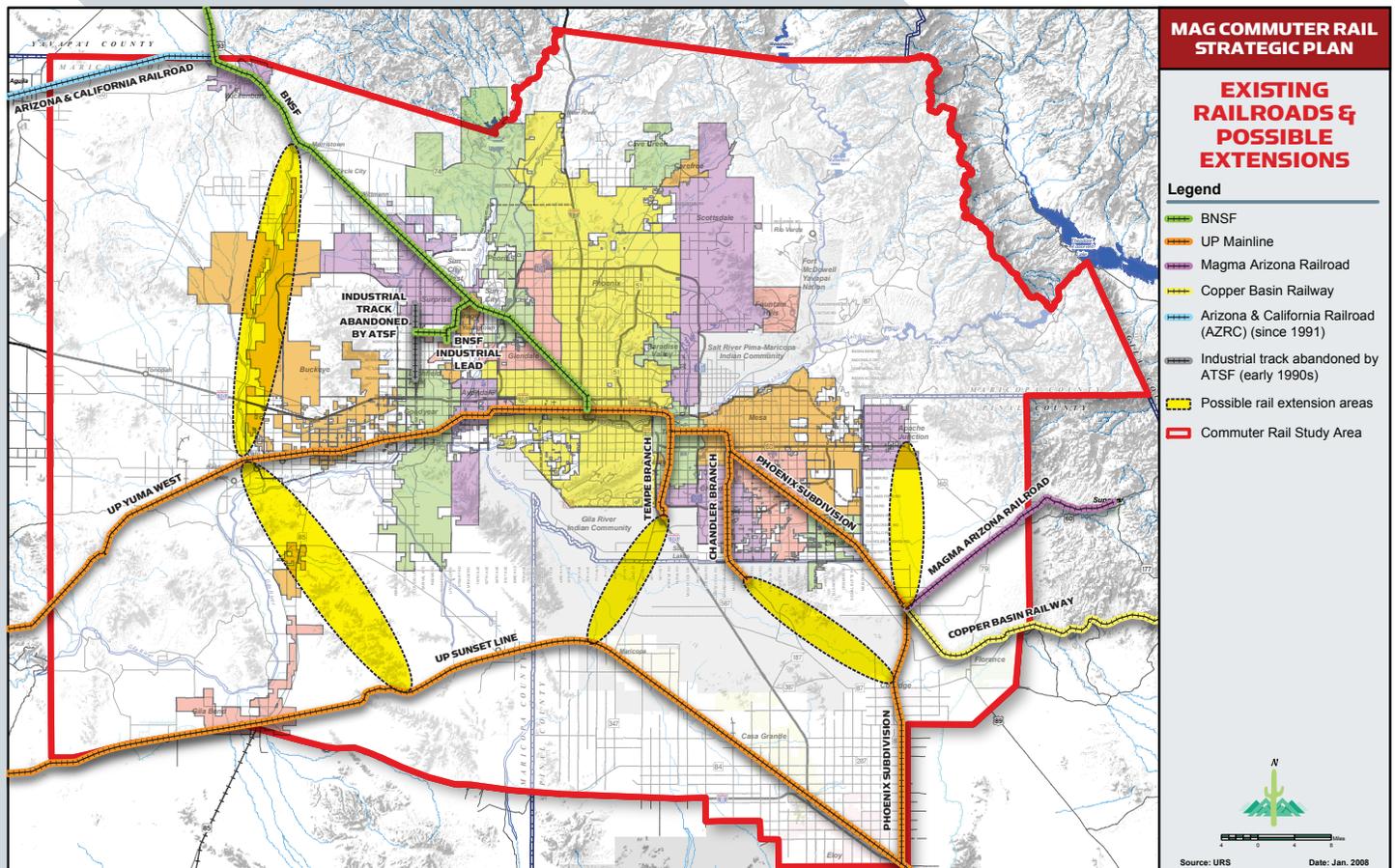
- ➔ BNSF-Grand Avenue
- ➔ UP Mainline-Southeast
- ➔ UP Mainline-Chandler Branch
- ➔ UP Mainline-Tempe Industrial Lead
- ➔ UP Mainline-Yuma/West
- ➔ Possible Extensions/ northern Pinal County

COMMUTER RAIL IMPLEMENTATION SCENARIOS

Three commuter rail implementation scenarios were developed using examples from other commuter rail systems in the United States. The scenarios range from Get Started in a single corridor, to a Starter System in more than one corridor, to a full Regional System with multiple rail lines in operation.

Get Started Scenario

The Get Started scenario would focus on implementing commuter rail in a single congested corridor. The single corridor would provide a local commuter-oriented service and would have several benefits including: less complex coordination with freight railroad companies, potential low cost of entry, and a more simple approach to governance, administration, and funding. Examples of systems with a single corridor include the NorthStar Commuter Rail in Minneapolis and the Trinity Railway Express connecting Dallas to Fort Worth.



Starter System Scenario

The Starter System would include multiple corridors and could focus on more than one congested corridor and possibly serve outlying Maricopa County and Pinal County. The Starter System scenario benefits would include: relatively low cost of entry and the possibility to upgrade the system over time. Examples of Starter Systems include Salt Lake City Commuter Rail and the Virginia Railway Express commuter rail service that connects the Northern Virginia area with Washington, DC.

Regional System Scenario

The Regional System scenario would focus on implementing commuter rail in multiple corridors simultaneously and could therefore serve more of the region. This scenario would provide the region with several social and environmental benefits including improving transportation mobility, promoting sustainability, and helping to shape regional growth. However due to a complex system with multiple corridors extending throughout the region, this scenario would probably require separate facilities from freight rail, would be more costly, and would be the most complex of the three scenarios in regards to governance, administration, and funding. Examples of Regional Systems include the Metrolink commuter rail in Los Angeles, California and the Denver FasTracks transit expansion program.

SCENARIO	DAILY RIDERSHIP CAPACITY	POTENTIAL ANNUAL VMT SERVED (MILLION PER YEAR)	CONCEPTUAL CAPITAL COST
GET STARTED	10,100	60-65	\$50M - 400M
STARTER SYSTEM	20,200	125-130	\$400M - 800M
REGIONAL SYSTEM	141,000	800-900	\$800M to \$2B

IMPLEMENTATION REQUIREMENTS

To successfully implement and operate a commuter rail system, jurisdictions in the region must address three requirements with a comprehensive approach:

- **Coordination with Freight Railroad Companies –** The primary alignments for the commuter rail system would follow existing railroad lines. Development of a strong working relationship with the railroad companies will be critical to successful implementation. It is important to clearly understand the business needs of the private-sector railroad companies to develop agreements to use tracks or to build new ones in the rail right-of-way.
- **Governance and Administration Options –** An acceptable plan to govern and administer the commuter rail system will be necessary among the existing regional transportation planning and funding agencies. Current responsibilities must be respected and an acceptable process must be developed to make decisions relative to the commuter rail system. Numerous models from other urban areas can serve as examples.
- **Funding Options –** Current funding sources are mostly committed to existing transportation programs and projects. Additional sources of funding will be needed to support a commuter rail system. Funding programs for other urban areas can serve as examples for the region.

COMMUTER RAIL SYSTEM IMPLEMENTATION REQUIREMENTS

A coordinated effort by jurisdictions in the region will be needed to implement commuter rail services. Working closely together, jurisdictions will need to carefully develop approaches to partnering with the freight railroad companies, establishing a sustainable funding source and defining a governance and administration mechanism.

Using the goals, objectives and action items identified by the CRSG, the following twelve steps were defined to implement the Commuter Rail Strategic Plan.

STEPS FOR IMPLEMENTATION OF COMMUTER RAIL

ITEM	RESPONSIBLE PARTY	PARTNERS	TIME FRAME
<p>1) ON-GOING COORDINATION</p> <ul style="list-style-type: none"> • Coordination with freight railroads for improved facilities and freight movement. • Coordination with ADOT for intercity passenger service between Phoenix and Tucson. • On-going stakeholder involvement as projects are developed. 	MAG CAAG ADOT	BNSF UP METRO RPTA Local Jurisdictions	On-going
<p>2) UNION PACIFIC PASSENGER RAIL COORDINATION & PLANNING</p> <ul style="list-style-type: none"> • Continue coordination between ADOT and Union Pacific regarding opportunities for passenger rail service in Arizona. • Develop corridor specific recommendations for intercity passenger rail service between Phoenix and Tucson and provide necessary details for implementation. • After ADOT selects a preferred route for Phoenix/Tucson passenger rail service, identify opportunities for additional regional commuter rail service along Union Pacific corridors in Maricopa County and northern Pinal County. 	ADOT	MAG CAAG PAG METRO RPTA Local Jurisdictions	2008-2009
<p>3) BURLINGTON NORTHERN/SANTA FE RAILWAY PASSENGER RAIL COORDINATION & PLANNING</p> <ul style="list-style-type: none"> • Continue coordination between ADOT and BNSF Railway regarding opportunities for passenger rail service in Arizona. • Develop corridor specific recommendations for the BNSF/Grand Avenue Corridor and provide necessary details for implementation. 	MAG	BNSF ADOT METRO RPTA Local Jurisdictions	2008-2009
<p>4) REGIONAL TRANSIT PLANNING</p> <ul style="list-style-type: none"> • Develop corridor specific recommendations and provide necessary details for implementation. (e.g., MAG Transit Framework Plan, Pinal County Transit Feasibility Review, High Speed Rail Strategic Plan). 	MAG ADOT Pinal County	Local Jurisdictions RPTA METRO	2008-2009
<p>5) FUTURE CORRIDOR DEVELOPMENT PLANS</p> <ul style="list-style-type: none"> • Applicable to the following corridors: UP Sunset Corridor, UP Phoenix Subdivision Chandler Branch, Tempe Industrial Lead, UP-Yuma/West, Copper Basin Railway, Magma Arizona Railroad, and possible extensions. • Pending recommendations from current planning studies (e.g., ADOT High Speed Passenger Rail Strategic Plan, METRO Tempe South Alternatives Analysis, etc.), develop corridor specific recommendations and provide necessary details for implementation. 	MAG CAAG	BNSF UP ADOT METRO RPTA Copper Basin Railway Magma Arizona Railroad	2009-2012
<p>6) IDENTIFY FUNDING SOURCE COMMITMENT</p> <ul style="list-style-type: none"> • Define new revenue streams that would be dedicated to development and ongoing operation of the commuter rail system. An assured funding commitment will be required to negotiate for trackage rights or right-of-way from the railroads. At the same time it is important to recognize the strong preference to avoid disrupting current programmed projects and funding among the agencies. 	MAG CAAG ADOT Legislature	Local Jurisdictions	2008-2010

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ITEM	RESPONSIBLE PARTY	PARTNERS	TIME FRAME
<p>7) DEVELOP GOVERNANCE PLAN</p> <ul style="list-style-type: none"> The number of agencies involved in developing a governance plan may be determined by the geographic area for the proposed service. Agencies within the defined service area should work together to plan and implement a regional commuter rail system. The agencies would maintain their current responsibilities and funding for their current programs but would be jointly charged with implementation of commuter rail in the region. The transportation agencies should agree to implement and administer the commuter rail system by one of a variety of means including: <ul style="list-style-type: none"> A new Passenger Rail Authority (PRA); Designation of one of the agencies as the Passenger Rail Authority; or Establishment of a new Joint Powers Authority (JPA) with a provision for representation appropriate to the corridor or system to be implemented. One potential example of a regional Joint Powers Authority would be through the formation of a multi-county Megapolitan Planning Council. 	MAG CAAG ADOT RPTA METRO	Local Jurisdictions	2009-2011
<p>8) DEVELOP PARTNERSHIPS WITH RAILROADS</p> <ul style="list-style-type: none"> Develop a public/ private Memorandum of Understanding followed by detailed agreements with freight railroad companies to define funding and to implement commuter rail facilities and services that will mutually benefit the public and private sector interests. 	Passenger Rail Authority or Joint Powers Authority	BNSF UP Rail Authority Elected officials Tribal Communities	2009-2011
<p>9) PASS ENABLING LEGISLATION</p> <ul style="list-style-type: none"> Work to pass enabling legislation relative to liability and indemnification to facilitate commuter rail operations in freight rail corridors similar to legislation recently passed in Minnesota, Virginia, New Mexico, and Colorado. 	Passenger Rail Authority or Joint Powers Authority	RPTA METRO ADOT	2010-2011
<p>10) DEVELOP SEAMLESS TRANSIT SYSTEM</p> <ul style="list-style-type: none"> Coordinate joint planning and operations to develop a seamless system of transit services throughout the Maricopa/northern Pinal region. 	Passenger Rail Authority or Joint Powers Authority	RPTA METRO ADOT Existing Transit Providers County Governments Tribal Communities Railroads Major Landowners Business Community	2010-2015

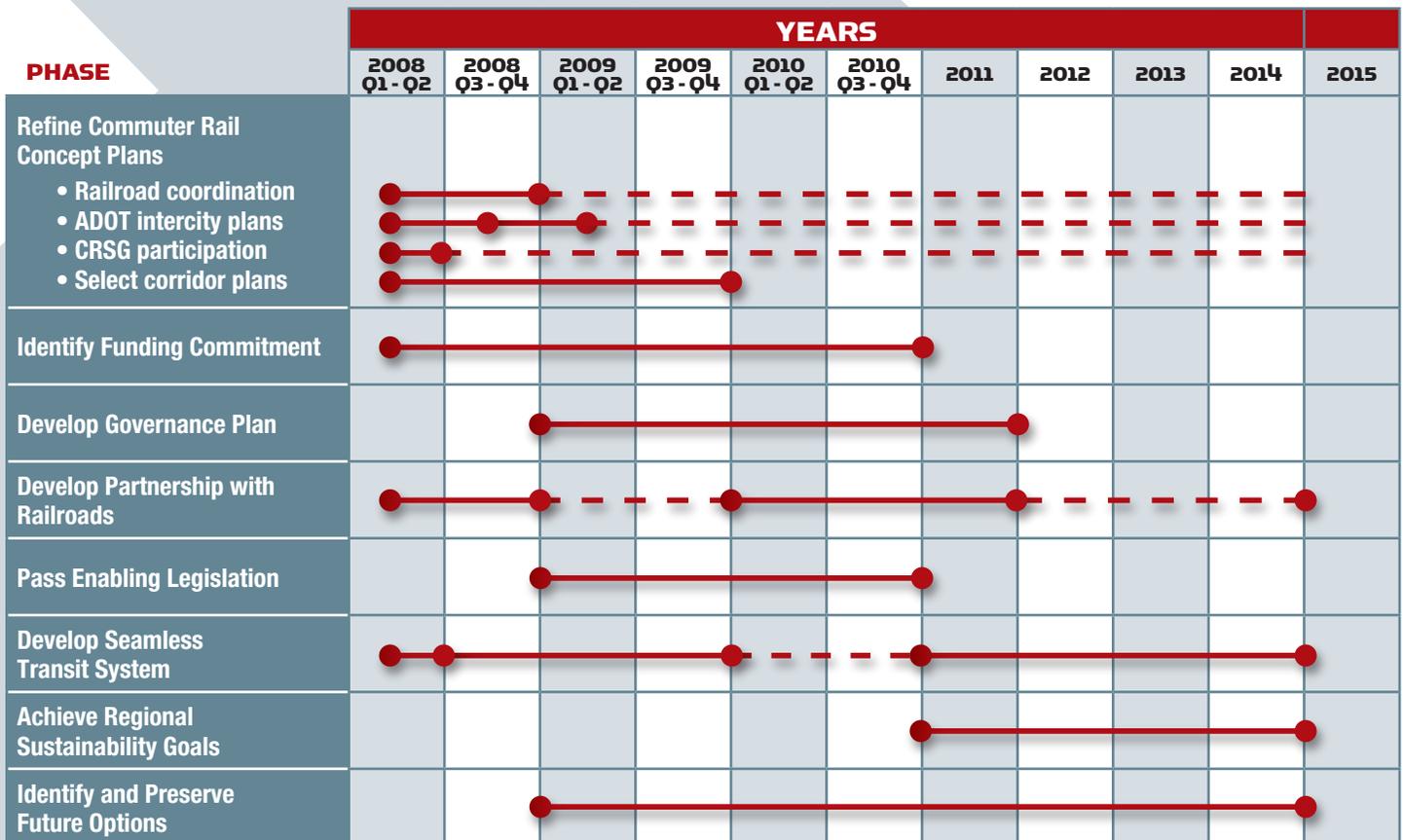
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ITEM	RESPONSIBLE PARTY	PARTNERS	TIME FRAME
11) ACHIEVE REGIONAL SUSTAINABILITY GOALS <ul style="list-style-type: none"> Develop the commuter rail system to reinforce and achieve regional sustainability goals and plans relative to energy and the environment. This will include attention to environmental requirements, land use plans and opportunities, and joint project development. 	Passenger Rail Authority or Joint Powers Authority	MAG CAAG ADOT Railroad Maricopa County Pinal County Local Jurisdictions	2010-2015
12) IDENTIFY AND PRESERVE FUTURE OPTIONS <ul style="list-style-type: none"> Use planning studies to identify and preserve rights-of-way in developing and underdeveloped areas for multimodal transportation corridors to include roadway and rail transit. 	Passenger Rail Authority or Joint Powers Authority	MAG CAAG ADOT Railroad Maricopa County Pinal County Local Jurisdictions	2010-2015

Source: URS, 2008

IMPLEMENTATION STEPS - SCHEDULE



* Note: Based on similar projects in peer cities, the time from funding approval to completion of construction & operation can be within 3 to 4 years. If a permit intends to use Section 5309 New Starts funding, an additional 1 to 3 years may be required for planning work.

— ACTIVE EFFORT - - - MONITORING EFFORTS

