

# GRAND AVENUE



## COMMUTER RAIL CORRIDOR DEVELOPMENT PLAN

DRAFT TECHNICAL MEMORANDUM #1 • FEBRUARY 2009

**MARICOPA ASSOCIATION OF GOVERNMENTS  
GRAND AVENUE COMMUTER RAIL CORRIDOR  
DEVELOPMENT PLAN**

**DRAFT TECHNICAL MEMORANDUM #1  
SUMMARY OF RELEVANT PLANS AND STUDIES,  
PLANNING FRAMEWORK AND DRAFT PURPOSE AND  
NEED**

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**February 5, 2008**

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## 1.0 INTRODUCTION

This document serves as the Maricopa Association of Governments (MAG) Grand Avenue Corridor Development Plan Technical Memorandum #1. The purpose of this document is to provide a framework of information that will be used to develop the final Grand Avenue Commuter Rail Corridor Development Plan. The document will first provide information regarding relevant transportation studies and plans and summarize their relevance to the Grand Avenue corridor. Following the review of transportation studies and plans is a review of General Plans produced by those municipalities that are located along the Grand Avenue corridor. Any information available in these municipal plans that specifically references the Grand Avenue corridor will also be summarized in this section. The final section of this document is the draft version of the project statement of purpose and need, and project goals.

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## **2.0 RELEVANT TRANSPORTATION STUDIES AND PLANS**

This section summarizes transportation studies and plans that have taken place throughout the Greater Phoenix Area that are relevant to the Grand Avenue corridor. In addition to a summary of the plan, any specific applicability to the corridor will be discussed as well. The studies and plans are presented and examined in reverse chronological order, beginning with ongoing studies.

### **2.1 Regional Transit Framework Study (MAG – Ongoing)**

The MAG Regional Transit Framework Study is a study designed to establish a technical framework to guide transit investments and decisions within the MAG region to 2030 and beyond. This study involves a comprehensive evaluation of transit services in the MAG region and several peer regions. The information collected from each region included population, density, funding initiatives, ridership, operating expenses, and planned transit service. Based on the information collected, a list of deficiencies in the MAG region was identified which led to the development of several transit mobility scenarios to address those deficiencies.

To date, the study has identified three transit mobility scenarios that seek to address the regional deficiencies contingent on varying levels of regional funding. The first scenario, Basic Mobility, is a low-cost plan that focuses on a small number of transit routes and facilities. The second scenario, Enhanced Mobility, is an intermediate plan that focuses on enhancing or developing new service in high demand corridors to provide faster regional connections. The third scenario, Transit Choice, is the highest-cost option that includes even more transit service enhancements or the development of new transit service that would create a more comprehensive transit system.

Grand Avenue has been identified for improvements in all three transit mobility scenarios. The first scenario identifies improved bus service levels on the Grand Avenue Limited route between Bell Road and downtown Phoenix. The second scenario includes service level enhancements on the regional bus connector route, the Wickenburg Connector, and peak-period high capacity transit on Grand Avenue between SR-303L and downtown Phoenix. The third scenario includes service level enhancements to the Wickenburg Connector and peak-period high capacity transit, on Grand Avenue between Morristown Road to downtown Phoenix. These scenarios are still in development and may be modified based on travel forecasting. The final report is anticipated to be complete by Spring 2009.

### **2.2 I-10 West Alternatives Analysis (METRO – Ongoing)**

The I-10 West Alternatives Analysis (AA) / Environmental Impact Statement (EIS) is an ongoing project that is examining high capacity transit options in west Phoenix. The study area is approximately 36 square miles and is bounded by SR-101L to the west,

Thomas Road to the north, 7<sup>th</sup> Street to the east, and Buckeye Road to the south. The study is currently analyzing potential light rail transit (LRT) and bus rapid transit (BRT) options along the I-10 Corridor, which extends from the Central Phoenix / East Valley Light Rail Starter Line, along the I-10 freeway, to approximately 83<sup>rd</sup> Avenue. The purpose and need evaluation and Tier 1 Evaluation is complete and METRO is currently in the process of completing the Tier 2 Evaluation, which would identify a locally preferred alternative by Summer 2009.

The BRT Alternatives would include a part “A” and part “B” service. The part “A” service would provide direct service from west Phoenix to the State Capitol and then Central Station. The part “B” service would provide direct service from west Phoenix to Central Station (via 5<sup>th</sup>/3<sup>rd</sup> Avenue HOV ramps) then to the State Capitol. To date, the following alignments are being considered for part “A” service:

- I-10 to I-17 to Washington/Jefferson Streets
- I-10 to 19<sup>th</sup> Avenue to Washington/Jefferson Streets

The LRT Alternatives add more complexity to determining a preferred alignment due to the connectivity requirements of the I-10 West extension to the Central Phoenix / East Valley Light Rail Starter Line. A series of north-south and east-west alignments would be combined to form an alternative. The following north-south alignments are being considered:

- Interstate 17
- 19<sup>th</sup> Avenue

The following east-west alignments are being considered:

- Monroe Street
- Adams Street
- Washington Street
- Jefferson Street
- Jackson Street

### **2.3 GO Glendale Transportation Program (City of Glendale – Ongoing)**

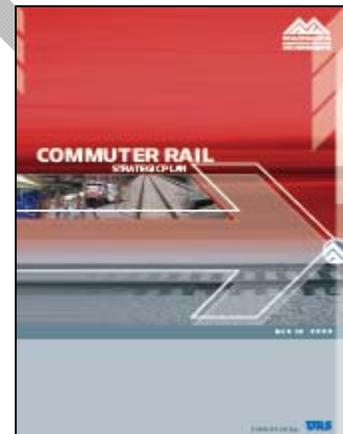
The Glendale On Board (GO) Transportation Program is a 25-year financially balanced program designed to implement transportation improvements throughout the City of Glendale. The program is funded through a half-cent transportation sales tax that was passed by voters in 2001, and since then major progress has been made. Since passage, 27 streets, 7 bicycle/pedestrian, 2 transit, and 4 airport projects have been successfully completed. GO Projects include the recently completed Glendale Park-and-Ride, several downtown improvements, intersection improvements, lighting programs and expanded bus service. To date, all projects that were initially committed

to voters in 2001 have either been completed or are scheduled for completion within the next 25 years.

A joint study between the City of Glendale and ADOT will look to determine design concept plans for improvements along the Grand Avenue corridor between 71<sup>st</sup> and 43<sup>rd</sup> Avenues. Projects to improve traffic flow, reduce accidents, and enhance aesthetics will be scheduled for completion in 2010 with regional and GO funds. The Design Concept Report (DCR) and supporting environmental documentation was completed in fall of 2008.

## **2.4 Commuter Rail Strategic Plan (MAG – 2008)**

The MAG Commuter Rail Strategic Plan provides a framework of how commuter rail could be implemented in the MAG region and northern Pinal County. The study area is separated into five “subareas” that focus on and around existing rail lines. Breaking down the study area provided smaller geographic sections to help focus stakeholder involvement into specific locations. The plan states that the study area is experiencing substantial population growth. A large amount of the employment growth is occurring in the Central Business District (CBD) of Phoenix, resulting in the need for commuters to reach the CBD from outlying communities. The current available roadway capacity cannot serve the future demand without substantial improvements.



The Plan examines how commuter rail can serve these growing outlying communities through operating on existing freight railroad lines and future extensions. Several key agencies contributed to the development of the Plan, including MAG, the Commuter Rail Stakeholders Group (CRSG), and representatives from the Arizona Department of Transportation (ADOT), Metro Light Rail Inc. (METRO), and the Regional Public Transportation Authority (RPTA).

Due to the increased development beyond the urban core in the Greater Phoenix Area, the Strategic Plan identifies Grand Avenue as a major highway corridor that experiences heavy peak hour traffic. The location of BNSF tracks along this corridor potentially provides the existing infrastructure necessary to study future commuter service. The plan develops potential steps for implementation and characteristics of a future commuter line through the Grand Avenue corridor. Such characteristics examined include potential ridership, capital and operating costs, and future travel conditions. The Strategic Plan suggests that implementing commuter rail in this corridor would require joint operation with the BNSF mainline which is a single line corridor and currently operates near capacity. Major improvements to add the additional required tracks are necessary and may potentially involve the acquisition of additional railroad right-of-way. The plan states that there is the possibility that BNSF could move their mainline

operations out of Central Phoenix, currently located at 19<sup>th</sup> Avenue south of I-10, potentially providing operating facilities for future commuter service.

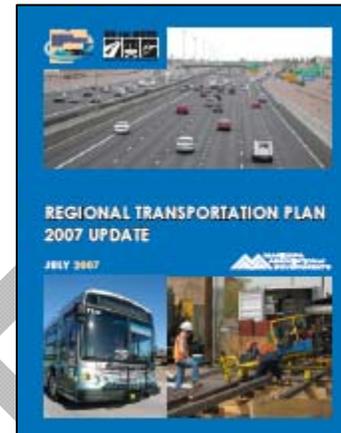
The Strategic Plan also included a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) where stakeholders in each subarea were asked in a facilitated discussion to describe the major issues facing each geographic sector of the region. The Northwest area discussions included the following key issues related to the potential for implementing commuter rail service along the corridor:

- Strengths:
  - Existing rail corridor in place
  - Signal pre-emption and grade separations are in place in many areas
  - Corridor ties communities together and serves transit-dependent population
  - Serves CBD
  - Rail segments are in areas underserved by bus system
- Weaknesses:
  - Rail line may be at or near capacity (may require double-tracking)
  - Increased crossing conflicts and congestion at crossings
  - Increased noise to adjacent residents
  - No funding sources identified
  - Undetermined potential for ridership
  - Infrastructure costs may be high
  - Regional bus system is inadequate to serve rail stations
- Opportunities:
  - Potential to move railroad yards to improve their operations as well as facilitate commuter rail service
  - Potential to transfer to LRT service downtown
  - Economic development potential – including new employment - along corridor as new stations are built
  - Reverse commute potential to non-CBD employment centers
  - Linkage of educational institutions
  - Reduced congestion and improved air quality
  - Increased potential for other modes, including bicycles and pedestrians
- Threats:
  - Political buy-in, legislation needed
  - Support from railroads
  - Funding competition both locally and nationally
  - Public perception that density creates crime and blight
  - Expands growth area boundaries
  - Public perception of major investment that no one will use

## **2.5 Regional Transportation Plan (MAG – 2007)**

The MAG Regional Transportation Plan (RTP) 2007 Update identifies funded transportation improvements to the year 2028 in Maricopa County. The current RTP was adopted in 2007 and includes the 2003 comprehensive amendment and all subsequent annual updates. The funding source for the RTP comes from Proposition 400, a voter-approved half cent sales tax that divides monies between

freeway/highway, arterial street, and transit projects. The document is organized in three sections, including: Planning Process (Section 1), Transportation Modes (Section 2); and Systems Operations and Management (Section 3). The first section provides an overview of the planning process with the approach to developing the plan, a description of goals and objectives, a review of existing conditions in the region, and the role of government agencies and the public in developing the plan. The second section provides an overview of the transportation modes including a financial plan, planned capital and transportation improvements, and funding programs that address special needs. The third section identifies various measures that are in place to improve the performance of the transportation system.



The RTP identifies a variety of improvements throughout the Grand Avenue corridor. The Freeways and Highways chapter of the RTP identifies the addition of a general purpose lane and grade separations between SR-303L and McDowell Road. The Public Transit chapter of the RTP identifies Grand Avenue as an eligible high capacity transit corridor. The Glendale light rail extension is identified to be in operation by fiscal year 2017 with an end-of-line light rail station around Glendale Avenue and Grand Avenue. In addition, the Grand Avenue Limited bus route is identified to enhance service from one-way to two-way peak hour service in operation in fiscal year 2013 and would provide service from approximately Greenway Road to downtown Phoenix via Grand Avenue. In conjunction with the implementation of the Grand Avenue Limited service a park-and-ride facility located at approximately Glendale Avenue and Grand Avenue would be in operation during the same fiscal year to serve the route.

## **2.6 Freeway Express Bus/BRT Operating Plan (RPTA – 2007)**

The RPTA Freeway Express Bus/BRT Operating Plan was an eleven-month study that was completed in October 2007. The plan presents findings and recommendations for implementing 24 new express bus routes in the MAG region that are identified in the MAG RTP 2007 Update and funded through Proposition 400. The recommendations include improved optimization for several express bus routes in terms of route structuring and scheduling to improve the overall effectiveness of the regional transit system.

The plan does not identify any express bus routes that directly serve the Grand Avenue corridor; however, there are several express routes that provide service to existing and

planned park-and-ride facilities that are located near Grand Avenue. The Surprise-Scottsdale Express began operation in July 2007 and currently provides service between the Surprise Park-and-Ride (Bullard & Tierra Buena Ln) and Scottsdale Airpark. The Peoria Express is identified to begin operation in July 2013 and would provide service between the planned Peoria Park-and-Ride (91<sup>st</sup> Avenue & Peoria Avenue) and downtown Phoenix. The Loop 303 Express is identified to begin operation in July 2022 and would provide service between Arrowhead Town Center and downtown Phoenix via SR-303L with an express bus stop at a planned park-and-ride location identified at Greenway Avenue and Bullard Avenue.

## **2.7 Interstate 10-Hassayampa Valley Roadway Framework Study (MAG – 2007)**

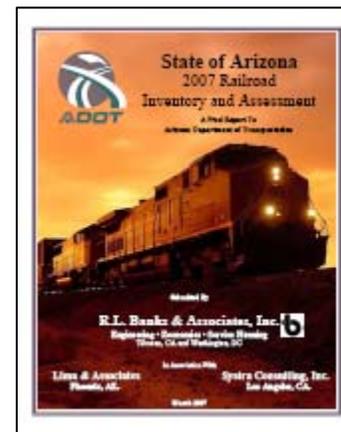
The MAG Interstate 10-Hassayampa Valley Roadway Framework Study is one of multiple studies initiated by MAG to create a transportation network to accommodate future growth in the area in the next 30-50 years. The purpose of the study is to identify key north-south and east-west roads that would provide access throughout the study area and preserve Interstate 10 as a primary travel corridor for passenger and freight traffic. In addition, the study also identifies major intersections in the study area, opportunities for alternative transportation modes, available funding options, and the identification of future corridors so right-of-way could be preserved.

The study identifies Grand Avenue to be upgraded from a four-lane principal arterial roadway to an eight-lane freeway.

## **2.8 State of Arizona 2007 Railroad Inventory and Assessment (ADOT – 2007)**

The State of Arizona 2007 Railroad Inventory and Assessment was completed in March 2007. The purpose of the railroad assessment was to inventory and assess the changes since the last railroad inventory which was conducted in 2000. The inventory included an assessment of the following in regards to freight and passenger rail services:

- Service levels
- Track conditions
- Operations and current operating characteristics
- Ownership
- Intrastate and interstate rail connections
- Safety information
- Current and planned rail facilities, programs and projects

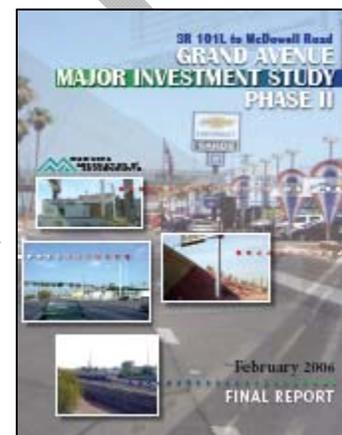


The inventory identifies the various facilities that utilize the BNSF Phoenix Subdivision. There is a major intermodal facility located in Glendale, a trans-load facility for automobiles in El Mirage, and a primary switching facility called Mobest Yard near

downtown Phoenix which was recently refurbished to accommodate heavier trains. Mobest Yard contains a fueling facility, turntable, repair shop and crew terminal. The inventory identified that the City of Surprise is currently working with BNSF and private developers to create a new industrial park along the Ennis Subdivision which is adjacent to the Phoenix Subdivision. This development could include new warehouses, distribution centers, and commercial facilities. The inventory also identified that there have been reports that the BNSF is considering relocating its primary operations out of Mobest Yard to land that was acquired in the City of Surprise. The inventory referenced the MAG High Capacity Transit Study (2003) which states that the BNSF has presented the idea of relocating its primary facility northwest of El Mirage. Highway facilities and operations, adjacent land uses and potential commuter rail design and operating requirements along the Grand Avenue corridor were summarized.

## **2.9 US 60/Grand Avenue Major Investment Study Phase II – SR-101L to McDowell Road (ADOT – 2006)**

In 1998, ADOT commissioned the first Grand Avenue Major Investment Study which recommended eight grade separation projects along Grand Avenue, which are now built. The US 60/Grand Avenue Major Investment Study (MIS) Phase II provided prioritized recommendations for additional improvements to the Grand Avenue corridor from SR-101L to McDowell Road. The RTP includes \$147 million for those additional projects. The study considers existing conditions throughout the corridor, population and projected traffic volumes, environmental considerations, issues and needs of the corridor, funding, recommended improvements and an implementation plan. The majority of these recommendations will be administered by ADOT. Currently, Grand Avenue is a four-lane arterial street from SR-101L to approaching 83<sup>rd</sup> Avenue and a six-lane arterial throughout the rest of the study area. The study process determined that a major objective was to address traffic flow along and across Grand Avenue. Recommended improvements include: additional grade separations, intersection improvements, access management, and community mitigation.

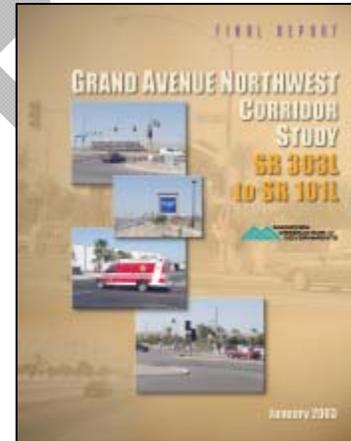


The study identifies six BNSF facilities along Grand Avenue including the Mobest Yard at McDowell Rd/19<sup>th</sup> Ave, the Intermodal Facility at Grand Avenue/Camelback Road, the Santa Fe Center at Grand Avenue between Indian School and Camelback, the Glendale Yards at Grand Avenue/Maryland Avenue, the Glendale Depot at Grand Avenue/Glendale Avenue, and the BNSF Automotive Distribution Center at Grand Avenue/Thompson Ranch Road. According to this study, although commuter rail does not currently exist along Grand Avenue, BNSF has indicated that commuter service could be implemented in addition to the existing freight service if the schedules can be coordinated. Comments received from public meetings state that providing commuter rail service along the BNSF corridor could potentially alleviate traffic congestion. These

sentiments were echoed during Agency Steering Group (ASG) meetings where it was suggested that commuter service would eventually be necessary from Wickenburg to Phoenix. It was also determined during the ASG meetings that all future Grand Avenue improvements should not only accommodate future commuter rail but they should not prevent the service either. In response, the Phase II Study supports an ultimate concept for Grand Avenue where the recommended improvement projects do not preclude the addition of commuter rail facilities within the railroad right-of-way.

## **2.10 Grand Avenue Northwest Project (MAG – 2003)**

The MAG Grand Avenue Northwest Project studies the long-term needs of the highway corridor and determines a plan for meeting those needs. The study area encompasses an 11.5 mile section of Grand Avenue between SR 303L and SR 101L. This study identifies US 60 (Grand Avenue) as one of the primary urban arterials serving the northwest valley and is a vital link to the state's highway system. In addition to assessing conditions of Grand Avenue this report includes consideration for: transit, pedestrians, bicyclists, electric carts, and service for the elderly and physically challenged. It gives a detailed description of the characteristics of the corridor including: existing and future socioeconomic conditions, existing transportation facilities, environmental issues, long range roadway needs and alternative mode needs. The study recommends improvements to the corridor based on evaluation results and public input.



The Grand Avenue Northwest Study identifies several improvements throughout the corridor. Improvements to the highway, transit service, and pedestrian access (including bicycles) are described in detail. This study describes high capacity transit service to draw riders away from their cars, especially during peak travel periods. Transit options considered for the corridor included commuter rail, light rail, additional bus service as well as the construction of park-and-ride facilities. The study of commuter rail service in the BNSF right-of-way has been determined to be a necessity by citizen and agency staff at community forums and at a public open house. The Study also suggests that commuter service along the existing railroad is feasible although there is currently only one track which is heavily used by freight traffic. BNSF is considering the possibility of constructing a new freight rail yard northwest of this study area which would reduce the amount of freight traffic throughout the corridor. By reducing freight traffic the tracks would be more readily available for commuter service. The study determined that high capacity transit improvements, as part of a regional system, are in the mid to long-term timeframe for implementation within the Grand Avenue corridor.

## **2.11 High Capacity Transit Study (MAG – 2003)**

The MAG High Capacity Transit Study was a sixteen month study completed in June 2003 that focuses on identifying high capacity transit corridors which would be

considered in the development of the RTP. The three transit technologies that were evaluated include: commuter rail, light rail, and bus rapid transit. The study assumes a 40-year planning horizon and recommended a total of 16 corridors for short-, middle-, and long-term implementation. Short term implementation would be within the next 15 years. Middle-term implementation would occur within 15-30 years and long-term implementation would occur after 30+ years.

The Study identifies Grand Avenue between SR-303L and downtown Phoenix as a potential commuter rail corridor. Stations were identified near the following locations:

- Grand Avenue/SR-303L
- Grand Avenue/Bell Road
- Grand Avenue/Thunderbird Road
- Grand Avenue/Peoria Avenue
- Grand Avenue/Glendale Avenue
- Grand Avenue/Camelback Road
- Downtown Phoenix

The short-term implementation recommends that negotiations and major investment studies commence within the next 15 years. The middle-term implementation recommended peak period only service. The long-term implementation recommends the maximum amount of commuter rail that the corridor could support. The Study also states that the BNSF has been considering relocating several freight facilities away from downtown Phoenix to areas north of El Mirage. Figure 1 identifies the recommended high capacity transit network as identified in the study.

**Figure 1 Recommended High Capacity Transit Network from the MAG High Capacity Transit Study**



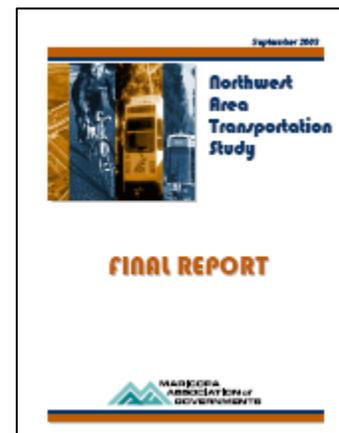
## **2.12 Valley Metro Regional Transit System Study (RPTA – 2003)**

The Valley Metro Regional Transit System Study (RTS) is an element of the RTP produced by MAG, most recently updated in 2007. The RTS establishes an efficient regional multimodal transit plan for the entire county that could be realized over the next 20 years. The RTS study area includes all of Maricopa County and the northern portion of Pinal County. The study focuses on all modes of public transit except high capacity transit or fixed guideway which will be evaluated in the high capacity studies of the RTP. The high capacity studies will include an evaluation of potential light rail, commuter rail, or bus rapid transit service throughout the Greater Phoenix Area. The RTS evaluation will aim to determine how to best meet current and future transportation needs of the Greater Phoenix Area through the analysis of the existing transit networks for bus and dial-a-ride services. The results were used to identify necessary transit projects that could be implemented over the next twenty to thirty years.

The RTS identifies Grand Avenue as a regional expressway with regional significance. The study determined that an Expressway Regional Connector route is viable along the Grand Avenue corridor. The Grand Avenue Limited bus route will operate as a peak period route. It connects directly from remote park-and-ride lots to major activity centers, ultimately serving downtown Phoenix. The Grand Avenue Limited route will serve four proposed transit nodes including: Grand Ave/Jomax Park-and-Ride, Surprise Park-and-Ride, Peoria Transit Center, and Glendale Park-and-Ride/Transit Center. Service began to Glendale in 2005 and is scheduled to the Surprise and the Grand Ave/Jomax Park-and-Rides in 2016 and 2025 respectively.

## **2.13 Northwest Area Transportation Study (MAG – 2003)**

The MAG Northwest Area Transportation Study identifies the transportation needs within the northwest study area and addresses those needs through the development of a prioritized list of necessary transportation projects. The study area focuses on the land north of I-10 and west of I-17 located within Maricopa County. These projects were ranked against themselves and other regional projects to determine where regional funding sources should be allocated. In addition to determining which projects deserve potential regional funding, the study provides general long-range planning efforts to guide transportation development in the northwest valley.



The study identifies Grand Avenue as the major surface roadway in the Northwest Valley. It also recognizes the BNSF tracks along the Grand Avenue corridor as being critical to the railroad operations in the northwest valley. According to the study, broader use of this corridor is being considered for such uses like commuter service. The study also notes that due to the unique location of Grand Avenue, its limitations to adjacent land uses, and its proximity to the railroad should qualify it as more than a roadway

corridor. However, issues such as right-of-way preservation for high capacity transit projects, and funding are hurdles that will have to be addressed as the planning process advances. This study states that should the prospect of commuter service prove viable, communities along the BNSF railroad line will likely be supportive if funding is available. Implementation would depend on the willingness of BNSF to accommodate commuter service on their tracks. Without the cooperation of BNSF, the chances of using the existing corridor for high capacity transit service will be significantly reduced. As of the date of this study, the position of the railroad regarding such possibilities was not yet clear. For specific details on future high capacity transit potential in this corridor, refer to the MAG High Capacity Transit Study dated June 2003.

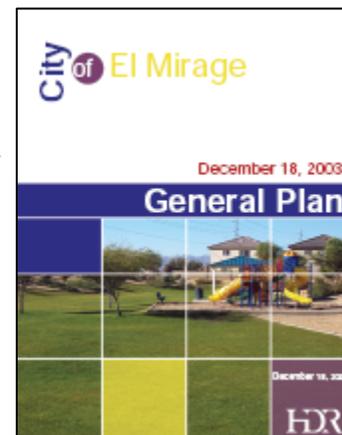
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### 3.0 RELEVANT MUNICIPAL GENERAL PLANS

In an effort to assess the conformity of commuter rail with already existing municipal plans of the communities along the Grand Avenue corridor, the general plans of Phoenix, Glendale, Peoria, Surprise, El Mirage, Youngtown, and Wickenburg along with Maricopa County’s Comprehensive Plan were all assessed, and are listed below in alphabetical order. Municipal general plans guide the land use, circulation, growth, and development of their communities for both the existing and long term. General plans help to establish community visions for the entire region as well as help create an identity for each individual neighborhood. For the purposes of the Grand Avenue Commuter Rail Corridor Development Plan, planned development and land use trends along the Grand Avenue corridor, as well as any references to freight or commuter rail have been identified and summarized.

#### 3.1 City of El Mirage – Adopted December 2003

The purpose of the General Plan for the City of El Mirage is to provide guidance to city decision makers to help them achieve the relationships between land use, transportation, quality of life, the environment, and economic prosperity. The plan will provide a vision for the community as it moves toward the future.



The Plan sees Grand Avenue as an attractive and appealing gateway into the city. The rail corridor is a convenient and efficient commuter connection between El Mirage and downtown Phoenix. Commercial development is located along Grand Avenue from the city boundary at Greenway Road extending south to Thunderbird Road. The commercial land use is backed by medium density residential on the south side of Grand Avenue. Encompassing most of the north side of Grand Avenue is a transit oriented mixed-use designation where a rail-to-truck auto transfer area is currently located adjacent to the BNSF tracks. Most new development is expected to happen either south of Peoria Avenue or north of Grand Avenue. Options do still exist for unique infill development along the Grand Avenue corridor which is largely related to the MAG High Capacity Transit Plan (2003) that identifies a possible commuter rail stop in El Mirage. The area of land north of Thunderbird Road and east of Grand Avenue includes a variety of land uses including residential, mixed-use transit oriented, and regional commercial development.

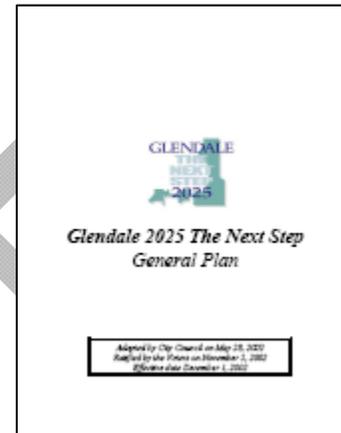
The Circulation Element of the Plan includes goals, objectives, and policies for mobility between El Mirage and its adjacent communities. Grand Avenue’s regional significance makes it an important corridor from a transportation perspective. Although no passenger service currently exists on the BNSF rail line, commuter service is being studied. The

Circulation Element defines coordination between regional agencies as a goal in achieving a long-range transportation plan. These efforts will help to promote a regional gateway concept for the Grand Avenue corridor.

### **3.2 City of Glendale – Adopted May 2002**

The intent of the City of Glendale General Plan is to provide specific focus through the statement of goals, objectives, and policies to guide public and private decisions related to the growth and development of the City of Glendale. The plan provides direction regarding the development of the community as a whole.

The Plan's Land Use Element identifies Glendale as being predominantly residential at 45.1% with characteristics consistent of a bedroom community. However, the Grand Avenue corridor is primarily focused on employment, including office and industrial sites. There is some underutilized industrial land in the triangle between Grand Avenue, Camelback Road, and 59<sup>th</sup> Avenue that could be used for future development. The planned land use for the Grand Avenue corridor is a mix of Heavy Industrial, Light Industrial, Entertainment Mixed-Use, Medium Density Residential (3.5-12.0 du/ac), General Commercial, and some Public Facilities. The majority of the planned land use for this corridor is industrial in nature. In addition to land use designations, the Land Use Element identifies compatibility between land use and transportation, and promoting sound growth management methods as goals of the General Plan. Objectives identified that will help reach these goals include encouraging transit oriented development around transit stations to promote ridership, and cooperating with adjacent jurisdictions to promote compatible land use.



General support for alternative transportation modes can be found in the Circulation Element of the Plan where it states that the “Support of Alternative Modes of Travel and Ensure Regional Connectivity” are goals of the study. The plan also states that Glendale will foster options to automobile travel by seeking to expand the range of service levels of its transit system. The Glendale transportation system will be effectively connected to the regional transportation system by working with adjacent jurisdictions and MAG to ensure synchronized transportation links and supporting the completion of regional facilities. Not only is a diverse transportation system necessary, it is imperative to integrate land use into the development of that system. Mixed-use development, utilizing alternative transportation modes will help to reduce the number of vehicle trips throughout the city. While the Grand Avenue corridor is not specifically identified in the Circulation Element as a possible Commuter Rail Corridor, the presence of the BNSF rail line offers commuter potential for the future to realize the city's transportation goals and objectives.

### **3.3 Maricopa County Comprehensive Plan – Adopted October 1997**

The Maricopa County Comprehensive Plan creates the future vision of the county. The Plan takes into consideration the planning activities over the entire unincorporated county and seeks to create strong vibrant communities within Maricopa County by providing a guide for decision makers concerning growth and development.

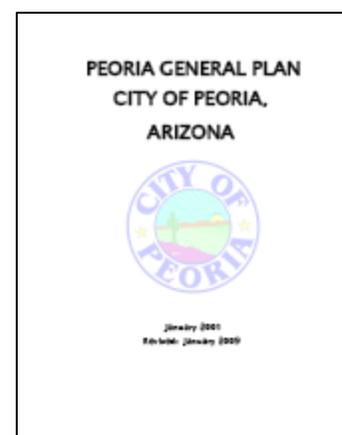


The Maricopa County Comprehensive Plan identifies the section of land outside the City of Surprise as County Area Plans. County Plans include areas, generally located outside a municipal general plan, that are contained in a county area land use plan. Due to the vast area governed by Maricopa County, the land use designations under the Comprehensive Plan determine generalized land use, development or preservation concepts not specific to land use or density. The Grand Avenue Land Use Plan will identify more specific land use possibilities for the portion of the corridor that is unincorporated. As long as areas of the corridor remain unincorporated, they are expected to be developed under rural densities. The County’s previous development pattern was not compatible to alternative transportation modes. New development master plans will strive to reduce the dependency of automobiles by considering and encouraging transit oriented development and alternative modes of transportation to be included in a complete transit system. It is a goal of the Comprehensive Plan to integrate transportation planning and land use.

The Transportation Element of the Maricopa County Comprehensive Plan includes regional coordination toward creating a multimodal transit system. An efficient multimodal system will need to include development patterns that will help advance alternative modes of travel. It is the position of the Plan to encourage transit oriented development and multimodal transit alternatives in an effort to develop a seamless transportation system that serves regional travel needs. As a part of a multimodal system, the county supports further study of the commuter rail service and is willing to be a stakeholder in the process.

### **3.4 City of Peoria – Adopted January 2001**

The purpose of the Peoria General Plan is to provide guidance for future growth and development throughout the city and its planning area. The plan was established through community participation and support and acts to define the community’s values and goals regarding growth and development. It provides a framework for making decisions by describing long-term goals for the City’s future as well as policies to guide day-to-day decisions.



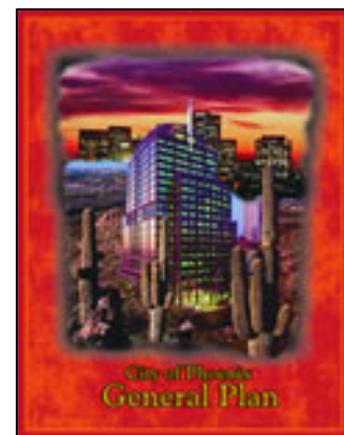
Throughout the Grand Avenue corridor, the land use plan includes areas of heavy business/industrial use along with areas of mixed-use, commercial, and residential designations. Single family homes back the land uses that are located directly on Grand Avenue from Cactus Road to Olive Avenue. The Plan's Land Use Element addresses the relationship that exists between the transportation and land use. Existing major transportation corridors such as Grand Avenue are key elements of the General Plan because of the opportunities they present in the form of connections and continuity throughout the Greater Phoenix Area.

The Circulation Element stresses that the transportation system must integrate multimodal opportunities in an effort to reduce reliance on the automobile. The city must develop an efficient integrated system that can serve both local and regional travel needs. The Circulation Element also identifies transit, light rail, and commuter rail needs as critical elements in the city's circulation system. To achieve the goal of creating a regional multimodal system, the Plan identifies a series of policies and objectives. It will be imperative to continue coordination efforts in transportation, transit, commuter rail, and roadway improvements with ADOT, Maricopa County Department of Transportation (MCDOT), RPTA, and METRO to ensure necessary improvements to the system are made. The City will partner with these agencies in the development of a commuter rail access plan along the BNSF railroad corridor. In addition to planning commuter service, the City intends to provide for the linkage of pedestrian and automobile traffic with future commuter rail systems. To effectively link people to the expanded transportation system, the City will develop park-and-ride facilities in commuter corridors and encourage transit oriented uses around future commuter rail transit stations. Regulations will be established to guide the new developments.

### **3.5 City of Phoenix – Adopted December 2001**

The purpose of the Phoenix General Plan is to provide widespread guidance for the growth and redevelopment of the city. This vision can be achieved through the implementation of specific goals, policies, and recommendations.

The Plan's Land Use Element identifies the Grand Avenue corridor as being located within 3 of the city's 14 urban villages; Maryvale, Alhambra, and Encanto. The corridor has a strong existing industrial presence in all three villages. The south side of Grand Avenue stretching from Camelback Road to 19<sup>th</sup> Avenue is currently all industrial land use and is proposed to remain as such well into the future. The north side of the corridor is currently a mix of uses including single family, commercial, industrial, and vacant land. The proposed future land use for the north side of the corridor identifies the section from Thomas Road to 19<sup>th</sup> Avenue and Camelback Road to Indian School Road as commercial backed by mostly single family homes with some areas showing multi-family and higher density residential designations. The section of

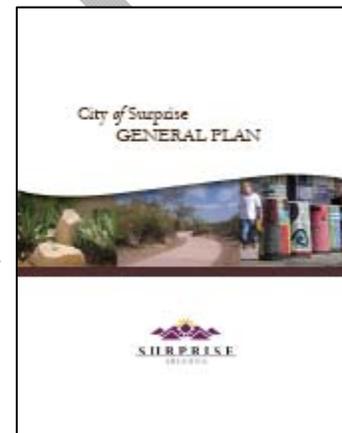


the corridor between Indian School Road and Thomas Road is proposed to remain all industrial. In addition to future and existing land use, the Land Use Element identifies the creation of transit oriented development as a city-wide goal in an effort to promote safe and convenient access to buses and trains to promote ridership.

The Plan's Circulation Element provides support for a multimodal transportation system. The plan states that an effective multimodal system should allow for movement of goods and all people safely and efficiently throughout the city, especially into, and between, the urban village cores. The city recognizes the importance of developing an integrated, comprehensive, multimodal transportation plan for the state. The plan also supports an inter-metropolitan rail system that could provide the citizens of Phoenix with the choice of accessible railroad passenger service.

### **3.6 City of Surprise – Adopted July 2008**

The City of Surprise General Plan contains goals and general policy statements for the physical development of the City. It is an expression of the community vision for the future and acts as a guide for decision-making on both public and private development.



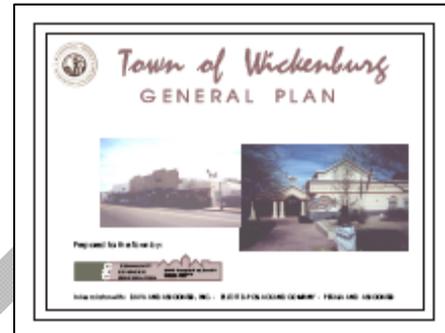
The City of Surprise land use designations throughout the Grand Avenue corridor include mostly rural and low density residential. There are also small areas of commercial land use throughout the corridor. The Surprise Community Development Department identifies the intersection of Grand Avenue and 211<sup>th</sup> Avenue as the heart of a future “Uptown Surprise.” According to the Plan, the centralized location of Uptown Surprise creates an opportunity for a concentration of employment with a full complement of urban amenities and services. This location is identified as a prime candidate for a major rail station and interchange with Grand Avenue, and is recommended in the Plan to be designed to include transit oriented development.

The Plan calls for providing alternative modes of transportation to enhance the current circulation system. Strategies identified to achieve this system include: maintaining an integrated land use and transportation planning process, providing adequate transportation corridors through right-of-way preservation during the planning process and continually coordinating and cooperating with regional planning agencies and adjacent communities to ensure continuity between alternative modes of travel. However, the most significant strategy expressed in achieving this system with respect to Grand Avenue is the mandate to work with all appropriate agencies to support the future implementation of commuter rail service in the BNSF railway corridor. The Circulation Systems Element of the Plan acts as a guide for planning a sufficient multimodal transportation network to include a full range of transit options. It is recommended in the Plan that this transportation system should connect to a region-wide network that includes commuter rail. This is because there is a high demand for

rail services to and from Surprise, and the BNSF line is planned to be of utmost importance in achieving this objective.

### **3.7 Town of Wickenburg – Adopted August 2003**

The purpose of the Town of Wickenburg General Plan is to express the preferences of the citizens for the development of their community. The plan is a blueprint for maintaining and improving the quality of life throughout the Town, and it assesses the opportunities and constraints of the surrounding geographical area.



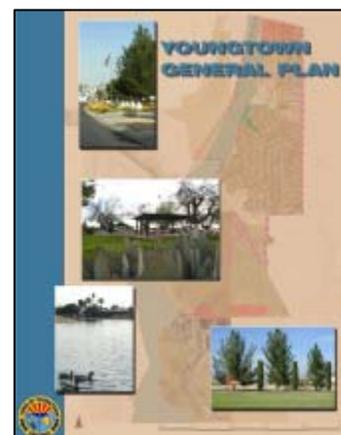
The Plan's Land Use Element states that 27 percent of the Town is developed, and an additional 3,300 acres are available for future development. Approximately 35 percent of the town's land is not suitable for development due to significant constraints such as steep terrain and natural drainage channels. There is not much opportunity for connections to the BNSF tracks south of Wickenburg because they are separated from the Grand Avenue corridor by the Hassayampa River Preserve. There are some single family rural land use designations south of the tracks as it enters into Wickenburg. Grand Avenue borders the north side of the Hassayampa River and there are some commercial and single family land use designations along the corridor, but those uses are minimal. More intense concentrations of commercial and mixed-use occur near downtown Wickenburg along Grand Avenue and the rail corridor.

The Transportation Element considers multimodal transportation options as transit alternatives. The Plan encourages the consideration of the BNSF corridor for regional public transit. The Plan identifies that commuter service could improve accessibility to the town from downtown Phoenix and offer an excellent transportation alternative. Planning for such service would help realize the Plan's goal of providing alternative modes of transportation to explore a regional transit connection.

### **3.8 Town of Youngtown – Adopted November 2003**

The purpose of the Youngtown General Plan is to provide guidance for Town staff and citizens in achieving the community vision for future land use and development. The plan determines the goals, objectives, and policies necessary to make decisions about the future of the community.

The Land Use Element of the Plan identifies approximately 52 percent of the planning area to be vacant developable land. However, the only portion of Youngtown that includes the Grand Avenue corridor is from the Agua Fria River to



111<sup>th</sup> Avenue which is less than one-half mile. The land use designation for this portion of Grand Avenue is commercial. There is a school located at the intersection of Grand Avenue and 113<sup>th</sup> Avenue. An opportunity exists to combine scattered commercial uses located on Grand Avenue, enabling the development of 113<sup>th</sup> Avenue into a gateway for the community.

The Circulation and Transportation Element considers Grand Avenue as a road of regional significance. The Plan identifies the need to continue participating in the Grand Avenue Northwest Corridor Study (2003) as well as continuing to promote regional cooperation on transportation issues. This section also encourages the use of alternative transportation modes and states that the community is supportive of using the BNSF tracks for commuter rail. In addition to supporting commuter rail technology, the plan identifies a need to require new development to support new transit opportunities.

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## **4.0 STATEMENT OF PROJECT PURPOSE AND NEED**

This section presents the goals and statement of purpose and need for the Grand Avenue Corridor Commuter Rail Development Plan. This section will first provide a background and description of the project, including a summary of previous studies and plans, as well as a summary of existing highway and railroad facilities and operations. This will be followed with a detailed explanation of the project goals, and the statement of purpose and need.

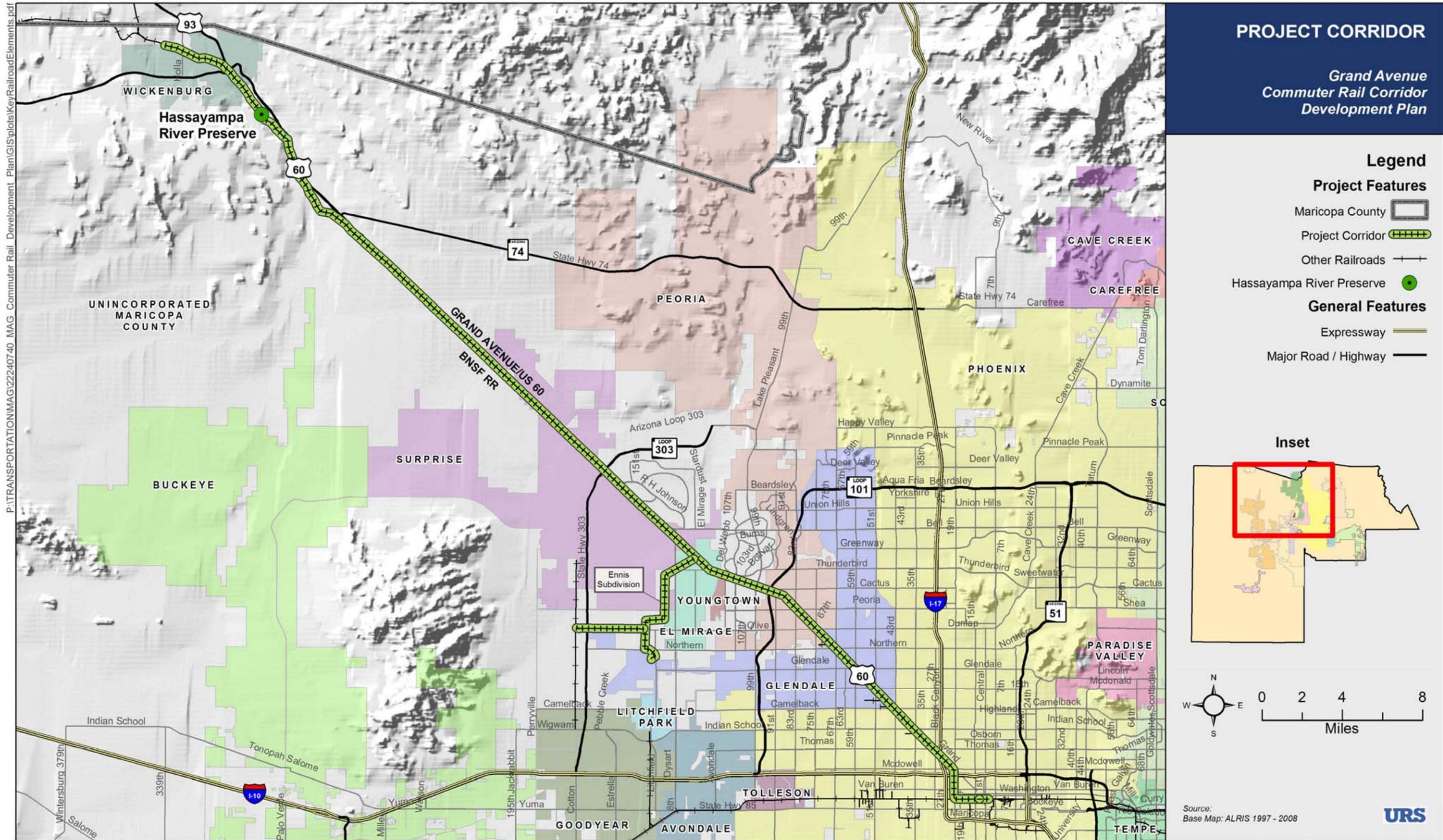
### **4.1 Project Background and Description**

MAG is conducting this study to analyze the potential for, and feasibility of, implementing a commuter rail service along the BNSF railway from Wickenburg continuing southwest along Grand Avenue to the Union Pacific Depot in downtown Phoenix. The corridor extends from downtown Phoenix through the cities of Glendale, Peoria, Surprise, Youngtown, El Mirage, Wickenburg, as well as through areas of unincorporated Maricopa County. Figure 2 depicts the location of the BNSF railway as well as the location of the cities located in the corridor.

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Figure 2 Project Corridor



## 4.2 Previous Commuter Rail Studies and Plans

Increases in population, employment, and traffic congestion in Maricopa County have resulted in the development of transportation studies and plans aimed at addressing the growth in the region. In 2003 MAG completed the High Capacity Transit Study; that study presented a recommended transit network designed to meet the travel demand needs of the region with a projected forecast year of 2040. In this study, the Grand Avenue corridor was identified as a proposed commuter rail corridor, and recommendations of operating requirements to implement a commuter rail system were made.

To further the study of commuter rail, MAG allocated \$5 million for the creation of multiple commuter rail development plans. In 2008, MAG completed the Commuter Rail Strategic Plan which outlined the steps by which the implementation of commuter rail service in the Maricopa County and northern Pinal County region should follow. Among the recommendations made from that study was that corridor development plans for each potential commuter rail corridor should be produced. The Grand Avenue Commuter Rail Corridor Development Plan (2008) is a result of that recommendation.

## 4.3 Grand Avenue/US 60 Facilities and Operations

The Grand Avenue corridor is a major arterial that is primarily a six lane divided highway with a raised center median and 10-12 foot lanes from the SR-101L to McDowell Road. From Wickenburg to the SR-101L, the highway has primarily four general use lanes. One of the defining characteristics of Grand Avenue is the fact that it is a diagonal roadway that crosses through the one-mile grid system that makes up the general road network in the Greater Phoenix Area. The diagonal nature of the highway provides a direct connection from the northwest valley into downtown Phoenix.



Intersection located at Grand Avenue and 163<sup>rd</sup> Avenue

As a result of running parallel to the railway and the diagonal nature of Grand Avenue, there are multiple complex six-legged intersections that have caused safety concerns in the corridor. A number of grade separations have been constructed or are currently being planned to reduce these complexities and to provide for safer intersections.



Picture showing proximity of BNSF railway to Grand Avenue

Grade separations have been constructed at the following intersections:

- Grand Avenue over 27<sup>th</sup> Avenue/Thomas Road
- Indian School Road over 35<sup>th</sup> Avenue/Grand Avenue
- Grand Avenue over 43<sup>rd</sup> Avenue/Camelback Road
- 51<sup>st</sup> Avenue over Bethany Home Road/Grand Avenue
- Maryland Avenue over 55<sup>th</sup> Avenue/Grand Avenue
- Grand Avenue under 59<sup>th</sup> Avenue/ Glendale Avenue
- 67<sup>th</sup> Avenue over Northern Avenue/Grand Avenue
- Olive Avenue over 75<sup>th</sup> Avenue/Grand Avenue

As part of the ADOT Final Design Concept Reports (DCR) for improvements in the corridor from the SR-101L to 19<sup>th</sup> Avenue, crash data was gathered for the time period of August 1, 2001 to July 31, 2006. The data identified the number, and rate of crashes for intersections located in this section of the corridor. The findings of the data are located in Table 1.

**Table 1 Grand Avenue (SR-101L to McDowell Rd) Crash Rates**

Intersection	Total Crashes	Average Entering ADT	Crash Rate
91 <sup>st</sup> Avenue	130	N/A	N/A
85 <sup>th</sup> Avenue	41	N/A	N/A
Peoria Avenue	59	43,647	0.74
83 <sup>rd</sup> Avenue	39	36,102	0.59
75 <sup>th</sup> Avenue/Olive Avenue	146	45,004	1.78
67 <sup>th</sup> Avenue/Northern Avenue	125	61,010	1.12
Myrtle Avenue	17	42,050	0.22
57 <sup>th</sup> Drive	6	N/A	N/A
51 <sup>st</sup> Avenue/Bethany Home Road	175	73,380	1.31
35 <sup>th</sup> Avenue	74	64,400	0.63
33 <sup>rd</sup> Avenue	44	29,470	0.82
Osborn Road/31 <sup>st</sup> Avenue	82	33,150	1.36
Encanto Boulevard/23 <sup>rd</sup> Avenue	10	27,000	0.20
McDowell Road/ 19 <sup>th</sup> Avenue	69	57,575	0.66
<b>Total</b>	<b>1,071</b>		

Source: ADOT 2008b, ADOT 2008c, ADOT 2008d

The average crash rate in the City of Phoenix from 1996 to 1998 for two intersecting major arterials was 1.47 crashes per million entering vehicles. The findings of the reports gathered for the DCR's identified only one intersection in the corridor between the SR-101L and McDowell Road that exceeded the City of Phoenix average. However,

of the fourteen intersections where crashes were recorded, the four intersections with crash rates of over 1.0 were all six-legged intersections.

The following list details current transportation deficiencies along the Grand Avenue corridor that have been identified as part of this document:

- High levels of congestion during peak travel periods
- Numerous at grade crossings of railroad tracks combined with diagonal intersections
- Safety concerns as a result of complex six-legged intersections
- Low levels of service

#### **4.4 Railroad Facilities and Operations**

The BNSF line from Wickenburg to the Union Depot in downtown Phoenix was built from 1893 to 1895 and is part of what is known as the 209-mile BNSF Phoenix Subdivision. The entire stretch from the Union Pacific Depot to Wickenburg is primarily single track and unsignalled with sidings located periodically to allow trains to pass each other as needed. Maximum freight speed along the Phoenix Subdivision is 49 mph. Total number of daily trains traveling through the Phoenix Subdivision is twenty, ten in each direction. Implementation of commuter rail service would likely require a change of track conditions to a signalized, double track with increased speed for passenger trains.



BNSF Rail at Grand Avenue and 19<sup>th</sup> Avenue looking north

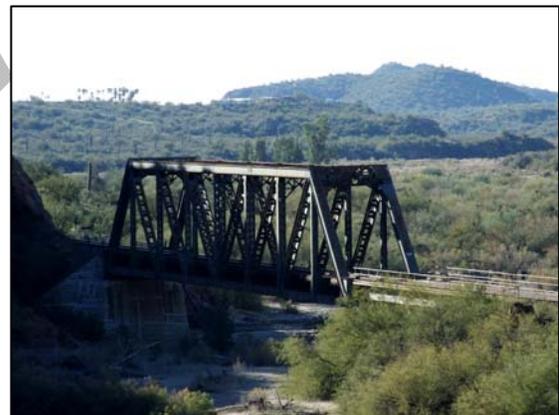
As a result of the rail line running parallel with Grand Avenue there are many at-grade crossings. The diagonal nature of Grand Avenue and the railroad has created multiple complex six-legged intersections that also include at-grade track crossings. As mentioned previously, many highway grade separations have been built to alleviate the complexities of these intersections. However, there are still some locations where complex, at-grade crossings exist. These crossings will cause difficulty if commuter rail were to be implemented along the corridor. This is due to a result of an increase in train traffic and more stringent Federal Railroad Administration (FRA) requirement for passenger trains.

Major BNSF rail facilities in the corridor that will have an impact on the potential implementation of commuter rail include:

- Mobest Yard located near the intersection of McDowell Road and Grand Avenue in Phoenix serves as the primary yard for BNSF along the Phoenix Subdivision. The yard was built in 1895 and is 3,000 feet long. BNSF has indicated that it may have interest in shifting activity from this yard to a new location in the City of Surprise.
- The BNSF Intermodal Facility is located near the intersection of Camelback Road and Grand Avenue. This location is used to transfer freight between trains and trucks.
- The Glendale Depot is located near the intersection of Grand Avenue and Glendale Avenue and operates as BNSF office space.
- The BNSF Automobile Distribution Center is located near the intersection of Thompson Ranch Road and Grand Avenue. This location is used for the distribution of incoming automobiles from freight trains to the Greater Phoenix Area.

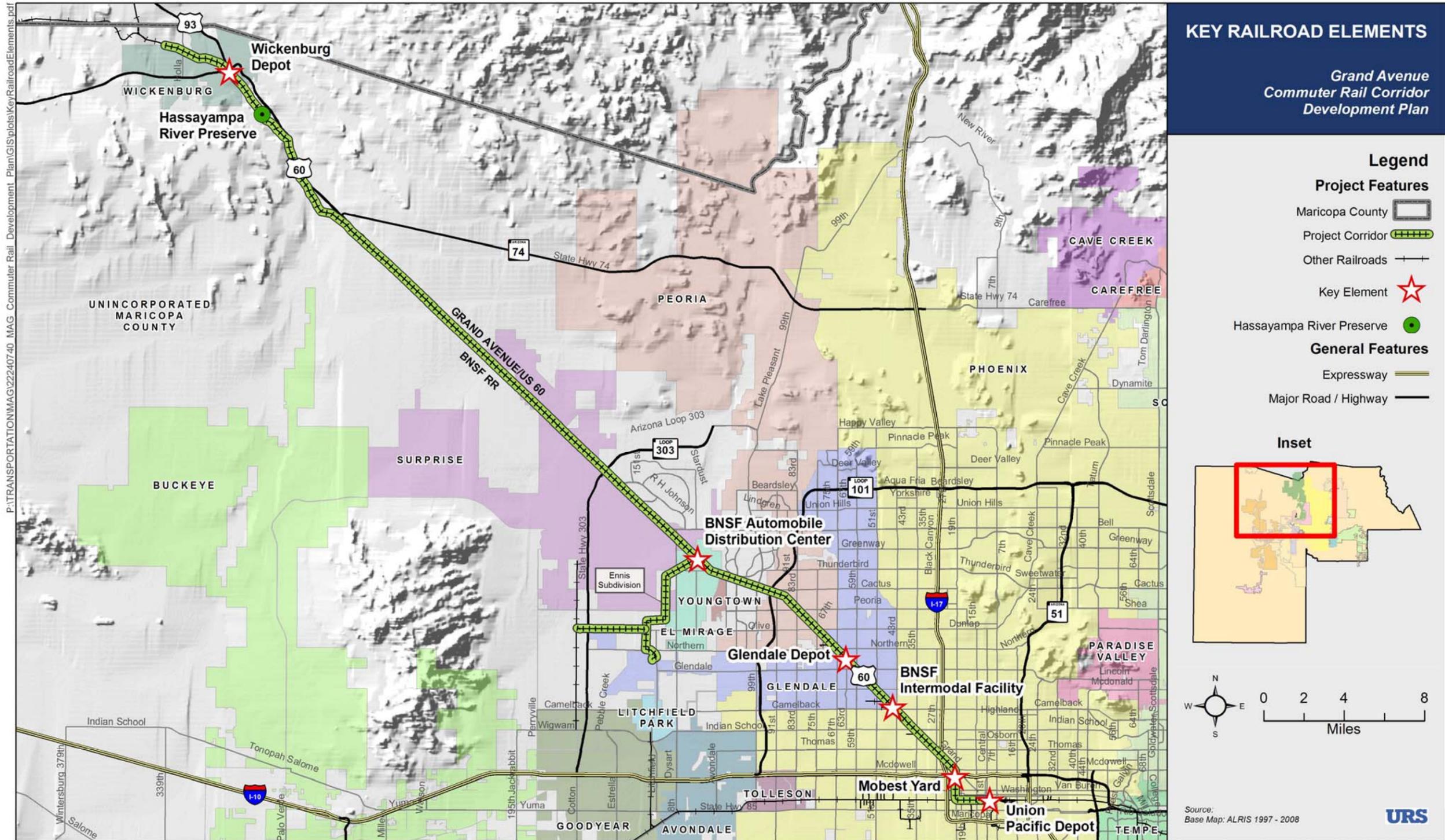
On January 8, 2009, a field tour was conducted of the BNSF Grand Avenue corridor from Wickenburg to Phoenix. The entire tour was conducted from public property as there was not, at that time, permission to access BNSF property. The tour included an inventory of as many crossings, bridges, and other features as possible. Issues and potential problems that were identified from the inventory include the following:

- The depot at Wickenburg is currently being used by the Chamber of Commerce. The depot site has very limited space for parking.
- The approximately 10 miles of railway within the Hassayampa River Preserve could not be accessed due to restrictions caused by private property and limited access. This area will likely be an issue if double tracking is necessary due to the Preserve and the topography along the railroad.
- There are many culverts along the corridor (approximately 3 per mile) that will have to be considered for locations where double track may be required.



Bridge located in the Hassayampa River Preserve

Figure 3 Key Railroad Elements



#### 4.5 Future Land Use Along Grand Avenue

Each municipality that the project corridor travels through identifies in their local comprehensive plans future land uses that they feel best utilizes the Grand Avenue corridor. In addition to identifying future land uses, every municipality has identified a general vision for the future transportation network in their respective community. Table 2 identifies the land uses expected by the municipalities along the project corridor, as well as identifies whether or not commuter rail in the corridor is supported or identified as part of their general plan.

**Table 2 Summary of Future Land Uses**

Municipality	General Plan Year	Future Land Uses Identified	Commuter Rail Identified
El Mirage	2003	Commercial, Residential, Transit Oriented Mixed Use	Yes
Glendale	2002	Commercial, Residential, Industrial, Entertainment, Public Facilities, Mixed Use	No
Maricopa County	1997	Rural	Yes
Peoria	2001	Commercial, Residential, Industrial, Mixed Use	Yes
Phoenix	2001	Commercial, Residential, Industrial	Yes
Surprise	2008	Commercial, Residential, Mixed Use	Yes
Wickenburg	2003	Commercial, Residential, Mixed Use, River Preserve	Yes
Youngtown	2003	Commercial	Yes

Source: City of Phoenix 2001, City of Glendale 2002, Peoria 2001, City of Surprise 2008, City of El Mirage 2003, Town of Youngtown 2003, Town of Wickenburg 2003

The proposed land uses along the corridor include commercial, residential, industrial, mixed use, and others. Every municipality with the exception of Glendale has noted commuter rail as a desirable transportation alternative and showed a willingness to participate in any discussions involving the development of commuter rail service along the BNSF railway.

#### 4.6 Project Purpose

As a result of the data collected for the project so far, the proposed purposes of the Grand Avenue Commuter Rail Corridor Development Plan are to:

- Improve mobility between and among major activity centers in the corridor for all population groups
- Provide high-speed, high-capacity multimodal solutions that help mitigate congestion and improve air quality
- Provide a high-quality transportation system that functions seamlessly with other planned transportation improvements in the region

- Provide a high-quality transportation system that facilitates and encourages economic development and redevelopment in the corridor

#### **4.7 Project Needs**

Needs that have been identified within the project corridor, based on data collected so far, include the following:

- There is a need to address the increase in population and employment growth that is resulting in increased travel demand and intra-corridor trips.
- There is a need to supplement the existing and committed roadway improvements since they will not keep pace with travel demand.
- There is need for a high-capacity, high-speed travel corridor connecting the population and employment centers in the corridor with downtown Phoenix.
- There is a need to slow the growth of vehicle miles traveled in the corridor to improve air quality.

##### **4.7.1 Population and employment growth that is resulting in increased travel demand and intra-corridor trips**

Currently those living in the northwest portion of the Greater Phoenix Area have limited opportunities for direct travel into downtown Phoenix. The only direct route providing this travel path is Grand Avenue. As a result of the expected increase in population and employment in the adjacent cities, the existing roadways are expected to become more congested, thus adding additional travel time into downtown Phoenix along the Grand Avenue corridor. Table 3 summarizes projected population and employment growth along the corridor.

The project corridor passes through portions of unincorporated Maricopa County and seven incorporated cities: Phoenix, Glendale, Peoria, Surprise, El Mirage, Youngtown, and Wickenburg. According to projections from MAG, these municipalities located along the corridor will experience a combined average increase in population of 60.7 percent from 2005-2030. The municipalities expected to experience the most significant population growth during this time are Surprise, with a 330.0 percent increase, and Peoria, with a 116.4 percent increase.

MAG projections also show that the same seven municipalities located along the corridor are expected to experience a combined increase in total employment by 78.0 percent from 2005-2030. This is 17.3 percent more than the expected population growth for the same period of time. The two municipalities that will experience the largest percentage increase in total employment are Surprise, with an 806.8 percent increase, and El Mirage with a 303.4 percent increase.

**Table 3 Population and Employment Growth by Municipal Planning Area**

Municipality	2005	2030	Change 2005-2030	Percent Change
<b>Population</b>				
Phoenix	1,510,177	2,201,843	691,666	45.8
Glendale	257,891	322,062	64,171	24.8
Peoria	141,441	306,070	164,629	116.4
Surprise	93,356	401,458	308,102	330.0
El Mirage	31,935	38,717	6,782	21.2
Youngtown	6,011	7,359	1,348	22.4
Wickenburg	9,606	17,732	8,126	84.6
<b>Total</b>	<b>2,050,417</b>	<b>3,295,241</b>	<b>1,244,824</b>	<b>60.7</b>
<b>Employment</b>				
Phoenix	811,513	1,246,527	435,014	53.6
Glendale	88,172	171,498	83,326	94.5
Peoria	34,631	117,861	83,230	240.3
Surprise	16,289	147,703	131,414	806.8
El Mirage	2,858	11,528	8,670	303.4
Youngtown	1,657	2,042	385	23.2
Wickenburg	5,055	12,316	7,261	143.6
<b>Total</b>	<b>960,175</b>	<b>1,709,475</b>	<b>749,300</b>	<b>78.0</b>

Source: MAG 2007b

This increase in both population and employment growth will result in a growing number of trips which will create a significant strain on existing and committed roadway improvements planned in the corridor.

**4.7.2 Supplement the existing and committed roadway improvements since they will not keep pace with travel demand**

As a result of existing population and employment, the Grand Avenue corridor currently experiences high levels of congestion. This congestion occurs despite ongoing roadway improvements. Current traffic volumes for the corridor produced by MAG identify a range of 16,000 to 30,000 automobiles traveling in Grand Avenue on the average weekday in 2007 from the SR-101L to 19<sup>th</sup> Avenue. Data collected for the area from the SR-101L to the SR-303L show weekday traffic volumes ranging from 17,000 to 41,000. The segment of the corridor from Wickenburg to the SR-303L has an average weekday traffic volume of 12,000. Traffic volume projections gathered from the MAG 2030 Base Model as part of the Jomax Road Corridor Improvement Study for the year 2030 projected a range of 42,000 to 64,000 automobiles traveling on the average weekday in 2030 from the SR-101L to 19<sup>th</sup> Avenue. The same data projected 2030 traffic volumes from the SR-303L to the SR-101L to range from 34,000 to 67,000, and traffic volumes from Wickenburg to the SR-303L to range from 20,000 to 61,000. (MAG 2007e)

In an effort to address the current and expected congestion in the corridor, MAG has identified multiple roadway improvements for Grand Avenue from the SR-303L to McDowell Road in the MAG 2007 RTP Update. These improvements are identified in Table 4.

**Table 4 Future Roadway Improvements US 60**

Phase	Improvement	Extent	Date
Phase I: 2006-2010	Widen Grand Avenue to three lanes in each direction,	99 <sup>th</sup> to 83 <sup>rd</sup> Avenues	2010
Phase I: 2006-2010 (Additional improvements under study to be constructed in Phase II)	Widen Grand Avenue to three lanes in each direction.	Loop 303 to 99 <sup>th</sup> Avenue	2011
Phase I: 2006-2010	Right turn lanes, Sidewalks, Landscaping,	Loop 101 to McDowell Road	DCR Completed October 2008
Phase II, IV: 2006-2010	Unspecified improvements to be identified after future studies	Loop 101 to Van Buren Street	TBD

Source: ADOT 2008a

In addition to the improvements identified in Table 4, the following intersections have been identified as locations for future grade-separations: (MAG 2006a)

- Northern Parkway directional ramps over 67<sup>th</sup> Avenue/Grand Avenue.
- Bethany Home Road under Grand Avenue/51<sup>st</sup> Avenue
- Grand Avenue under Indian School Road/35<sup>th</sup> Avenue
- 19<sup>th</sup> Avenue over Grand Avenue/McDowell Road

Despite the planned improvements for the corridor, continuous growth in travel demand will result in continued congestion. Level of service (LOS) is a quality measure that describes operational conditions within traffic flow, including intersections. Levels of service are divided into six categories ranging from LOS A, representing the best possible operating conditions, to LOS F representing the worst. According to the MAG RTP, in 2006 twelve intersections in the corridor from the SR-303L to 19<sup>th</sup> Avenue were operating at levels of service E-F. In the year 2028, after the implementation of the roadway improvements identified in the RTP, MAG projects that there will be twenty intersections operating at levels of service E-F, eight more than in 2006.

The findings presented by MAG in the RTP show that even with the implementation of planned roadway improvements, congestion along the corridor will continue to increase. These conditions will inhibit the ability of residents in northwest Phoenix metro area from accessing downtown Phoenix in timely manner

Figure 4 Future Roadway Improvements

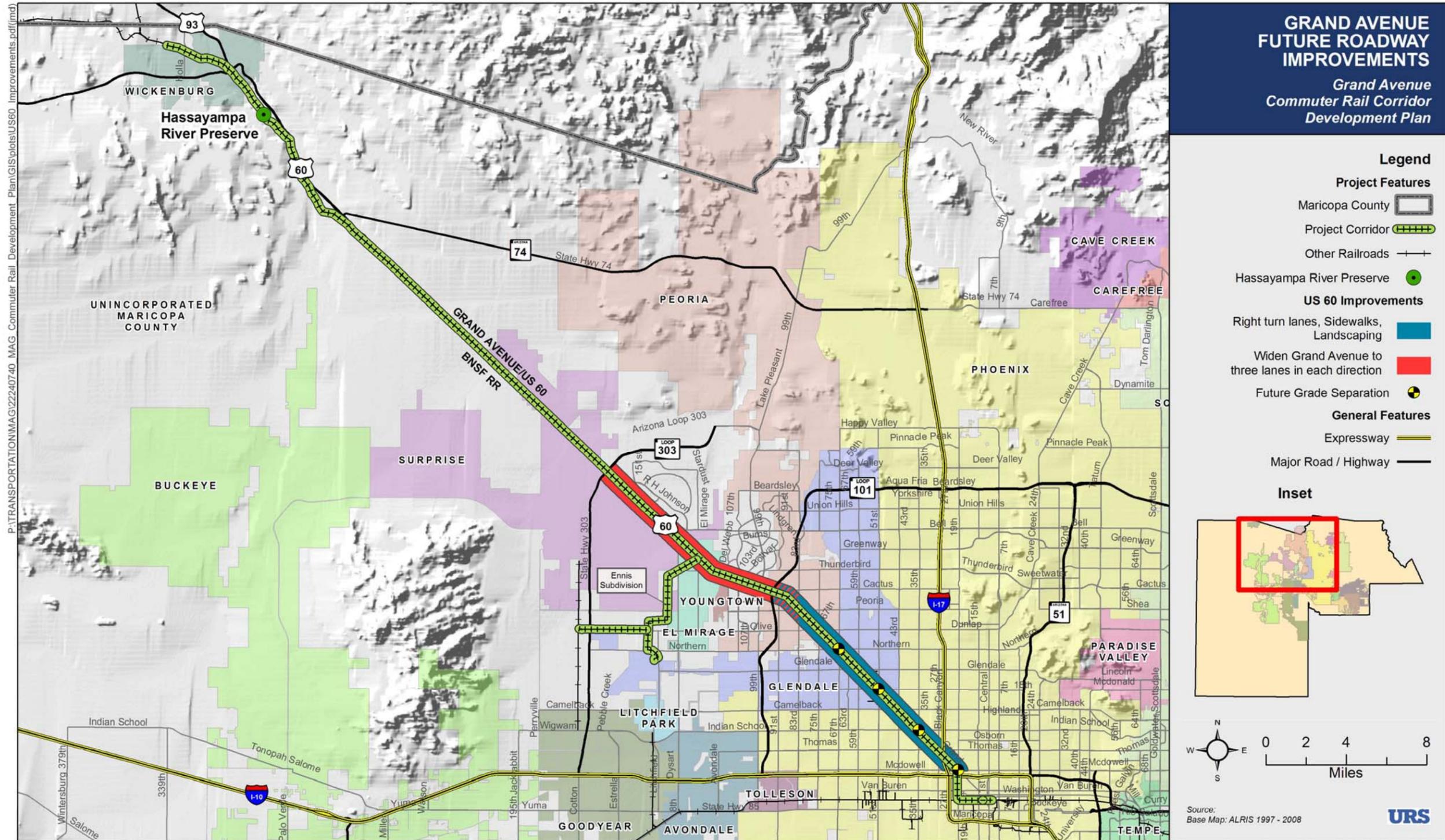
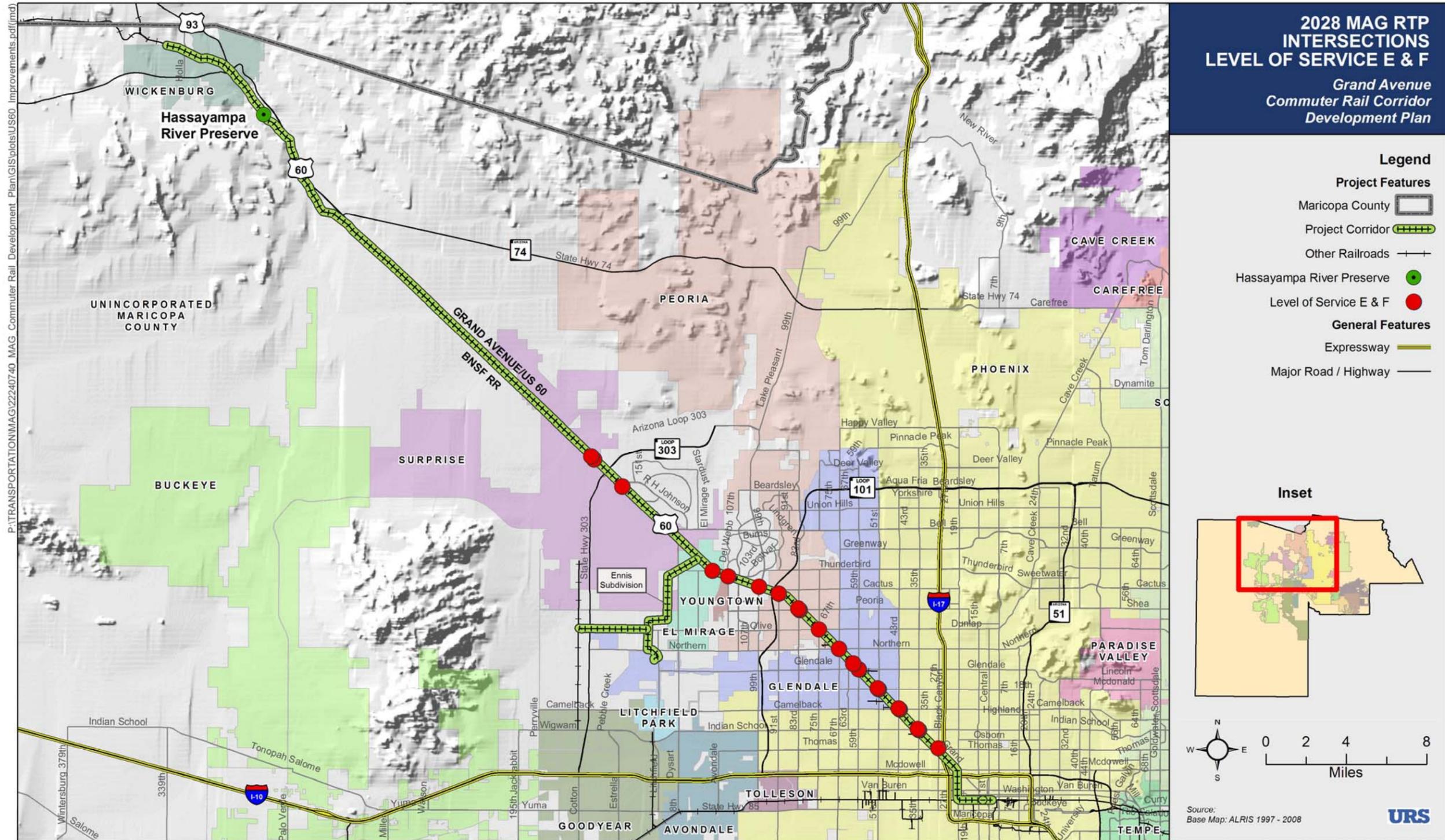


Figure 5 Intersection Levels of Service (2028)



### 4.7.3 Need for a high-capacity, high-speed travel corridor connecting the population and employment centers in the corridor with the Phoenix central business district

The municipalities located along the northern portion of the Grand Avenue corridor such as Surprise and Peoria have limited high-capacity, high-speed connections to downtown Phoenix. The only such existing highway options connecting to downtown Phoenix are by taking the SR-101L south to I-10 or the SR-101L east to I-17. Both of these alternatives do not provide direct access to downtown Phoenix, but rather an indirect, and often time-consuming connection. As stated previously, current and future intersection levels of service in the corridor are not at acceptable levels. A commuter rail service along the Grand Avenue corridor would provide a high-speed, high-capacity service connecting into downtown Phoenix that will not be impeded by congested roadways.

A direct connection is possible because of the diagonal nature of the project corridor, and the existing freight railway located along the corridor that has the potential to provide commuter rail service. Commuter rail has the advantage of being able to avoid the congestion on the roadways, thus providing shorter travel times during peak periods of travel. The MAG High Capacity Transit Study (2003) projected initial 2020 ridership on commuter rail service along the Grand Avenue corridor at 4,900 weekday passengers. This was 2,000 passengers more than any other potential commuter rail corridor identified in the plan.

The MAG Commuter Rail Strategic Plan (2007) created conceptual corridor travel conditions that compared the performance of commuter rail and highway during peak period traffic conditions in the Grand Avenue corridor. In these conditions, a commuter rail system would add the equivalent of 1.5 highway lanes of carrying capacity, and provide a faster travel time, as outlined in Table 5.

**Table 5 Conceptual Corridor Conditions**

Grand Avenue/ US 60 Congestion (Peak Hour/Peak Direction in 2006)				Commuter Rail Operation (Peak Hour/Peak Direction)		
Limits	Auto Volume	Level of Service	Auto Travel Time	Commuter Rail Travel Time	Peak Hour Potential Riders	Highway Lane Equivalent
Phoenix to Loop 303	2,700	LOS F	65 min	45 min	2,000	1.5

Source: MAG 2008a

### 4.7.4 Need to slow the growth of in-vehicle miles traveled in the corridor to improve air quality

According to National Ambient Air Quality Standards portions of the project corridor have been identified as non-attainment areas for two transportation related pollutants. These include carbon monoxide (CO) and particulate matter less than or equal to ten microns in diameter (PM<sub>10</sub>). The 2002 Periodic Emissions Inventory for CO, produced

by the Maricopa County Air Quality Department (MCAQD), identifies the portion of the project corridor south of SR-303L as contained within a CO non-attainment area. The Study also states that on-road mobile sources within the CO non-attainment area produce 322,867 tons of CO per year, compared to 166,308 tons produced by non-road sources. The 2005 Periodic Emissions Inventory for PM<sub>10</sub> produced by MCAQD identifies the entire project corridor as located within a PM<sub>10</sub> non-attainment area. The Study also estimates that on-road sources produce 24,013 tons of PM<sub>10</sub> emissions annually, compared to 8,218 tons produced by non-road sources.

A decrease in automobiles on the road will assist in reaching the air quality standards that have been set by the U.S. Environmental Protection Agency (EPA). A commuter rail system operating during peak periods has the carrying capacity of 1.5 highway lanes, and the MAG Commuter Rail Strategic Plan (2007) showed that three locomotive driven bi-level coaches have the same capacity as 300 automobiles, carrying 300-400 passengers, 50 miles roundtrip. This reduction of automobiles on the road would aid in the reduction of PM<sub>10</sub> and CO pollutants, thus assisting the reach of attainment area status for these two pollutants.

#### **4.8 Project Goals**

Six overall project goals were identified as a result of the project statement of purpose and needs as previously identified in the document. The goals as they have been identified are listed below along with their accompanying objectives.

- **Goal 1: Improve mobility through and within the corridor and to major activity centers**
  - Objective: Increase overall corridor capacity for all modes
  - Objective: Improve overall travel safety for all modes of travel in the corridor
- **Goal 2: Provide an alternative to the single occupant vehicle for travel in the corridor**
  - Objective: Provide alternative transportation travel options in the corridor
  - Objective: Maximize the reduction in roadway travel demand through management practices and programs
  - Objective: Facilitate the reduction of truck traffic in the corridor by coordinating with freight railroad improvements
- **Goal 3: Improve the image of public transit in the corridor by providing rapid and convenient service**
  - Objective: Maintain or improve travel times within the corridor
  - Objective: Maintain or improve travel time reliability in the corridor

- **Goal 4: Improve the local economy**
  - Objective: Enhance access to jobs, entertainment, recreation and shopping for existing and future residents
  - Objective: Facilitate the improvement of freight operations and its related economic impact on the corridor
- **Goal 5: Improve environmental conditions in the corridor**
  - Objective: Minimize environmental impacts caused by increased travel demand
- **Goal 6: Provide a high-quality transportation alternative in the corridor**
  - Objective: Provide a cost-effective transit option in the Grand Avenue corridor
  - Objective: Provide a system that integrates effectively and efficiently with current and future transportation modes and systems

#### 4.9 Purpose and Need Summary

Each of the project’s purposes has corresponding needs, goals and objectives that are related to originally identified purpose. Table 6 summarizes the statement of purpose and need, the project’s goal and objectives, and also shows the relationships existing between them. However, these will continually be re-visited as the project moves forward and adjusted as needed to accommodate additional data, strategies, and regional plans.

**Table 6 Relationship of Purpose and Need, Goals and Objectives**

<b>Purpose</b>	<b>Need</b>	<b>Goals</b>	<b>Objectives</b>
Improve mobility between and among major activity centers in the corridor for all population groups	Increase in population and employment growth that is resulting in increased travel demand and intra-corridor trips	Improve mobility through and within the corridor and to major activity centers	Increase overall corridor capacity for all modes
			Improve overall travel safety for all modes of travel in the corridor
Provide high-speed, high-capacity multimodal solutions that help mitigate congestion and improve air quality	Roadway improvements have not kept pace with travel demand	Provide an alternative to the single-occupant vehicle for travel in the corridor	Provide alternative transportation travel options in the corridor
			Maximize the reduction in roadway travel demand through management practices and programs
			Facilitate the reduction of truck traffic in the corridor by coordinating with freight railroad improvements

Purpose	Need	Goals	Objectives
	Growth of VMT should be slowed to improve air quality	Improve environmental conditions in the corridor	Minimize environmental impacts caused by increased travel demand
Provide a high-quality transportation system that functions seamlessly with other planned transportation improvements in the region	A high-capacity, high-speed travel corridor is needed to connect the population and employment centers in the corridor with downtown Phoenix	Improve the image of public transit in the corridor by providing rapid and convenient service	Maintain or improve travel times within the corridor
		Provide a high-quality transportation alternative in the corridor	Maintain or improve travel time reliability in the corridor
			Provide a cost-effective transit option in the corridor
Provide a high-quality transportation system that facilitates and encourages economic development and redevelopment in the corridor	A high-capacity, high-speed travel corridor is needed to connect the population and employment centers in the corridor with downtown Phoenix	Improve the local economy	Provide a system that integrates effectively and efficiently with current and future transportation modes and systems
			Enhance access to jobs, entertainment, recreation, and shopping for existing and future residents
			Facilitate the improvement of freight operations and its related economic impact on the corridor

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