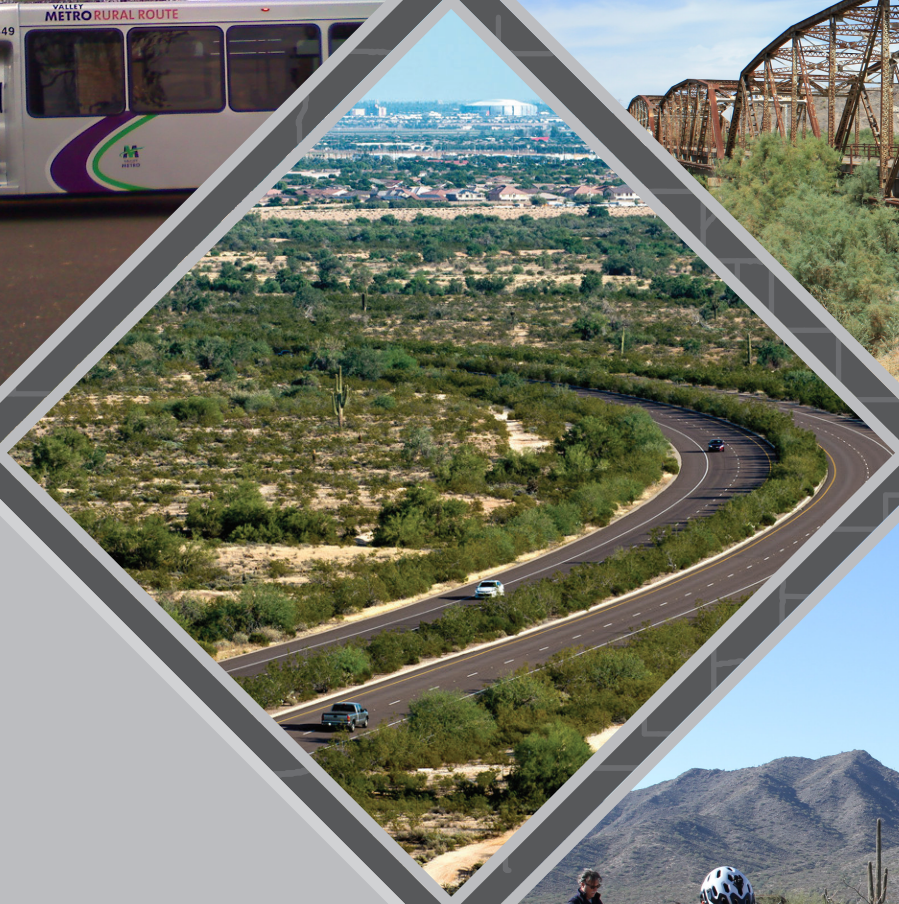

BUCKEYE IN MOTION

TRANSPORTATION MASTER PLAN

BUCKEYE, AZ

BUCKEYE IN MOTION

TRANSPORTATION MASTER PLAN

Transportation Master Plan
August 2019

Prepared for:

BUCKEYE, AZ

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Please see the next page.

INTRODUCTION 1

1.1 Introduction

The Buckeye 2018 Transportation Master Plan (TMP) is a planning tool to guide the city's future transportation needs based on Buckeye's ultimate buildout condition, when all development proposed in the adopted Imagine Buckeye 2040 General Plan Future Land Use Plan has been completed. The TMP provides recommended multimodal transportation improvements to accommodate growth within Buckeye's Municipal Planning Area (MPA). Based on the existing and forecasted conditions for Buckeye, the TMP establishes a strategy for the development of a comprehensive transportation network that efficiently serves multiple modes of transportation including the street network, transit services, active transportation facilities, aviation, rail, and freight.

The TMP was developed as an implementation strategy of the City's Imagine Buckeye 2040 General Plan allowing for a seamless link between land use and transportation infrastructure decisions for the City. Ultimately, the TMP identifies short-term, mid-term, and long-term priorities for the transportation system.

The TMP addresses infrastructure needs that exist in 2018 as well as future needs aligned with future land use and development patterns. The TMP provides long-term guidance for the planning of roadway, transit, and non-motorized transportation improvements through the buildout of the City.

The Buckeye TMP has two defining features:

- **Comprehensive.** The TMP covers a wide range of transportation issues including roadway network characteristics, modal plans for the various transportation system users, and an implementation process. This TMP supports and acknowledges the recommendations from existing air and rail plans, which are referenced throughout this TMP.
- **Long-range.** The TMP provides guidance on reaching a goal envisioned at buildout of the community. To reach this envisioned future, the TMP will include recommendations and actions that address short-, mid-, and long-term needs.

There are two primary documents that are part of the Buckeye Transportation Master Plan:

- **Map Atlas.** This document provides a detailed description of the city's existing transportation network, as of 2017, within the City of Buckeye and the City's MPA.
- **Transportation Master Plan.** This document contains the assessment of the future roadway network and identifies infrastructure needs beginning today through the buildout of the MPA. The TMP identifies an implementation methodology that executes the goals and policies of the TMP and Imagine Buckeye 2040 General Plan.

This Introduction Chapter includes the following sections:

- **Section 1.1** **Introduction.** The purpose of the TMP.
- **Section 1.2** **Transportation Master Plan Organization.** The organization of chapters in the TMP.
- **Section 1.3** **A Vision for Growth.** A description of how the TMP will accommodate future growth in Buckeye.
- **Section 1.4** **A Vision for a Multimodal System.** A description of how the TMP will connect different modes of transportation.
- **Section 1.5** **Planning Area.** The regional and local setting of the planning area and the plans and studies that are relevant to this TMP.
- **Section 1.6** **Plan Development Process.** The process for how the TMP was developed, including the relationship to the Imagine Buckeye 2040 General Plan goals and policies, the public involvement process, and the documents that support the TMP.
- **Section 1.7** **Key Issues.** A description of the key issues that were identified during the development of the TMP.

1.2 Transportation Master Plan Organization

The Buckeye TMP has been organized into mode-specific plans that are divided into separate chapters. Additionally, the chapters provide the foundational information to the TMP process and guidance as to how the TMP will be implemented. The Buckeye TMP is organized into the following Chapters:

- **Chapter 1 Introduction:** The Introduction provides an overview of the purpose of the TMP as well as the planning area, plan development process, key issues, and the TMP organization.
- **Chapter 2 Street Chapter:** The Street Chapter provides guidance as to the ultimate buildout of the roadway network with a focus on vehicular mobility.
- **Chapter 3 Transit Chapter:** The Transit Chapter provides guidance as to the potential expansion of transit service and park-n-ride facilities to support high volume origin and destination mobility throughout the planning area.
- **Chapter 4 Active Transportation Chapter:** The Active Transportation Chapter provides guidance as to the bicycle and pedestrian network to be implemented throughout the planning area.
- **Chapter 5 Aviation Chapter:** The Aviation Chapter examines the recommendations from the Buckeye Municipal Airport Master Plan, guiding aviation growth in Buckeye.
- **Chapter 6 Rail Chapter:** The Rail Chapter examines the recommendations from various state and regional rail plans in support of future freight and commuter rail investments.
- **Chapter 7 Freight Chapter:** The Freight Chapter examines the distribution of goods serving the broader southwest region and outlines a truck route plan for the City of Buckeye.
- **Chapter 8 ITS Chapter:** The Intelligent Transportation System (ITS) Chapter examines recommendations from the ITS Strategic Plan, guiding the application of technologies, such as traffic signals, into the surface transportation system and the operations of such technologies.
- **Chapter 9 Recommendations and Implementation:** This chapter provides a planning-level implementation matrix for the recommendations identified in previous chapters. The matrix includes the project name and brief description, the anticipated

implementation timeframe, the planning-level cost estimate, and the responsible party(ies). Additionally, this chapter describes the anticipated operations and maintenance of the surface transportation system.

1.3 A Vision for Growth

The TMP is a planning document, setting goals and implementation strategies to address the City of Buckeye's current and future multimodal transportation needs. It identifies the ultimate transportation network when the City reaches buildout development conditions. The City's future transportation needs are based on the ultimate buildout condition, including Buckeye's future land uses as defined in the Imagine Buckeye 2040 General Plan. A primary aspect of growth to consider is the entitlements granted to numerous developments through the City's Community Master Plans (CMPs). These CMPs outline where significant growth is anticipated to occur and provide conceptual design of the transportation improvements needed to support each CMP.

The Buckeye TMP represents the community's long-range vision for how the transportation network should evolve to serve employers, residents, and visitors in a fast-growing region.

Understanding how much growth will occur and where in the City it is anticipated to develop is key in planning for infrastructure in a fiscally-conscious manner. Similar to many communities in the Phoenix region, much of the transportation infrastructure cost is paid by the developer at the time of development. That is, the developer is responsible for constructing transportation infrastructure within their development area, to standards set forth by the City of Buckeye.

The Maricopa Association of Governments (MAG) I-10/Hassayampa Valley Transportation Framework Study was a transportation planning study completed in 2008 of approximately 1,400 square miles in western Maricopa County, including the City of Buckeye. In 2008, the City formally adopted the I-10/Hassayampa Valley Transportation Framework Study network (Hassayampa Network) as the future transportation network for the City of Buckeye. Since that time, many CMP developments have been approved, which have included anticipated changes to the future transportation network. A critical step in the TMP process was conducting an assessment to compare the Hassayampa Network against the planned infrastructure as identified in the CMP development approvals that have been completed since 2008. The updated transportation network along with updated population and employment projections were utilized in travel demand modeling to better plan for anticipated areas of growth. The population and employment projections are discussed further in Section 1.7 of this Chapter. The street network revisions are documented in Chapter 2 of this TMP.

This TMP also assesses the transportation needs anticipated in 2040 in conformity with regional planning horizons set forth by MAG, which is further discussed in Chapter 2. Identifying regionally-significant needs within the 2040 planning horizon is an important step for MAG's air quality conformity reporting and is consequently critical for the City to be able to effectively compete for federal funding sources in the MAG region.

Through this planning process, two planning horizons were utilized in modeling the travel demand in Buckeye in the future. The 2040 travel demand model results were used by the project team to identify mid-term priorities for the transportation system. The buildout travel demand model scenario results were used by the project team to identify the ultimate transportation network for Buckeye.

1.4 A Vision for a Multimodal System

The Imagine Buckeye 2040 General Plan includes a strategy recommendation for the City to create a transportation network that safely accommodates all users. Therefore, an important concept for Buckeye's future transportation system is the mobility, connectivity, and proximity of multiple modes of transportation. Within the future transportation network, each of these transportation modes should complement the other in a safe and efficient manner. Therefore, the Buckeye TMP focuses on the integration within and between different transportation modes, while also balancing the needs of the community and the economy. Ultimately, the Buckeye TMP provides recommendations for each transportation mode in light of the land use context described in the Imagine Buckeye 2040 General Plan, and provides a long-range vision for the following transportation system components:

- Streets
- Transit Service and Facilities
- Pedestrian and Bicycle Facilities
- Airports
- Railways
- Freight
- Intelligent Transportation Systems (ITS)

Figure 1-1 illustrates the integrated transportation system that the TMP is planning for.

Planning for each of these modes of travel allows the City to better provide a range of transportation choices. Additionally, it allows the City to determine future capital improvement projects and funding for new infrastructure as well as ongoing maintenance and operations. Recommendations for each of these modes of travel not only support economic development and quality of life goals, but also were derived with an understanding of how each mode of travel is interrelated to other modes of travel.

Due to the City's multiple transportation system modes, it is necessary for each mode to link together to provide a multimodal network that supports efficient mobility and transportation operations. For example, the City's street network serves multiple purposes including the movement of personal vehicles, trucks, transit vehicles, bicyclists, and pedestrians as well as providing access to the airport or across railways. Pedestrian and bicycle networks are influenced by the level of vehicle traffic that impacts the ability to safely accommodate pedestrians and bicyclists. Freight planning includes a combination of truck freight (via streets), rail freight (via railways), and air freight (via the airport) which aligns with modern intermodal freight operations throughout the U.S. Lastly, ITS provides for efficient traffic management for various travel modes, allowing for safer, more coordinated, and efficient use of the transportation network.

By including all modes of travel in the Buckeye TMP, the City can more effectively plan for priorities by each mode as well as the system as a whole; allowing the City to balance economic development and quality of life goals.

Figure 1-1: Integrated Transportation System

1.5 Planning Area

Regional Setting

Located in western Maricopa County Arizona, Buckeye is positioned as the western gateway to the larger Phoenix metropolitan area. Regional access to and from Buckeye is provided by Interstate 10 (I-10), which runs east-west through central Buckeye connecting Phoenix to southern California, and State Route 85 (SR 85), which runs north-south through Buckeye connecting I-10 and Interstate 8 (I-8). I-8 begins in San Diego, runs through Gila Bend and connects to I-10 in Casa Grande. This connection allows SR 85 to act as an I-10 bypass, allowing freight traffic to avoid the congestion in the Phoenix metropolitan area.

Buckeye is located about 35 miles west of downtown Phoenix. Buckeye is a member of the area's Metropolitan Planning Organization, MAG. As a member of MAG, Buckeye has steadily increased its role in the region including being involved in several regional transportation studies that have identified significant investments in the Buckeye planning area. Buckeye's location within the southwest region of the U.S. is displayed in **Figure 1-2** and Buckeye's location within the Phoenix metropolitan area is displayed in **Figure 1-3**.

Figure 1-2: Buckeye's Regional Setting

Local Setting

The planning area for the TMP comprises the Buckeye MPA. The MPA includes the city limits and extends beyond the City boundary to cover a larger area of influence where the City has planning jurisdiction. At 642 square miles, Buckeye has the largest MPA in Maricopa County. By comparison, the City of Phoenix is 518 square miles. Currently, 392 square miles of the MPA are annexed in the city limits. The Buckeye MPA is bounded by Perryville Road on the east, 379th Avenue on the west, Woods Road on the south, and Black Mountain Road on the north. The City of Buckeye MPA includes Maricopa County islands located within the City, as well as other unincorporated areas directly adjacent to the City but under Maricopa County jurisdiction. County islands are unincorporated properties under county jurisdiction; however, they are surrounded by the City of Buckeye incorporated area. The City of Buckeye MPA is shown on **Figure 1-4**.

Surrounding Jurisdictions

Buckeye is part of the west Maricopa County area, commonly referred to as the 'West Valley'. In addition to Buckeye, the West Valley is made up of Wickenburg, Goodyear, Surprise, Litchfield Park, Avondale, Tolleson, Glendale, Youngtown, El Mirage, Peoria, and Gila Bend. Given the large size of Buckeye's MPA at 642 square miles, the City is beginning to emerge as a regional leader of growth in the West Valley.

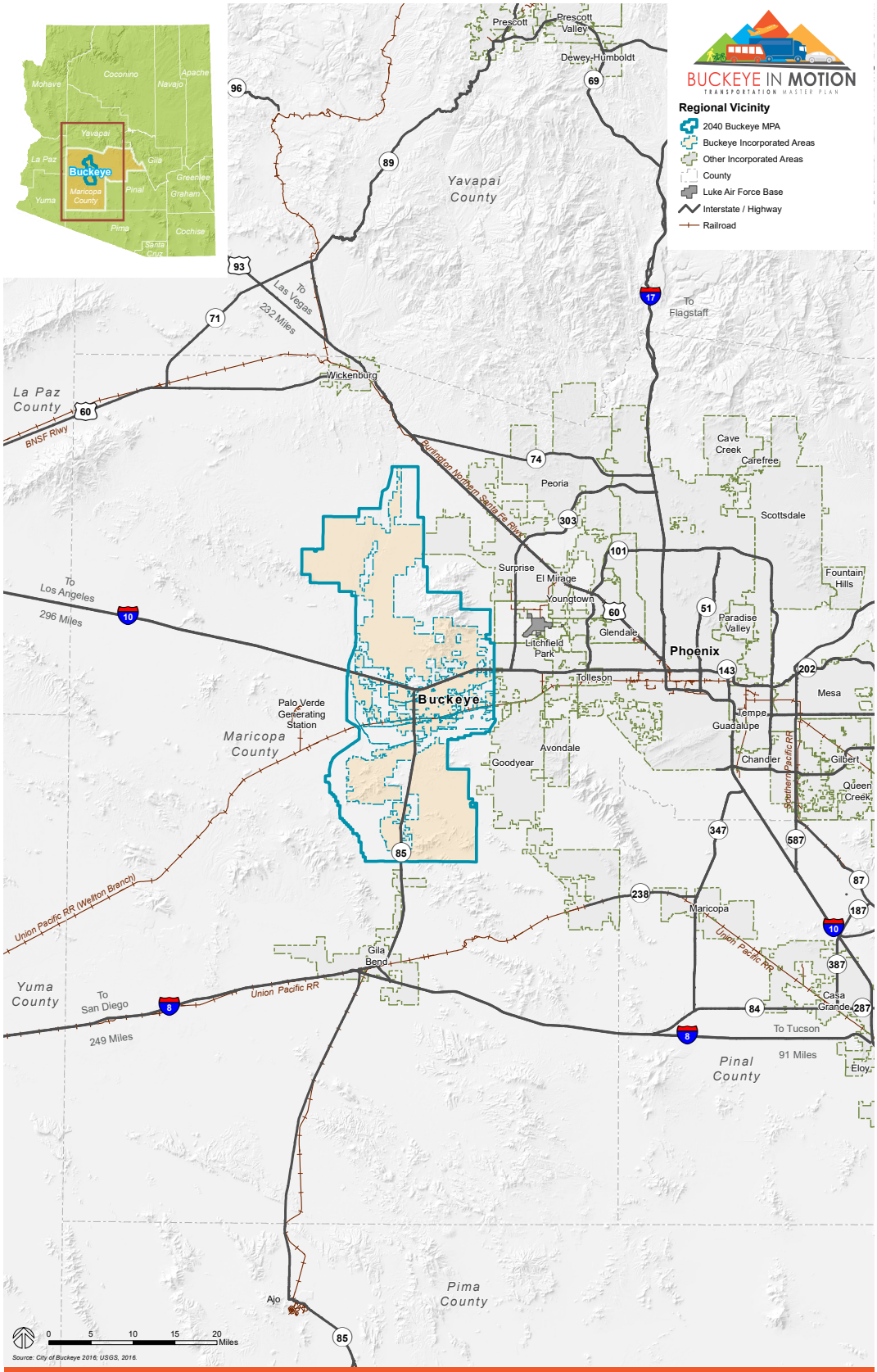

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Figure 1-3
Regional Vicinity

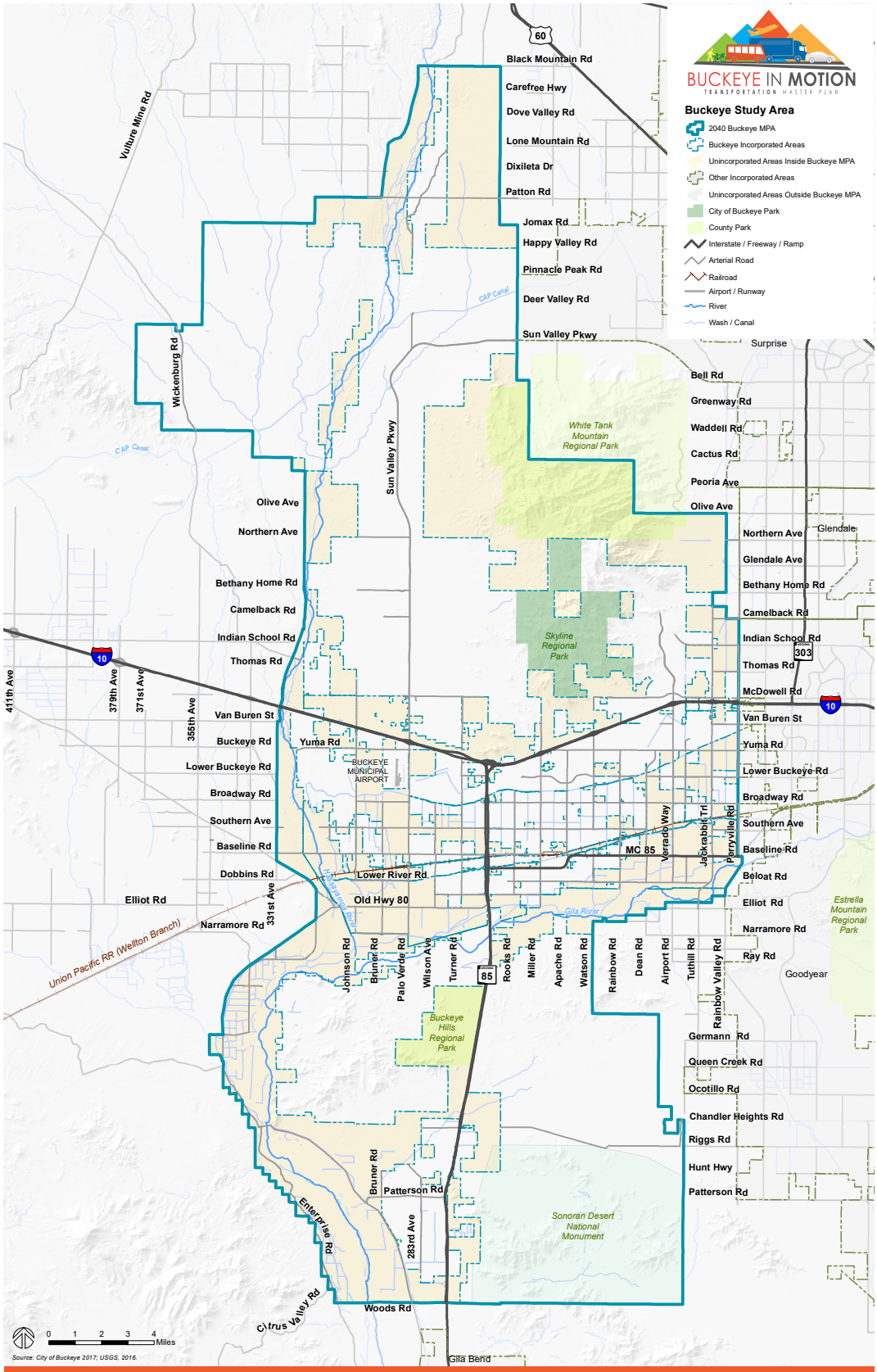


Figure 1-4
Buckeye Study Area

Related Plans and Studies

The built environment of the City of Buckeye has been studied in several previous transportation planning efforts. In some instances, the City transportation network was a direct focus of the planning effort, and in other instances the City was a component of a larger, regional study. Findings from these studies are valuable to this TMP as they have contributed to the development of the transportation system in place today and programmed for in the future. Furthermore, reviewing previous plans and studies ensures the current assessment is consistent with past efforts and their decision-making processes. When modifications to previous recommendations are justified, they are documented as part of this TMP effort. Provided in **Table 1-1** is a summary of the key plans and studies with relevance to the TMP. Publishing agencies include the City of Buckeye, Maricopa County Department of Transportation (MCDOT), Arizona Department of Transportation (ADOT), Valley Metro, and Maricopa Association of Governments (MAG).

Table 1-1: Related Plans and Studies

Publishing Agency	Title	Published Date
City of Buckeye	Buckeye Municipal Airport Master Plan	2007
	Town of Buckeye 2008 General Plan Update	2008
	Buckeye Municipal Airport Drainage and Utilities Study	2008
	Buckeye Municipal Airport Noise Compatibility Study	2009
	Buckeye Capital Improvement Program FY 11/12-FY 17/18	2012
	Parks and Recreation Master Plan	2016
	ITS Strategic Plan	2018
	Imagine Buckeye 2040 General Plan	2018
	Bike and Pedestrian Master Plan	Ongoing
Maricopa County DOT	Hidden Waters Parkway Corridor Feasibility Study (Watermelon Road to Interstate 10)	2010
	McDowell Parkway Corridor Feasibility Study (339th Avenue to Dean Road)	2010
	Turner Parkway Corridor Feasibility Study (Interstate 10 to State Route 74)	2010
	Major Streets and Routes Plan (MSRP)	Revised 2011
	Northern Parkway/Tonopah Parkway Corridor Feasibility Study	2011
	Deer Valley Parkway Feasibility Study (US 60 to Wild Rose Parkway)	2012
	Hidden Waters Parkway North Feasibility Study (Interstate 10 to State Route 74)	2012
	Yuma Parkway Feasibility Study (Salome Highway to Palo Verde Road)	2012
	Wild Rose Parkway Feasibility Study (Sun Valley Parkway to US 60)	2013
	Camelback Parkway Feasibility Study (Sun Valley Parkway to Tonopah Parkway)	2013
	Dove Valley Parkway Feasibility Study (US 60 to Hidden Waters Parkway)	2013
	Greenway Parkway Feasibility Study (Turner Parkway to Hassayampa Freeway)	2014

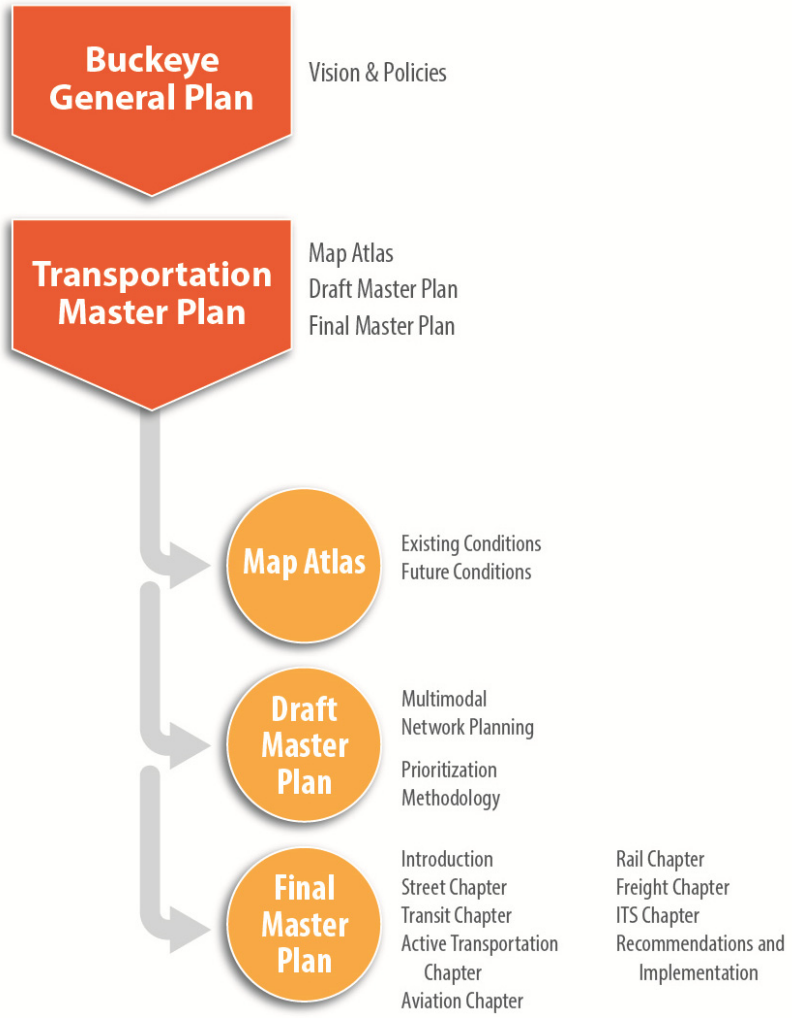
Table 1-1: Related Plans and Studies (continued)

Publishing Agency	Title	Published Date
Maricopa County DOT (continued)	Wintersburg Parkway Feasibility Study (Salome Parkway to Turner Parkway)	2014
	Southern Parkway (Salome Highway to State Route 85) Feasibility Study	2014
	Transportation Improvement Program FY 2018-2022	2017
	Transportation System Plan (TSP) 2035	2017
	Active Transportation Plan	2018
Arizona DOT	Long-Range Transportation Plan 2010-2035	2011
	State Rail Plan	2011
	Passenger Rail Study: Tucson to Phoenix	2011
	Arizona State Freight Plan	2014
	I-11 and Intermountain West Corridor Study – Corridor Justification Report	2014
	I-11 and Intermountain West Corridor Study – Corridor Concept Report	2014
	I-11 Tier 1 Environmental Impact Statement – Scoping Summary Report	2017
	I-11 Draft Tier 1 Environmental Impact Statement	2019
Valley Metro	Buckeye Transit Plan	2016
Maricopa Association of Governments	I-10/Hassayampa Valley Roadway Framework Study	2007
	I-10/Hassayampa Valley Roadway Framework Study (Town of Buckeye I-10 Access Review and Evaluation)	2008
	I-8/Hidden Valley Transportation Framework Study	2009
	Commuter Rail System Study Update	2010
	Southwest Valley Local Transit System Study (SWVLTSS)	2013
	Hassayampa Valley Rail Corridors Analysis Update	2013
	Designing Transit Accessible Communities Study	2013
	Wellton Branch Railroad Rehabilitation Study	2014
	I-10 (Papago Freeway)/Dean Road Interchange Feasibility Study	2014
	Transportation Improvement Program FY 2014-2018	2014
	2035 Regional Transportation Plan	2014
	Annual Report on the Status of the Implementation of Prop 400	2015
	Transportation Improvement Program FY 2018-2022	2017
	Regional Freight Network Report	2017
	2040 Regional Transportation Plan	2017
	State Route 30/Tres Rios Freeway Scoping Study	-
	Active Transportation Plan	Ongoing
	Regional Transit Framework Study Update	Ongoing

1.6 Plan Development Process

Development of the TMP occurred over a multi-year process, starting with the 2018 General Plan Update, *Imagine Buckeye 2040*. The TMP includes three primary components: Map Atlas, Draft Master Plan, and Final Master Plan. The project team utilized public and stakeholder feedback via the General Plan Update and information from the Map Atlas in assessing future travel flows and refining the Transportation/Circulation and Bicycling Element from the Buckeye General Plan. The TMP is a dynamic planning document, likely to result in periodic updates as new growth, demands, and technologies emerge. Figure 1-5 illustrates the planning process including the General Plan and the three phases of the Transportation Master Plan, which are: Map Atlas, Draft TMP, and Final TMP. The chapters within this TMP address streets, transit, active transportation, aviation, rail, freight, ITS, and implementation.

Figure 1-5: Buckeye Transportation Master Plan Process



Imagine Buckeye 2040 General Plan Process and Policies

The Imagine Buckeye 2040 General Plan was adopted by the City Council and was ratified by the voters in the Fall of 2018. In the General Plan, a series of goals, policies, and implementation actions were included to guide future development in Buckeye, which includes the transportation network. The General Plan included an implementation action for completion of this study, which this TMP implements. The General Plan encourages multimodal mobility and a comprehensive transportation system through goals and policies, which are further expanded upon in subsequent chapters. These goals and policies served as a guiding framework for the recommendations of this TMP. The specific goals and policies of the Imagine Buckeye 2040 General Plan are as follows:

Transportation Goal 1: Buckeye is a connected community with an efficient multimodal transportation network.

Policies:

- The City of Buckeye will require new development to provide connectivity to existing transportation networks to provide accessibility and efficient connections to adjacent parcels, neighborhoods, Activity Centers, and the region.
- New development should provide active transportation facilities, such as pedestrian paths, bike paths, and trails that enhance connectivity between community green spaces and to regional parks and the Maricopa County Trail system.
- The City of Buckeye should ensure that the transportation network is managed, operated, and maintained efficiently.
- The City of Buckeye should design roads for multimodal accessibility, including transit, bicycles, and pedestrians.
- Collector streets should continue and connect community master plans to provide alternative pedestrian, bike, and transportation routes without dependency on the arterial network.
- The City of Buckeye should ensure that transit options are provided to Activity Centers and other destination locations.
- The City of Buckeye will support expanding capacity on the existing I-10 and SR85.
- The City of Buckeye will actively promote and lobby for the expansion and development of new key transportation facilities, including commuter rail and other regional transportation opportunities.

Transportation Goal 2: Buckeye has a regional approach to transportation planning.

Policies:

- The City of Buckeye will continue to use the adopted I-10/Hassayampa Valley Roadway Framework Study as the base for its future roadway network.
- The City of Buckeye will work to expand partnerships with ADOT, MCDOT, MAG, and adjacent municipalities when planning and funding transportation infrastructure.
- The City of Buckeye should regularly update transportation plans consistent with regional objectives.
- The City of Buckeye should work with MCDOT to assess the future viability of attached or detached bicycle and pedestrian paths on Sun Valley Parkway.
- The City of Buckeye should seek intergovernmental agreements with canal districts, utility providers, and the flood control district for shared use of maintenance roads for pedestrians and bicyclists.

Transportation Goal 3: Buckeye has a roadway system that is safe and efficient.

Policies:

- The City of Buckeye should plan for future transportation corridors by identifying and preserving adequate rights-of-way during the planning and development process.
- The City of Buckeye should update the Capital Improvement Plan with needed road improvements on an annual basis.
- The City of Buckeye should improve the flow of traffic by addressing missing links in the arterial network.
- The City of Buckeye should designate appropriate truck routes that provide efficient connections to industrial and commercial uses and do not adversely impact residential land uses.
- The City of Buckeye should continue to support the update and implementation of the Intelligent Transportation Systems (ITS) Master Plan.
- New development should provide connectivity to adjacent neighborhoods to minimize arterial dependency.

Transportation Goal 4: Buckeye's multimodal system provides alternatives for modes of travel.

Policies:

- The City of Buckeye should integrate the regional transit system with the local Buckeye circulator services.
- The City of Buckeye should continue to work with transit agencies and surrounding jurisdictions for expanded transit services.
- The City of Buckeye should explore options for adding high capacity transit, such as commuter rail.
- The City of Buckeye should promote and encourage community-wide transit ridership.
- The City of Buckeye should continue to provide transportation options for the elderly and special needs residents.
- The City of Buckeye should continue to promote methods of air pollution reduction related to transportation, such as the Travel Reduction Program.
- New developments will plan, design, and construct, where appropriate, roadways in conformance with the Future Transportation Network.
- The City of Buckeye will identify and pursue dedicated transportation funding sources for all City transportation needs.
- The City of Buckeye will support work to reopen the UPRR Wellton Branch.

Transportation Goal 5: The Buckeye Municipal Airport is a key growth center and protected from encroachment.

Policies:

- The City of Buckeye should continue to support the expansion of operations at the Buckeye Municipal Airport in close coordination with Luke AFB.
- Proposed land uses and development proposals will be consistent with the 2007 Buckeye Municipal Airport Master Plan.
- Multimodal connections should be provided to the Buckeye Municipal Airport.
- The City of Buckeye will improve public awareness of the airport through public outreach and education campaigns.
- The City of Buckeye should expand telecommunications at the airport to support "state of the art" technology, such as wireless internet access and fiber optics.
- The City of Buckeye will support work to extend the runway at Buckeye Municipal Airport in close coordination with Luke AFB.

Transportation Goal 6: The bicycle and pedestrian circulation system is a well-connected and maintained network, enabling access to all parts of the city.

Policies:

- The City of Buckeye should utilize MAG's Bicycle and Pedestrian Master Plan and the City's Parks and Recreation Master Plan for guidance until the City of Buckeye adopts its own Bicycle and Pedestrian Master Plan through the pending Buckeye Transportation Master Plan.
- The City of Buckeye will promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provide access to key destinations, including community facilities (such as schools, libraries, and parks), shopping areas, jobs, and activity centers, with appropriate linkages to neighborhoods.
- The City of Buckeye should connect parks to planned bicycle routes and recreation corridors, including trails, such as along the Hassayampa River, Gila River, Skyline Park and White Tank Mountains Regional Park.
- The City of Buckeye will develop a multimodal policy that supports all modes of transportation and addresses the inclusion of pedestrian and bicycling facilities in new and existing road corridors, where appropriate.
- The City of Buckeye should provide bicycle access in and near Activity Centers, neighborhoods, community centers, parks, and other appropriate destinations.
- The City of Buckeye will require new development to provide and maintain appropriate bicycle infrastructure such as bicycle racks, lockers, lanes, and paths.
- The City of Buckeye should ensure that streets in Activity Centers support high levels of pedestrian activity.

Public Involvement Process

Public and stakeholder input is essential to creation of the TMP and results in a plan that is consensus-based with feasible solutions. The Buckeye TMP public involvement process was coordinated with the Buckeye General Plan Update process. **Figure 1-6** illustrates the extent of public involvement in this extensive outreach process throughout the combined General Plan and TMP process. In total, there were over 75 public outreach efforts used during the development of the General Plan and the TMP, which led to communications with over 260,000 residents, business owners, land owners, and other stakeholders. Outreach efforts included community workshops, three of which were a part of the General Plan process, presentations, meetings, open houses, distribution of flyers and public notices, surveys, social media updates, and emails blasts.

Public involvement for the TMP process involved various outreach efforts which have been summarized into four outreach types:

- Individual Interviews
- Development Partnering Focus Groups
- Public Workshops
- Public Hearings and Workshop

Each of these outreach efforts are described in **Appendix A: Stakeholder Summary Report**.

Figure 1-6: Stakeholder Involvement Summary

Community Workshop Participants

Public comments and input from the public involvement process were used to provide overall guidance in the development of the policies and planned improvements associated with each mode of transportation in the TMP.

Map Atlas

The Buckeye TMP began with a review and analysis of the existing conditions within the MPA. This was done through the creation of a TMP Map Atlas (**Appendix B**). The Map Atlas was designed to summarize the existing conditions of Buckeye in a concise and graphic format. Each topic of the Map Atlas presents summary text and quick facts capturing important highlights, which are complemented with maps, tables, graphs, photos, and infographics. Several topics that influence transportation planning are explored including population, employment, land use, environmental features, and transportation network characteristics. Therefore, the Map Atlas provides foundational information regarding existing and future conditions within the City of Buckeye, which was used in creating the new TMP. The TMP Map Atlas contains six chapters which are outlined as follows:

- 1: Introduction
  - Map Atlas Overview
  - Regional Setting
  - Local Setting
  - Population & Employment
  - Development Patterns
  - Environmental Features
- 2: Transportation Systems
  - Transportation System
  - Roadway Network
  - Alternative Modes
  - Air & Rail Services
- 3: Major Roadways
  - Major Roadways
  - Crash Locations
  - Crash Types
  - Pavement Maintenance & Preservation
  - Volumes, Capacity & Level of Service
- 4: Network Barriers
  - Network Barriers
  - Utility Corridors & Power Transmission Lines
  - Waterways & Irrigation Canals
- 5: Future Conditions
  - Future Conditions
  - Forecasting Development Activity
  - Programmed Improvements
  - Future Circulation
- 6: Summary & Next Steps
  - Summary
  - Next Steps

The project team utilized information from the Map Atlas in assessing future travel flows, in refining the Future Circulation Element from the Buckeye General Plan, and in the creation of the TMP chapters contained herein. The section that follows provides an overview of the Key Issues identified through a combination of stakeholder involvement and transportation analysis.

1.7 Key Issues

Key transportation issues were identified during the TMP process. These issues included planning for growth, economic development, regionally-significant corridors, multimodal options, and maintaining transportation infrastructure. While these issues may continue to evolve in the future, it was important to consider these issues when developing recommended strategies for the future transportation network.

Planning for Growth

The City of Buckeye and the West Valley communities have experienced rapid growth over the last 20 or more years - Buckeye is currently the fifth fastest growing city in the nation. Developers have been drawn to Buckeye because of inexpensive land and proximity to nearby job markets in the neighboring West Valley communities. Increases in travel demand are an effect of population and employment growth.

In 2015 the City conducted a Special Census that adjusted the base-year demographics which were then used to update the population, dwelling unit, and employment projections conducted by MAG. The population, dwelling unit, and employment projections for 2050 were updated in MAG's most recent Socioeconomic Projections publication. While the projections are official figures, it is important to note that actual growth for a city is influenced by many factors and may vary from this value.

Growth in Population and Dwelling Units

Base year population and employment data is derived from the 2016 MAG socioeconomic data. **In 2015, the City of Buckeye conducted a Special Census that provided a more accurate population and dwelling unit count and provided this updated information to MAG.** This information is used to project population densities into the future, which will be indicative of future transportation demands. Population density is the amount of people per square mile who live within a defined geographic area. Identifying where these clusters of population are located in Buckeye is important for planning future growth and development.

Table 1-2 lists the past average population density (people per square mile) in 2014, and the anticipated population density in 2040 and at buildout. As noted in the Imagine Buckeye 2040 General Plan, the population is expected to grow to 310,800. This increase in population will contribute to population density, making it necessary to plan for high intensity and density areas throughout the city. As shown on Table 1-2, population densities are projected to increase by 341% between 2040 and buildout.

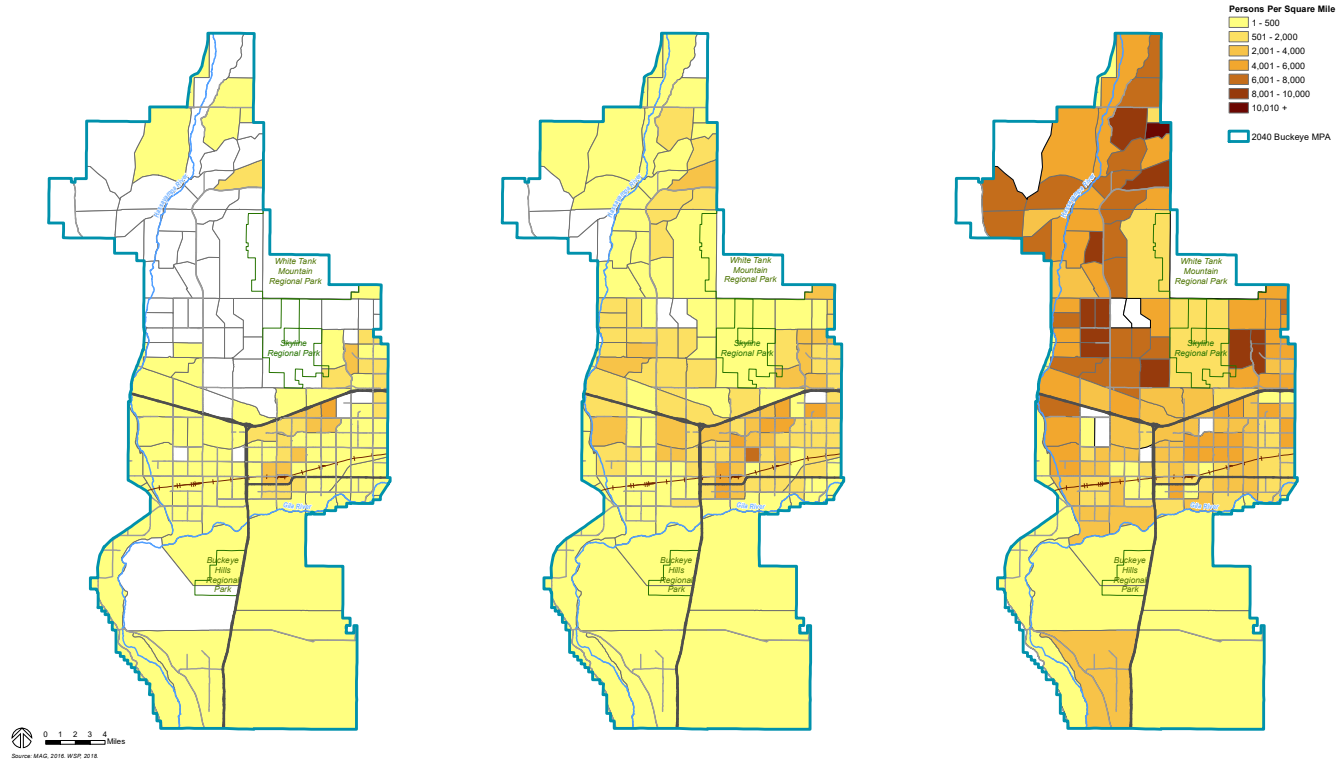
Table 1-2: Average Population Density Per Year

2014	2040	Buildout
67.5 people per square mile	316.0 people per square mile	1,395.0 people per square mile

Source: MAG 2016; WSP 2018.

The population density for all three timeframes are shown on Figure 1-7. By 2040, the highest population density will be within the downtown area. By 2040, it is projected that high population densities will be on both the north and south sides of I-10 and will also be concentrated west of SR 85, unlike the 2014 population density. The city's population is also anticipated to spread north along Sun Valley Parkway. In 2014, the highest concentration of population density was in the Verrado area as well as surrounding the downtown area and south of I-10 along Yuma Road.

As shown on the maps, population densities will continue to increase past 2040. At buildout the greatest population density is anticipated to be located north of McDowell Road within the CMPs that are planned within this area. The buildout projections indicate that the highest densities will be located north of I-10 along Sun Valley Parkway, and within the CMPs, with high concentrations in Tartesso, Douglas Ranch, Festival Ranch, and Verrado. While there will be a population concentration south of I-10 and north of the Gila River, the population densities will not be as great as the areas north of I-10. Although the majority of the highest concentration of population density is projected to be within the CMPs, there is also population growth anticipated surrounding the CMPs.



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2014 Population Density

2040 Population Density

Figure 1-7

Buildout Population Density

Growth in Employment

Strongly linked to population growth is employment growth. As populations increase so too do commercial developments that create jobs. Furthermore, cities often experience additional non-commercial job growth in the areas of manufacturing, industry, and logistics. Buckeye will experience significant employment growth due to proximity to the interstate system. Specially, Buckeye is connected regionally through I-10 and SR 85, making the city a gateway into the Phoenix Metropolitan Area. The addition of the future SR 30 and I-11 will further support economic opportunities and the expansion of industry in the city.

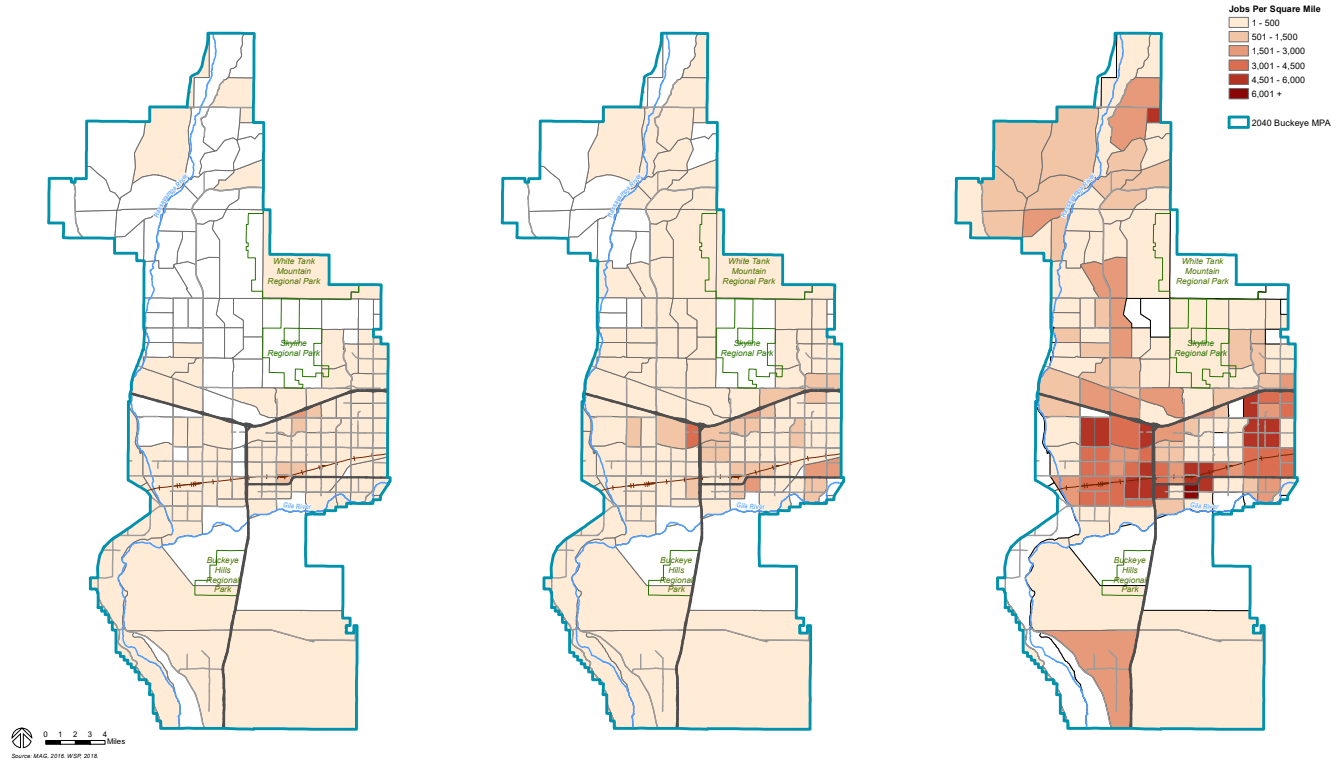
Employment projections indicate Buckeye will grow considerably in the future. **Table 1-3** lists the employment density in 2014, which was calculated as jobs per square mile, and the anticipated employment density in 2040 and at buildout. The table indicates that the city will experience increased employment growth that generally aligns with the population density growth. From 2040 to buildout, employment density is projected to increase by over 600%. Like population density growth, this employment growth will increase demand for transportation options for commuting to and from the workplace and the delivery of goods and services.

Table 1-3: Average Employment Density Per Year

2014	2040	Buildout
11.2 jobs per square mile	61.3 jobs per square mile	430.6 jobs per square mile

Source: MAG 2016; WSP 2018.

Understanding where employment growth will occur is important for planning connections in the transportation network. **Figure 1-8** shows where the concentration of jobs will be located for all three timeframes. At buildout, it is anticipated that employment will be concentrated in the area south of I-10 and north of the Gila River. Jobs are also projected to be prominent by Patton Road. Other areas where employment will be growing is Patterson Road, Sun Valley Parkway, and in the Douglas Ranch CMP. Similar to the 2040 projections, at buildout, it is projected that employment densities will be the greatest between I-10 and the Gila River, the densest employment areas being on the intersection of Verrado Way and Lower Buckeye Road.



Matrix DESIGN GROUP

2014 Employment Density

2040 Employment Density

Figure 1-8

Buildout Employment Density

By 2040, it is projected that employment density will spread along the south end of the I-10 corridor with some concentration north of I-10, along McDowell Parkway. There is also an anticipation for employment density to increase along the north and south sides of the Union Pacific Rail Road (UPRR) rail line. In 2014, employment density was limited to the area south of I-10 and east of SR 85. The greatest employment density was along the intersection of Watson Road and Yuma Road.

The projected geographical location of population and employment growth was used to determine where there are gaps in the current transportation network and how the future network can provide additional connectivity to these clusters.

Economic Development

Economic development is paramount in achieving the vision for growth in Buckeye. Existing developments are concentrated along Interstate 10 (I-10) as well as State Route 85 (SR 85). Both highways will continue to provide regional connectivity to Buckeye's Activity Centers, supporting economic development. Because both highways are limited to the central and southern end of Buckeye, Parkways and Arterial roadways will play a significant role in economic development in the northern end of Buckeye until a future I-11 corridor is developed. Furthermore, localized improvements to freight facilities, including designated truck routes and enhanced rail crossings are addressed in this TMP.

Regionally-Significant Corridors

There are three existing regionally-significant corridors that traverse the Buckeye MPA – I-10, SR 85, and Sun Valley Parkway. Until future freeways are constructed, Sun Valley Parkway will serve as a spine for regional mobility and will connect to adjacent roadways that serve in expanding economic development opportunities in northern Buckeye. There are other major corridors that are planned to run through Buckeye, such as I-11, SR 30, and a supporting network of Parkways and Arterials that make up the Hassayampa Valley Transportation Framework Network.

Additionally, there are various needs associated with the existing transportation network in Buckeye. The most apparent of which is a lack of connectivity and roadway capacity, particularly in the area between I-10, MC 85, SR 85, and Perryville Road; as well as expansion of I-10 to three lanes in each direction between Verrado Way and SR 85. Furthermore, many of these same corridors have high crash incidences that may be addressed through engineering solutions.

Looking to the future, as the community continues to grow, the planning for regional facilities including Arterials, Parkways, I-11, and SR 30 will become an increasingly critical issue. Planning for the addition of these corridors is important to ensure there is connectivity to a larger region, expanding the City's economic development market area. Several of these regionally-significant corridors are currently being studied by partnering agencies and the City of Buckeye has been an active partner in these planning efforts. These studies were evaluated for this TMP and were instrumental in creating recommendations for the future Buckeye transportation network.

Multimodal Options

In Buckeye, there are currently limited multimodal options that expand beyond personal vehicles. While there are some multimodal facilities, there is a lack of consistent connectivity between the northern and southern ends of the City.

Several designated bicycle routes exist throughout the City; however, most of these routes are located on ADOT or MCDOT-owned roadways and do not provide a contiguous network for bicycle or pedestrian users to safely navigate through the city.

There is currently one Valley Metro bus route in Buckeye that provides two types of service: local circulator and regional connector. This one route provides public transportation to a portion of the City and connects to other municipalities to the east as well as Gila Bend to the south. As the City continues to grow and as developments that generate transit trips are introduced, expansion of the existing transit system will be an important consideration. However, much of this will depend upon connectivity to neighboring jurisdictions' transit systems.

Having multimodal options between neighborhoods, Activity Centers, and open space is important in achieving the vision for Imagine Buckeye 2040. The TMP identifies opportunities to expand upon the existing transit, pedestrian, and bicycle linkages between these destination locations.

Maintaining Transportation Infrastructure

The Buckeye MPA covers a vast area and will therefore include a vast network of roadways, transit facilities, bicycle facilities, and pedestrian facilities. Although substantial portions of the City's future transportation network are driven by development, once the network is built, the City will be responsible to operate and maintain this network. Maintaining roadways and drainage systems is a significant cost for all municipal governments. Commonly referred to as operations and maintenance (O&M), planning for long-term maintenance of the transportation system is critical in ensuring the system is sustainable over time. The preservation of rights-of-way for regional and local facilities is an important step to be addressed in this planning process. With an ever-expanding roadway network, the funding for operations and maintenance will be a growing concern and should be a priority in the budget process for every fiscal year. Potential funding sources for O&M were identified for the different modes of transportation in this TMP.

Please see the next page.

2.1 Introduction

The street plan in Buckeye focuses on a comprehensive network that facilitates multimodal mobility and connectivity throughout the City. It considers the safety of commuters and balances it with congestion of the network. Planning for all components of the street network can create positive impacts to the overall quality of life in the community.

The Street Chapter identifies methods for improving mobility and reducing congestion on roadways throughout Buckeye to provide efficient local circulation and regional connectivity. This will also support increased travel demand that will occur with the projected growth at build out. This chapter addresses the existing conditions of the street network and establishes strategies to improve mobility on streets, while simultaneously considering safety. The Street Chapter is made up of eleven sections:

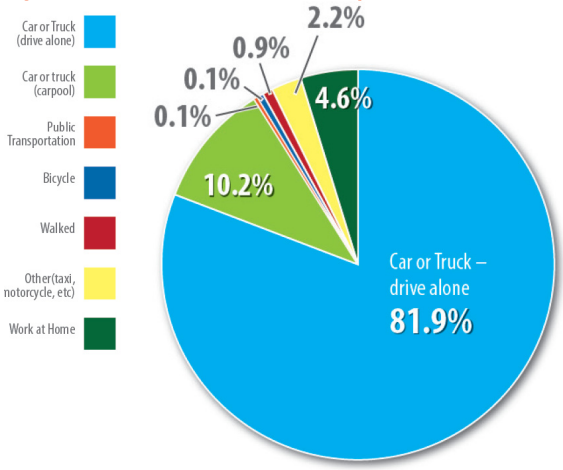
- Section 2.1 **Introduction.** Description of the Street Chapter purpose and contents.
- Section 2.2 **Existing Street Network.** Street-related infrastructure and street network that currently exist in the City of Buckeye.
- Section 2.3 **Imagine Buckeye 2040 General Plan.** Street and related Land Use Goals and Policies from the Imagine Buckeye 2040 General Plan.

- Section 2.4 **Multimodal Integration.** The framework for the street network to serve multiple users: personal vehicles, bicyclists, pedestrians, transit vehicles, freight, rail, and aviation.
- Section 2.5 **Relevant Street Plans.** Relevant previous plans and studies that support the recommendations of the Street Chapter.
- Section 2.6 **Street Design.** The types and design of roadways found in Buckeye.
- Section 2.7 **Street Network Connectivity and Multimodal Accommodation.** How the street network connects to neighborhoods and impact other modes of transportation.
- Section 2.8 **Travel Demand Modeling.** The travel demand modeling process and its outcomes.
- Section 2.9 **Street Recommendations.** Recommendations for the future street network.
- Section 2.10 **Street Implementation and Funding.** Process of implementation and the potential funding sources to assist in the Street Chapter implementation.
- Section 2.11 **Summary.** Summary of the Street Chapter.

2.2 Existing Street Network

Understanding the existing street network and how it functions is important for planning future transportation in Buckeye. At present, the most prominent mode of transportation is the car, as shown on **Figure 2-1**. Currently, there are 827 miles of roadways in Buckeye, and while there are areas where roads are not maintained by the City of Buckeye, it is important to factor such roadways into the existing analysis as these too contribute to mobility. This section provides an overview of several factors related to the street network, including street configuration, street classifications, jurisdictional responsibility, and crash data assessments. **Table 2-1** provides a summary of the existing major components of the street network (freeway, arterial, major collector), which is further described in this section.

Figure 2-1: Modes of Transportation

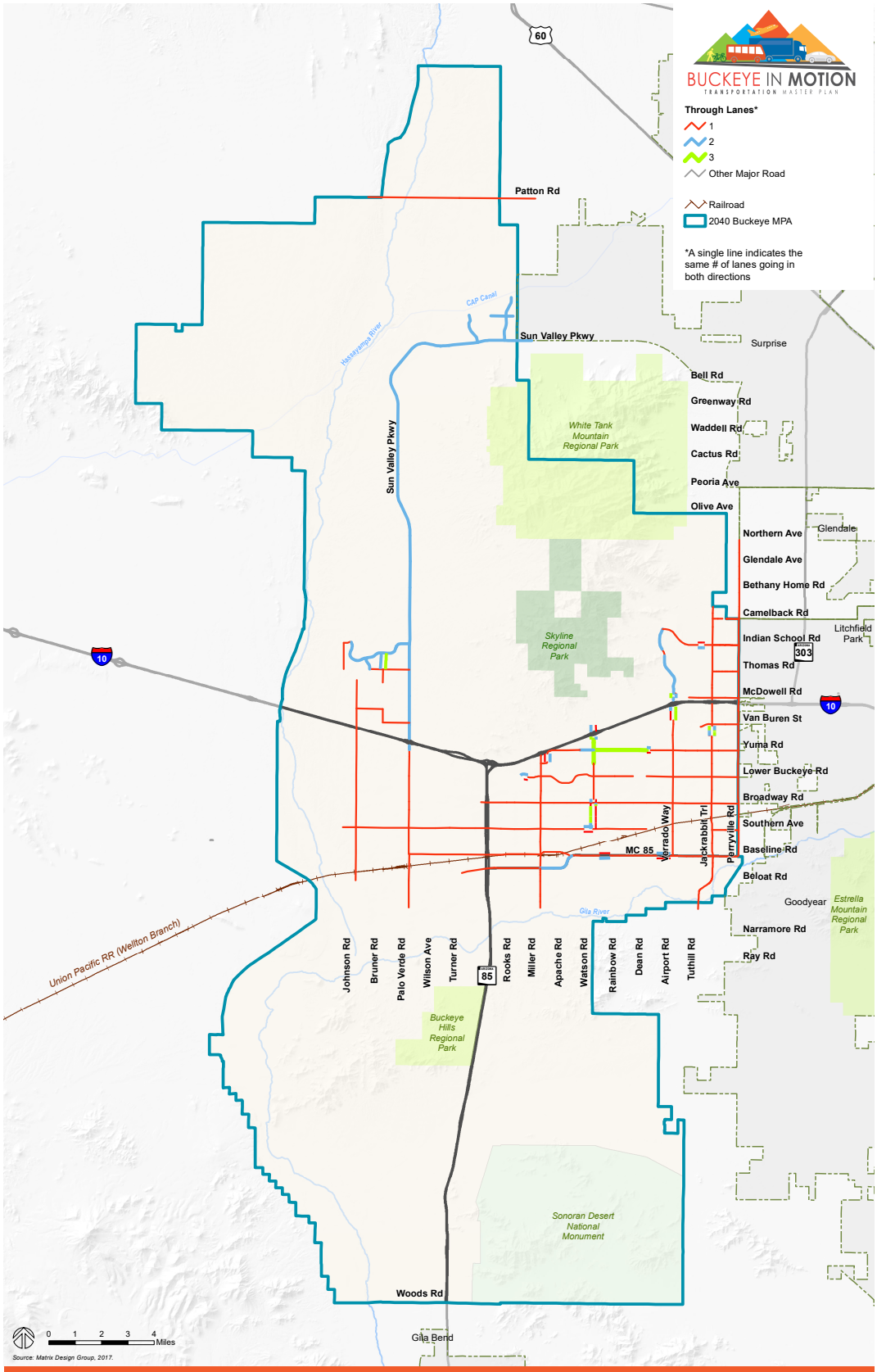


Source: U.S. Census Bureau American Community Survey 2011-2015.

Existing Street Configuration

Street configuration includes the number of lanes in each direction that each street has. **Figure 2-2** shows how existing roadways are configured throughout the Buckeye Municipal Planning Area (MPA) and **Table 2-1** summarizes the configuration for paved roads. Overall, the current network lacks connectivity and capacity in many areas, most prominently in the area confined by I-10, MC 85, SR 85, and Perryville Road. East-west connectivity north of I-10 is currently limited due to a lack of development; connectivity is expected to improve as new development becomes established north of I-10.

South of I-10, there are a limited number of roads presently exist that are continuous from the eastern to western boundary or north to south from I-10 to the Gila River. Currently, there are no arterials that provide a complete east-west connectivity, with the exception of Baseline Road, which turns into MC 85 at Apache Road. Arterials that provide existing connectivity from the Gila River area to I-10 include Palo Verde Road, Miller Road, Verrado Way, Jackrabbit Trail, and Perryville Road. At present, Jackrabbit Trail is the only arterial that crosses the Gila River. The most continuous roadway within the MPA south of I-10 is SR 85, which provides a north-south existing connection from I-10 to Gila Bend.



Matrix DESIGN GROUP

Figure 2-2
Existing Lane Configuration

Table 2-1: Existing Street Network

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
East-West Roadways						
Baseline Road	331st Avenue	Rooks Road	1	MCDOT	Major Collector	Arterial
Baseline Road	Rooks Road	Central Boulevard	1	City of Buckeye	Minor Arterial	Collector / Frontage Road
Baseline Road	Central Boulevard	MC 85	1	MCDOT	Minor Arterial	Collector / Arterial
Beardsley Parkway	Desert Oasis Boulevard	Canyon Springs Parkway	2	City of Buckeye	DNE	DNE
Beloat Road	Rooks Road	Apache Road	1	DNE	DNE	DNE
Beloat Road	Apache Road	Jack-rabbit Trail	1	DNE	DNE	Principal Arterial
Broadway Road	SR 85	Unnamed Road	1	MCDOT	Minor Arterial	Arterial
Broadway Road	Unnamed Road	Rainbow Road	1	City of Buckeye	Minor Arterial	Arterial
Broadway Road	Rain-bow Road	Perryville Road	1	MCDOT	Minor Arterial	Arterial
Camelback Road	Jackrabbit Trail	Beardsley Canal Road	1	MCDOT	DNE	Arterial
Camelback Road	Beardsley Canal Road	Perryville Road	1	MCDOT	Major Collector	Arterial
Gas Pipeline Road	Unnamed Road	SR 85	DNE	DNE	DNE	DNE
Hazen Road	Wilson Avenue	Miller Road	1	DNE	DNE	DNE
I-10	307th Avenue	Perryville Road	4	ADOT	Interstate	Freeway
Indian School Road	Johnson Road	Tartesso Parkway	1	City of Buckeye	DNE	DNE
Indian School Road	Verrado Way	Jackrabbit Trail	1	City of Buckeye	DNE	Arterial
Indian School Road	Jackrabbit Trail	Perryville Road	1	MCDOT	Minor Arterial	Principal Arterial
Lower Buckeye Road	Westpark Loop	Miller Road	2/1	City of Buckeye	Collector / Frontage Road	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Lower Buckeye Road	Miller Road	Rainbow Road	1	City of Buckeye	Collector / Frontage Road	Arterial
Lower Buckeye Road	Rainbow Road	Roosevelt District Canal	1	MCDOT	Collector / Frontage Road	Arterial
Lower Buckeye Road	Dean Road	Perryville Road	1	MCDOT	Collector / Frontage Road	Arterial
Lower River Road	Johnson Road	Palo Verde Road	DNE	DNE	DNE	Principal Arterial
MC 85	Turner Road	Miller Road	1	MCDOT	Principal Arterial	Arterial
MC 85	9th Street	Ash Avenue	2	City of Buckeye	Principal Arterial	Expressway
MC 85	Ash Avenue	Baseline Road	2	MCDOT	Principal Arterial	Expressway
MC 85	Baseline Road	Liberty School Road	1 /2	MCDOT	Principal Arterial	Expressway
MC 85	Liberty School Road	Perryville Road	1	MCDOT	Principal Arterial	Expressway
McDowell Road	Dean Road	Verrado Way	1	MCDOT	DNE	Arterial
McDowell Road	Verrado Way	Unnamed Road	1	City of Buckeye	DNE	Unpaved Road
McDowell Road	Unnamed Road	197th Avenue	1	MCDOT	Major Collector	Arterial
McDowell Road	197th Avenue	Jackrabbit Trail	1	Municipal	Major Collector	Arterial
McDowell Road	Jackrabbit Trail	191st Avenue	1	MCDOT	Major Collector	Arterial
McDowell Road	191st Avenue	Perryville Road	1	City of Buckeye	Major Collector	Arterial
Monroe Avenue	1st Street	9th Street	2	City of Buckeye	Principal Arterial	Expressway
Narramore Road	Bruner Road	Palo Verde Road	-	MCDOT	-	-
Old Highway 80	Salome Highway	SR 85	Other Major Road	MCDOT	Major Collector	Arterial
Patterson Road	Old Highway 80	Bruner Road	DNE	MCDOT	DNE	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Patterson Road	Bruner Road	SR 85	DNE	City of Buckeye	DNE	Arterial
Patton Road	299th Avenue	Douglas Ranch Road	1	MCDOT	DNE	Collector
Patton Road	Douglas Ranch Road	Unnamed Road	1	City of Buckeye	DNE	Collector
Patton Road	Unnamed Road	243rd Avenue	1	MCDOT	DNE	Collector
Southern Avenue	311th Avenue	SR 85 Road	1	MCDOT	Major Collector	Arterial
Southern Avenue	SR 85 Road	Unnamed Road	1	MCDOT	Major Collector	Arterial
Southern Avenue	Unnamed Road	Rainbow Road	1	City of Buckeye	Major Collector	Arterial
Southern Avenue	Rainbow Road	Dean Road	1	MCDOT	Major Collector	Arterial
Southern Avenue	Jackrabbit Trail	Perryville Road	1	MCDOT	Major Collector	Minor Arterial
Tartesso Parkway	Indian School Road	Sun Valley Parkway	2	City of Buckeye	DNE	Collector
Thomas Road	303rd Avenue	Sun Valley Parkway	1	City of Buckeye	DNE	DNE
Thomas Road	Verrado Way	Acacia Way	1	City of Buckeye	DNE	DNE
Thomas Road	Jackrabbit Trail	Perryville Road	1	MCDOT	Minor Arterial	Arterial
Tonopah-Salome Highway	334th Avenue	315th Avenue	DNE	MCDOT	Unpaved Road	Parkway
Tonopah-Salome Highway	315th Avenue	Hassayampa Drive	DNE	City of Buckeye	Unpaved Road	Parkway
Tonopah-Salome Highway	Hassayampa Drive	Johnson Road	DNE	MCDOT	Unpaved Road	Parkway
Tonopah-Salome Highway	Johnson Road	Sun Valley Parkway	DNE	City of Buckeye	Unpaved Road	Parkway
Van Buren Street	299th Avenue	Sun Valley Parkway	1	MCDOT	-	Arterial
Van Buren Street	Jackrabbit Trail	Perryville Road	1	MCDOT	Minor Arterial	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Woods Road	Old Highway 80	SR 85	DNE	MCDOT	DNE	Arterial
Yuma Road	Johnson Road	Palo Verde Road	DNE	DNE	DNE	DNE
Yuma Road	Miller Road	Dean Road	1/2/3	City of Buckeye	Minor Arterial	Arterial
Yuma Road	Dean Road	Verrado Way	1	MCDOT	Minor Arterial	Arterial
Yuma Road	Verrado Way	206th Avenue	1	City of Buckeye	Minor Arterial	Arterial
Yuma Road	206th Avenue	Tuthill Road	1	MCDOT	Minor Arterial	Arterial
Yuma Road	Tuthill Road	Roosevelt District Canal	1	City of Buckeye	Minor Arterial	Arterial
Yuma Road	Roosevelt District Canal	Perryville Road	1	MCDOT	Minor Arterial	Arterial
North-South Roadways						
299th Avenue	Roosevelt Road	Van Buren Street	1	MCDOT	DNE	DNE
303rd Avenue	Tartesso Parkway	Thomas Road	2	City of Buckeye	DNE	DNE
309th Avenue	Old Highway 80	Lower River Road	1	DNE	DNE	DNE
Apache Road	Yuma Road	Baseline Road	1	City of Buckeye	Minor Arterial	Arterial
Bruner Road	Tartesso Parkway	Thomas Road	2/3	City of Buckeye	DNE	DNE
Bruner Road	Thomas Road	Unnamed dirt road	1	City of Buckeye	DNE	DNE
Bruner Road	Lower River Road	Narramore Road	1	MCDOT	DNE	Arterial
Canyon Springs Boulevard	Tina Lane	Sun Valley Parkway	2	City of Buckeye	DNE	Arterial
Dean Road	Yuma Road	Roosevelt Irrigation District Canal Service Road	DNE	City of Buckeye	Minor Arterial	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Dean Road	Roosevelt Irrigation District Canal Service Road	Beloat Road	DNE	MCDOT	Minor Arterial	Arterial
Desert Oasis Boulevard	Sun Valley Parkway	Beardsley Parkway	2	City of Buckeye	DNE	Arterial
Jackrabbit Trail	Missouri Avenue	Indian School Road	1	MCDOT	Major Collector	Arterial
Jackrabbit Trail	Indian School Road	Van Buren Street	1	MCDOT	Minor Arterial	Arterial
Jackrabbit Trail	Van Buren Street	Roosevelt Irrigation District Canal Service Road	1	City of Buckeye	Minor Arterial	Arterial
Jackrabbit Trail	Roosevelt Irrigation District Canal Service Road	Elliot Road	1	MCDOT	Minor Arterial	Arterial
Johnson Road	Indian School Road	Thomas Road	1	City of Buckeye	-	-
Johnson Road	Tonopah Salome Highway	Yuma Road	1	MCDOT	Principal Arterial	Arterial
Johnson Road	Yuma Road	Pima Street	1	City of Buckeye	-	Arterial
Johnson Road	Pima Street	Lower River Road	1	MCDOT	-	Arterial
Miller Road	I-10	Hazen Road	1	City of Buckeye	Minor Arterial	Arterial
Old Highway 80	MPA Boundary	Woods Road	1	MCDOT	Major Collector	Arterial
Palo Verde Road	I-10	Buckeye Road	2	MCDOT	-	Arterial
Palo Verde Road	Buckeye Road	Yuma Road	1	City of Buckeye	-	Arterial
Palo Verde Road	Yuma Road	Narramore Road	1	MCDOT	-	Arterial
Perryville Road	Northern Avenue	Glendale Avenue	1	MCDOT	Minor Arterial	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Perryville Road	Lower Buckeye Road	Broadway Road	1	City of Buckeye	Minor Arterial	Arterial
Perryville Road	Montebello Avenue	Lower Buckeye Road	1	MCDOT		
Perryville Road	Broadway Road	Southern Avenue	1	MCDOT	Minor Arterial	Arterial
Perryville Road	Southern Avenue	MC 85	1	-	-	-
Rainbow Road	Yuma Road	Southern Avenue	-	City of Buckeye	Minor Arterial	Arterial
Rainbow Road	Southern Avenue	Beloat Road	1	MCDOT	Minor Arterial	Arterial
Rooks Road	Roosevelt Irrigation District Canal Service Road	Baseline Road	-	City of Buckeye	Minor Arterial	Arterial
Rooks Road	MC 85	Beloat Road	1	City of Buckeye		
Rooks Road	Beloat Road	Hazen Road	-	MCDOT	Minor Arterial	Arterial
SR 85	I-10	Woods Road	2	ADOT	Minor Arterial	Expressway
Sun Valley Parkway	243rd Avenue	I-10	2	MCDOT	Major Collector	Arterial
Turner Road	MC 85	Hazen Road	-	City of Buckeye	-	Arterial
Turner Road	Southern Avenue	MC 85	-	MCDOT	-	Arterial
Tuthill Road	Lower River Road	Elliott Road	1	MCDOT	-	-
Tuthill Road	MC 85	Beloat Road	1	MCDOT	-	-
Verrado Way	West Victory Boulevard	Sunrise Lane	2	City of Buckeye	-	Arterial
Verrado Way	Sunrise Lane	Lost Creek Drive	1	City of Buckeye	Minor Arterial	Arterial
Verrado Way	Lost Creek Drive	I-10	2	City of Buckeye	-	Arterial
Verrado Way	I-10	Fillmore Street	1/2/3	City of Buckeye	-	Arterial

Table 2-1: Existing Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Verrado Way	Fillmore Street	Yuma Road	1	City of Buckeye	-	Arterial
Verrado Way	Yuma Road	Beloat Road	1	MCDOT	Minor Arterial	Arterial
Watson Road	Woodlands Avenue	Adams Street	-	City of Buckeye	Major Collector	Arterial
Watson Road	Adams Street	I-10	3/1	MCDOT	Major Collector	Arterial
Watson Road	I-10	Durango Street	3	City of Buckeye	Minor Arterial	Arterial
Watson Road	Durango Street	Southern Avenue	1	City of Buckeye	Minor Arterial	Arterial
Watson Road	Buckeye Canal Road	Beloat Road	1	City of Buckeye	Major Collector	Collector
Wickenburg Road	MPA Boundary	Unnamed dirt road	1	City of Buckeye	Major Collector	Arterial
Wilson Road	Southern Avenue	Baseline Road	-	City of Buckeye	-	Arterial
Wilson Road	Baseline Road	Unnamed Road	1	City of Buckeye	-	Arterial
Wilson Road	Unnamed Road	Old Highway 80	1	MCDOT	-	Arterial

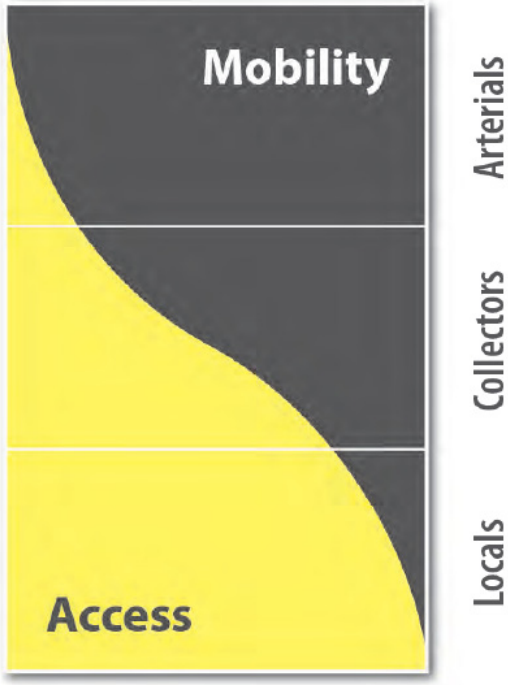
Due to the City's expansive land area, the portion of the MPA north of I-10 is currently sparsely populated, resulting in a limited number of roadways. The most continuous roadway within the MPA north of I-10 is Sun Valley Parkway, which is the continuation of Palo Verde Road, located south of I-10. Sun Valley Parkway provides two lanes in each direction from I-10 to the City of Surprise boundary. Other Arterial roadways include Canyon Springs Boulevard, Desert Oasis Boulevard, Beardsley Parkway, Tartesso Parkway, 303rd Avenue, and Bruner Road within the Tartesso CMP. These arterials are specific to CMPs and provide more than one lane in each direction; however, they only provide connectivity from the development to Sun Valley Parkway as no other developments have begun construction.

Additionally, Verrado Way within the Verrado Community Master Plan (CMP) mostly provides two-lanes in each direction from the southern to the northern boundary of the CMP, except at a short segment of Verrado Way between Lost Creek Drive on the south and Sunrise Lane on the north where only one-lane in each direction is provided. Other existing arterial roads north of I-10 include Jackrabbit Trail and Perryville Road. Both roads provide one-lane only in each direction.

Existing Street Classifications

Street classifications indicate the function of mobility and access on a roadway. Mobility is the movement from place to place while access is the ingress and egress to adjacent land. As illustrated in **Figure 2-3**, streets with more frequent access points (i.e. Local streets) have lower mobility than streets with less access points (i.e. Arterial streets). The theory behind the functional classification system is that streets are categorized based on where they fall within the spectrum of mobility to access. Arterial streets are designed to provide mobility and high speeds for longer trip distances; whereas, Local streets are designed for lower speeds and many access points.

Figure 2-3: Relationship Between Street Classification and Mobility

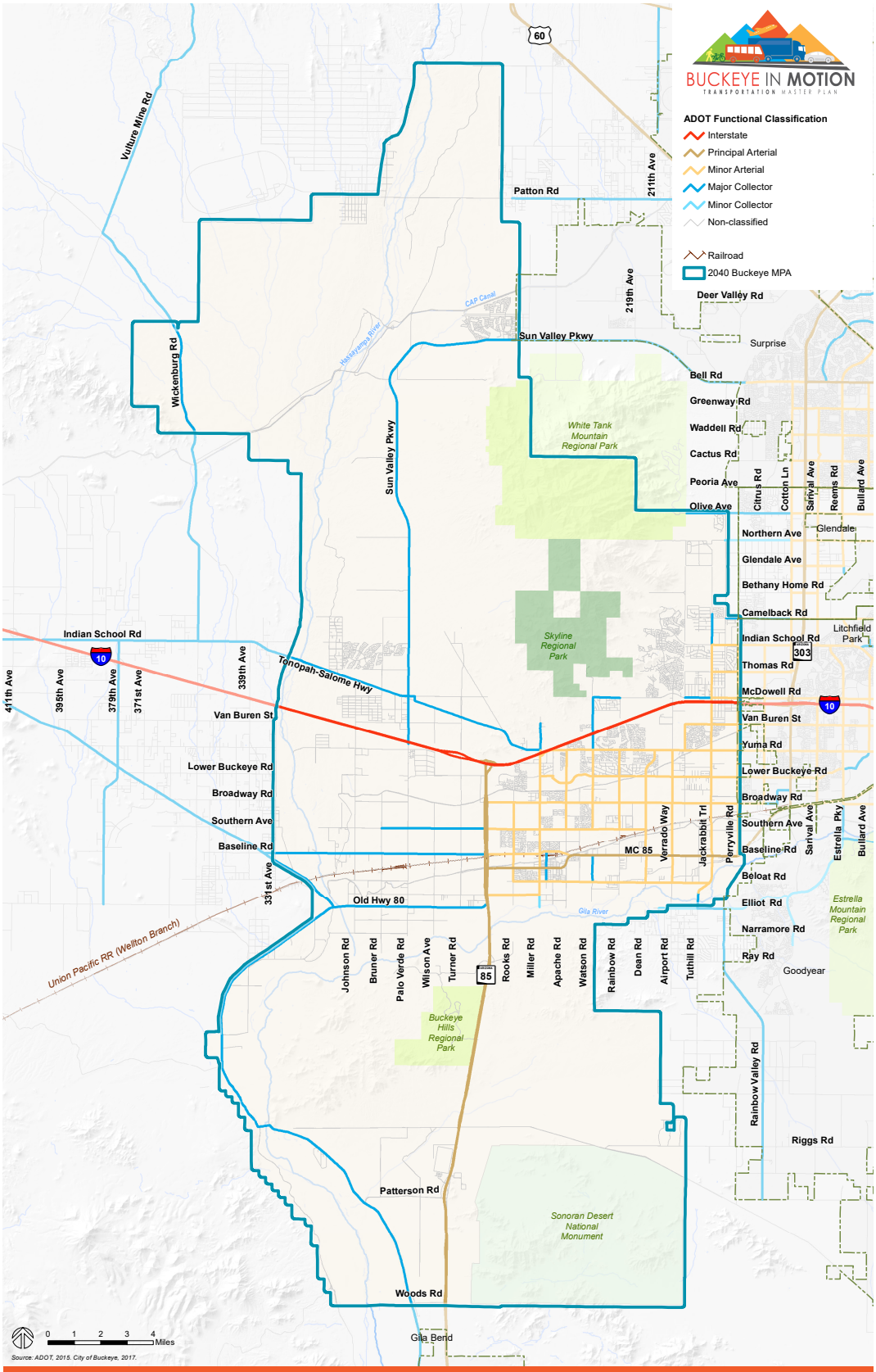


Between ADOT, MAG, MCDOT, and the City of Buckeye, each agency uses a different street classification system. The functional classification categories for ADOT are defined in the Federal Highway Administration (FHWA) *Highway Functional Classification Concepts, Criteria and Procedure*. MAG classifies all network roadways into a facility type for the purpose of travel demand modeling. Each of the MAG facility types relates to the operational capacity of the roadway design. **Table 2-2** shows how each of the street classifications compare between agencies as well as the lane configuration assumed in the travel demand modeling efforts for this Transportation Master Plan (the Hassayampa Valley Framework Study – Revised Network). **Figure 2-4** and **Figure 2-5** show the street classifications for ADOT and MAG respectively. The City's roadway classification is similar, but not the same as the ones outlined by ADOT or MAG.

Table 2-2: Street Classification Comparison

Revised Network Lane Configuration	City Classification*	MAG Facility Type	ADOT Functional Classification**
Freeway	-	Freeway/Expressway	Interstate/Other Freeway and Expressway/Urban Principal Arterial
Parkway	-	Major Arterial	Urban Principal Arterial
6-lane roadway	Major Arterial	Major Arterial	Urban Minor Arterial
4-lane roadway	Arterial	Major Arterial	Urban Minor Arterial
-	Major Collector	Collector	Urban Collector
-	Commercial Collector	Collector	Urban Collector
-	Collector	Collector	Urban Collector
-	Major Local	-	Urban Local Street
-	Local	-	Urban Local Street

*Source: *Engineering Design Standards, City of Buckeye, 2012; **Statewide Functional System – Current VS Proposed, ADOT, arcg.is/10CeDv, ADOT.*



Matrix DESIGN GROUP

Figure 2-4
ADOT Functional Classification

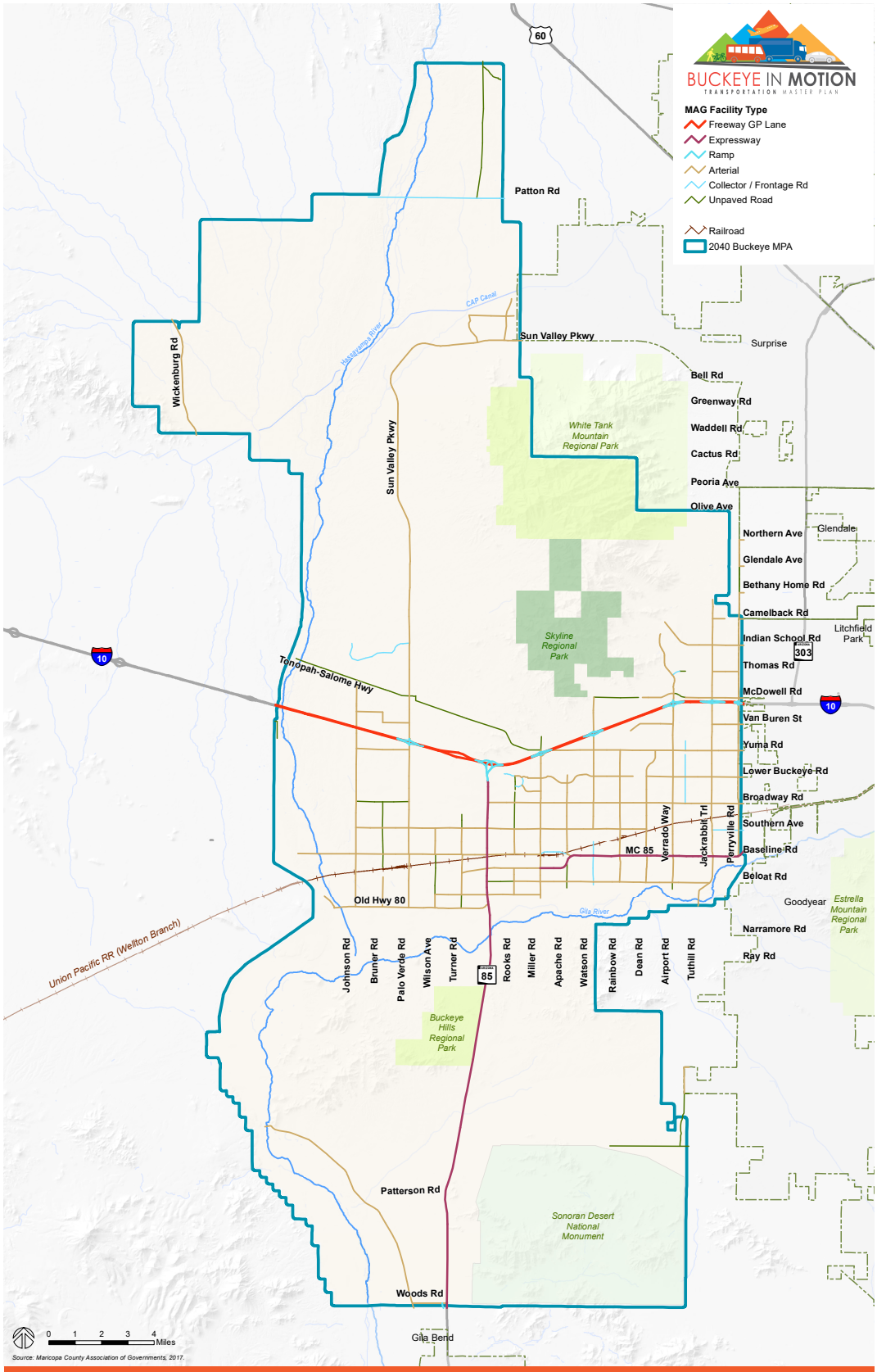


Figure 2-5
MAG Facility Type

Existing Jurisdictional Responsibility

Roadways within the Buckeye MPA are owned, operated, and maintained by various agencies, including the City of Buckeye, the Maricopa County Department of Transportation (MCDOT), and the Arizona Department of Transportation (ADOT). The jurisdictional responsibility for each roadway within the Buckeye MPA is displayed in **Figure 2-6**. Additionally, **Table 2-1** includes the jurisdictional responsibility for the roadways within the Buckeye MPA under the column "Jurisdictional Responsibility".

ADOT is responsible for all routes on the State Highway System (SHS) within the Buckeye MPA. The responsibility of all non-state roads within the city limits and MPA fall either to the City of Buckeye or to MCDOT. Each agency plans for roadway improvements – MCDOT does this through a Transportation Improvement Program, ADOT does this through their State Transportation Improvement Program, and the City does this through a Capital Improvement Program.

Jurisdictional responsibility is important to understand for implementing the Street recommendations in this TMP and for maintaining the future roadway system.

Existing Crash Data

The regional planning agency, MAG, provides information pertaining to crashes that have occurred over the last five years within the Buckeye City limits. Crash data was collected for the years 2012 through 2017 and assessed in this process. Crash density was determined through a cluster analysis, which grouped all crashes that occurred within 50 feet of another crash. Within the five-year period, a total of 3,372 crash incidences were recorded within the city limits. Over this five-year period an increase in population and traffic volumes has resulted in an increase in crashes. The crash data provided by MAG is limited to the existing City limits and does not include all crashes that have occurred within the larger MPA area.

This MAG data was queried to determine when several crashes have occurred at a location indicating numerous crashes along a corridor or at an intersection. All crash locations are shown on **Figure 2-7**, illustrating a concentration of crashes within the City limits, summarized into low-, medium-, and high-density crash locations. High-density and medium-density crash locations are listed in **Table 2-3**. The crash data provided by MAG was further examined to determine the level of severity for crashes. Crash severity is a critical factor in applying for Highway Safety Improvement Program (HSIP) funds used to improve roadway conditions that are the cause of crashes. Most of the 27 fatalities and 71 incapacitating injury crashes have occurred along I-10 and SR 85, as shown on **Figure 2-8**.

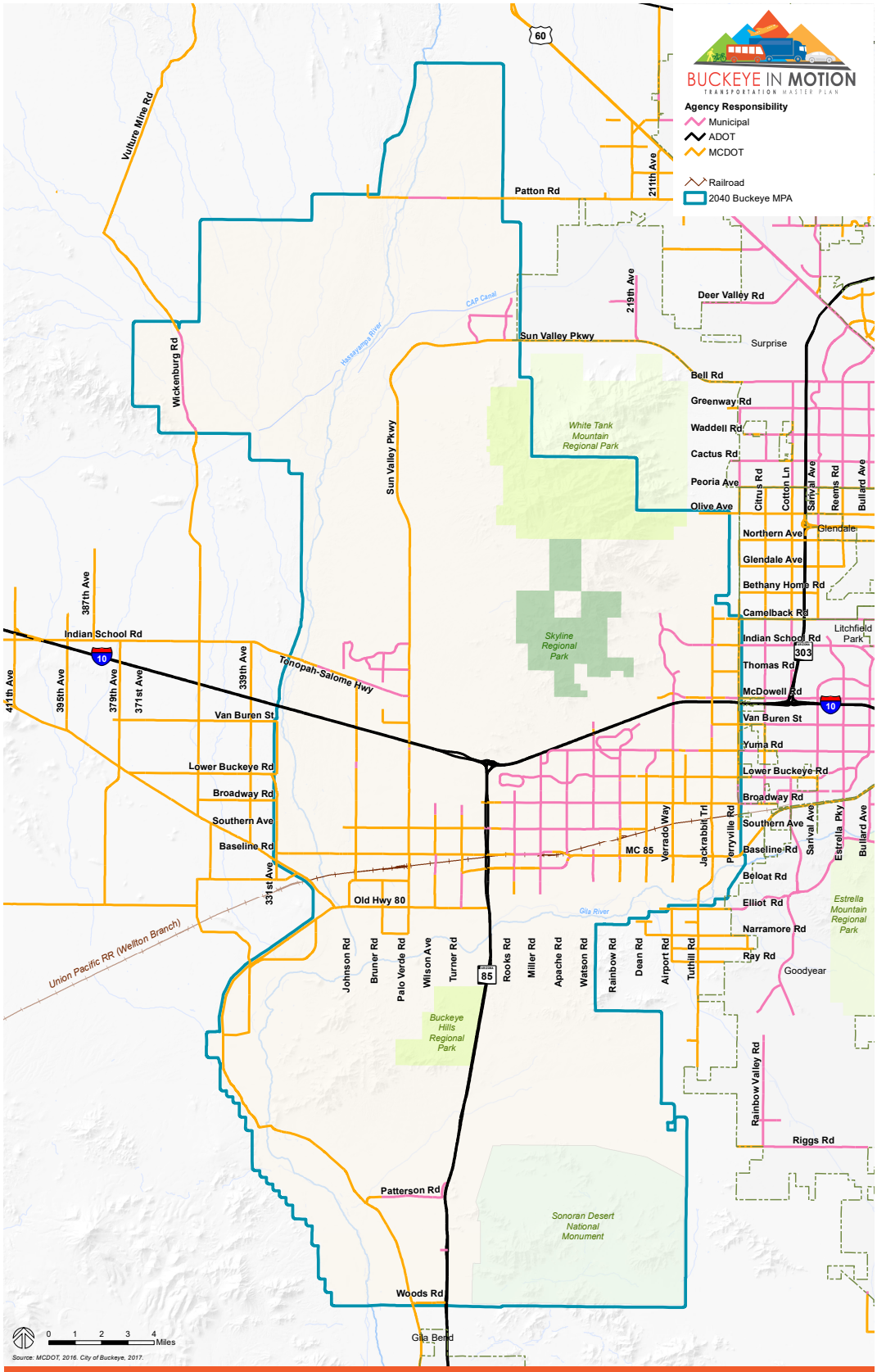


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Figure 2-6
Agency Responsibility

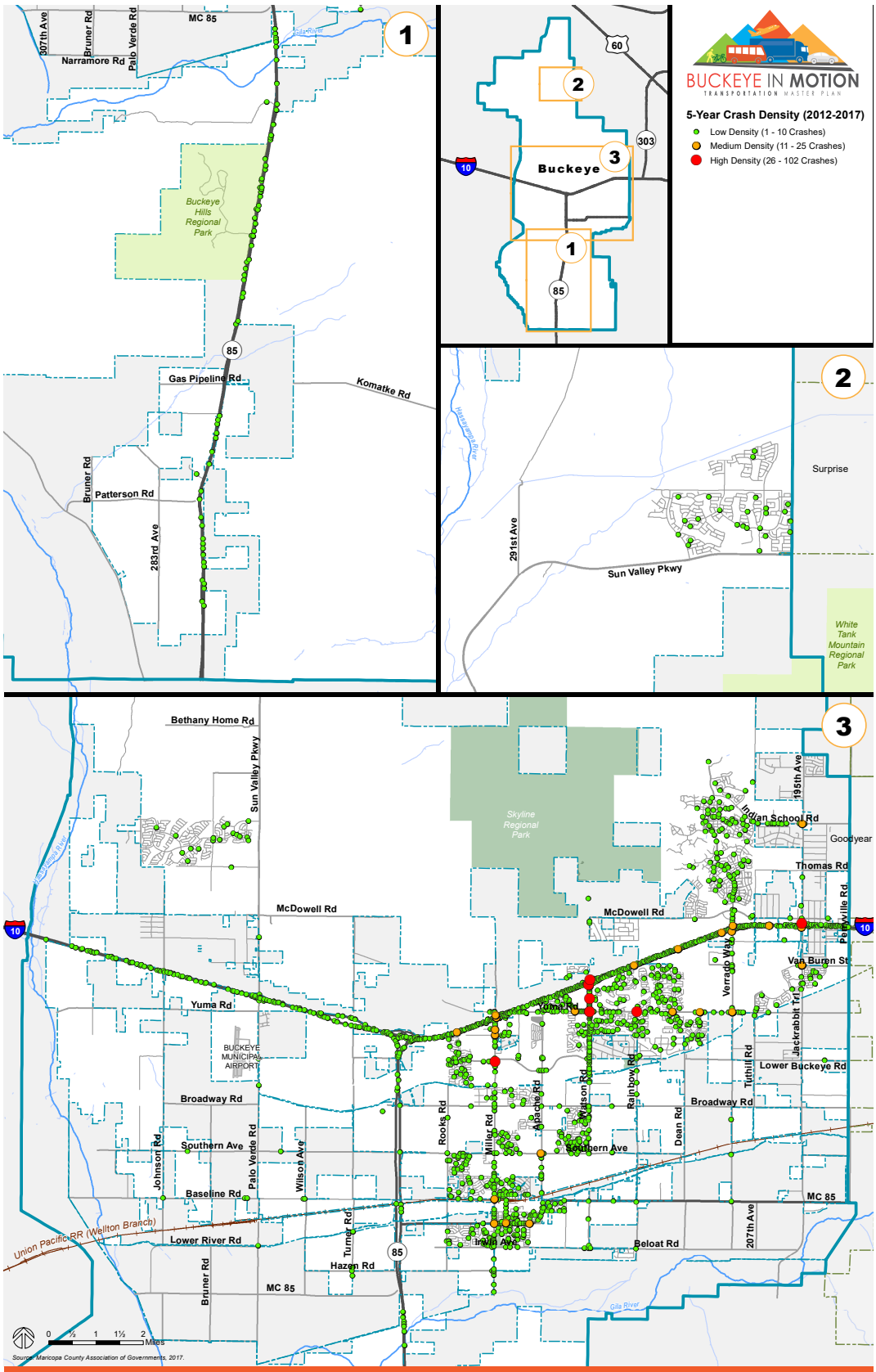


Figure 2-7
Crash Density

Table 2-3: High- and Medium-Density Crash Locations

High-Density Crash Locations	Number of Crashes
Watson Road and Yuma Road	102
Watson Road and Sundance Avenue	59
Jackrabbit Trail and I-10 north side	47
Watson Road and I-10 south side	46
Rainbow Road and Yuma Road	34
Watson Road and I-10 north side	28
Miller Road and Lower Buckeye Road	26
Medium-Density Crash Locations	**Number of Crashes**
Yuma Road and Verrado Way	22
Miller Road and I-10 north side	21
Miller Road and Pima Street	19
4th Street and Monroe Avenue	19
Yuma Road and Windmill Village Boulevard	18
Jackrabbit Trail and I-10 south side	18
I-10 at Rainbow Road	17
Miller Road and Durango Street	16
Yuma Road and Dean Road	16
Miller Road and MC 85	16
I-10 (north side) at Verrado Way	15
Apache Road and Southern Avenue	14
Miller Road and Baseline Road	14
Jackrabbit Trail and Van Buren Street	14
Miller Road and I-10 south side	13
9th Street and Monroe Avenue	12
I-10 (south side) at Verrado Way	12
Yuma Road and 237th Lane	12
I-10 at Dean Road alignment	11
I-10 at Verrado Way west side	11
I-10 and 200th Avenue alignment	11
I-10 and Rooks Road	11

Source: Maricopa Association of Governments, 2017.

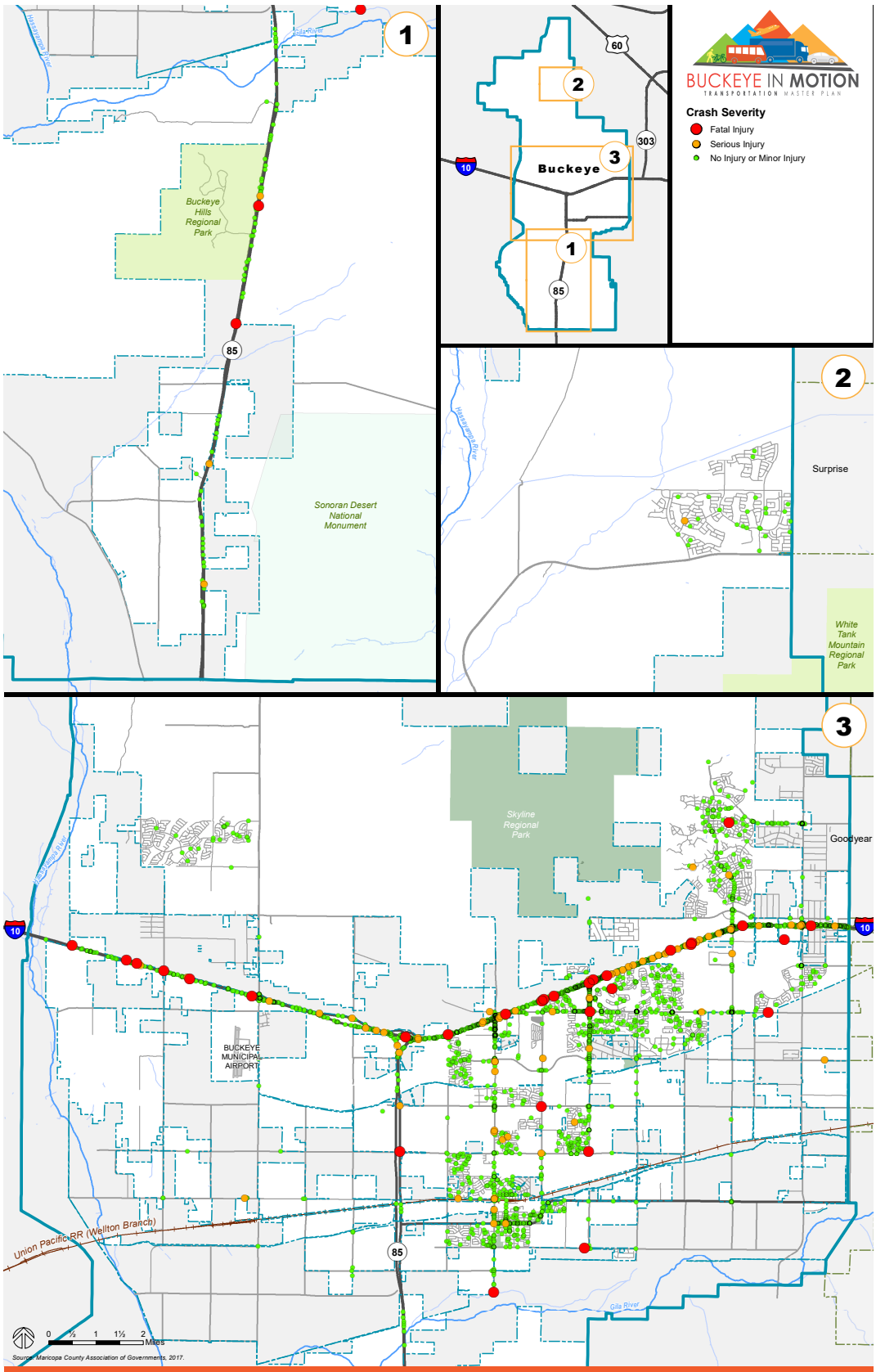


Figure 2-8
Fatal and Serious Injury Crash Locations

Crashes resulting in incapacitating injuries have occurred at 20 locations within Buckeye. Other than freeway locations, fatalities have occurred at eight (8) locations within Buckeye including:

- Jackrabbit Trail at Roosevelt Street
- Yuma Road at the canal crossing
- Watson Road at Yuma Road
- Watson Road at Southern Avenue
- Watson Road at Beloat Road
- Sundance Parkway and 231st Lane
- Broadway Road at Apache Road
- Miller Road at Elliot Road alignment

This crash data is important to understand and assessed to ensure that the future roadway network is designed and planned with safety considerations.

2.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan identified multiple policies applicable to the street network in the MPA. These street-related policies provide a foundation for planning the future street network. The policies state the importance of providing connectivity and that regional partnerships are necessary to accomplish the City's goals. The policies illustrate the importance of the street network to provide multimodal connectivity for multiple users including transit, pedestrians and bicyclists. Furthermore, the policies indicate the importance of highway and arterial connectivity to overall network functionality. Each of these points are carried throughout this Chapter and all chapters of the TMP.

The Imagine Buckeye 2040 General Plan identified the following street-related polices relative to the future street network to serve Buckeye as it grows.

- **Goal S-9** Buckeye is a connected community with an efficient multimodal transportation network.
- **Policy S-9.3** The City of Buckeye should ensure that the transportation network is managed, operated, and maintained efficiently.
- **Policy S-9.4** The City of Buckeye should design roads for multimodal accessibility, including transit, bicycles, and pedestrians.
- **Policy S-9.5** Collector streets should continue and connect master planned communities to provide alternative pedestrian, bike, and transportation routes without dependency on arterial network.
- **Policy S-9.7** The City of Buckeye will support expanding capacity on the existing I-10 and SR85.

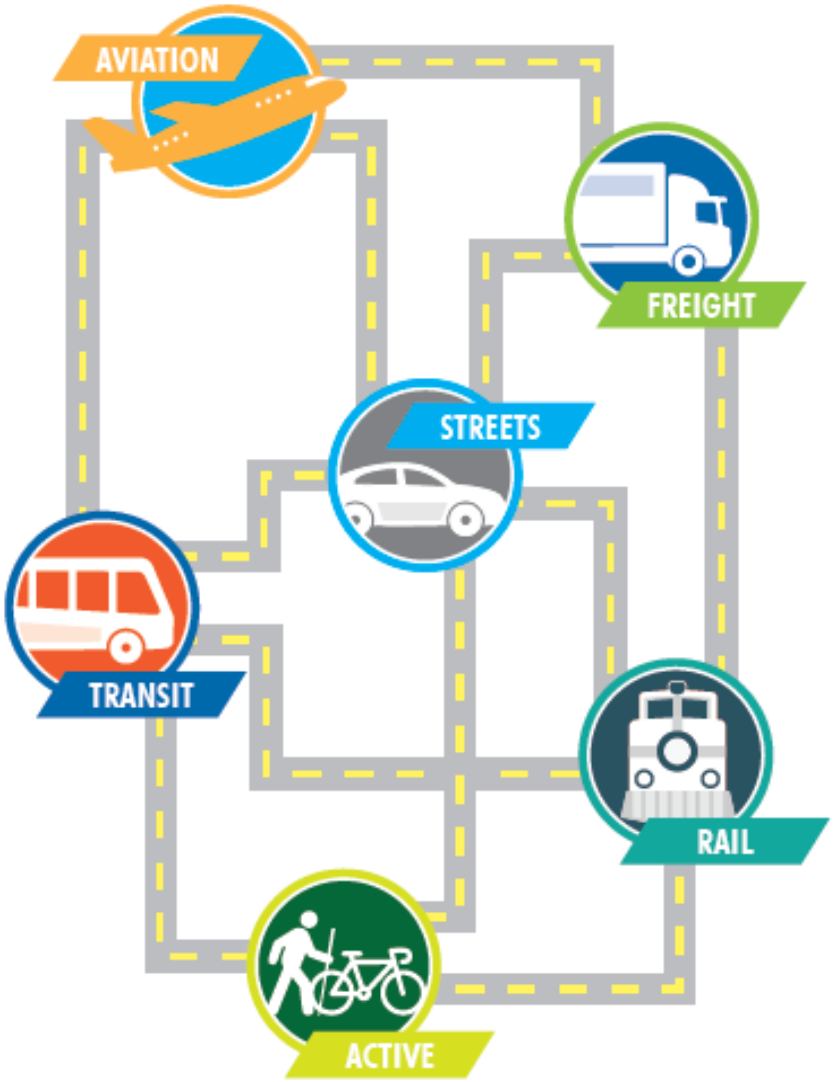
- **Policy S-9.8** The City of Buckeye will actively promote and lobby for the expansion and development of new key transportation facilities, including commuter rail and other regional transportation opportunities.
- **Goal S-10** Buckeye has a regional approach to transportation planning.
- **Policy S-10.1** The City of Buckeye will continue to use the adopted I-10/Hassayampa Valley Roadway Framework Study as the base for its future roadway network.
- **Policy S-10.2** The City of Buckeye will work to expand partnerships with ADOT, MCDOT, MAG, and adjacent municipalities when planning and funding transportation infrastructure.
- **Policy S-10.3** The City of Buckeye should regularly update transportation plans consistent with regional objectives.
- **Goal S-11** Buckeye has a roadway system that is safe and efficient.
- **Policy S-11.1** The City of Buckeye should plan for future transportation corridors by identifying and preserving adequate rights-of-way during the planning and development process.
- **Policy S-11.2** The City of Buckeye should update the Capital Improvement Plan with needed road improvements on an annual basis.
- **Policy S-11.3** The City of Buckeye should improve the flow of traffic by addressing missing links in the arterial network.
- **Policy S-11.4** The City of Buckeye should designate appropriate truck routes that provide efficient connections to industrial and commercial uses and do not adversely impact residential land uses.
- **Policy S-11.5** The City of Buckeye should continue to support the update and implementation of the Intelligent Transportation Systems (ITS) Master Plan.
- **Policy S-11.6** New development should provide connectivity to adjacent neighborhoods to minimize arterial dependency.
- **Goal S-12** Buckeye's multimodal system provides alternatives for modes of travel.
- **Policy S-12.6** The City of Buckeye should continue to promote methods of air pollution reduction related to transportation, such as the Travel Reduction Program.
- **Policy S-12.7** New development will plan, design and construct, where appropriate, roadways in conformance with [Imagine Buckeye General Plan] Figure 3-3, Future Transportation Network.

These policies provide broad guidance for street related recommendations in this TMP.

2.4 Multimodal Integration

An important concept for Buckeye's future transportation system is the mobility, connectivity, and proximity of multiple modes of transportation. Within the future transportation network, each of these transportation modes should complement one another in a safe and efficient manner. The Buckeye TMP is a multimodal plan consisting of a different chapter for each mode (or supporting component) of the full transportation network. These modes/components include: streets, transit, active transportation (pedestrian and bicycle), rail, freight, and Intelligent Transportation Systems (ITS). Figure 2-9 illustrates the integrated transportation system that the TMP is planning for.

Figure 2-9: Integrated Transportation System



Of all the modes, the street network is perhaps the most important component to building and maintaining a multimodal system. This is because the street network serves multiple purposes including the movement of personal vehicles, trucks, transit vehicles, bicyclists, and pedestrians as well as providing access to the airport or across railways. Furthermore, the City's ITS network will be a supporting component of the street network to ensure all of the modes interact in a safe and efficient manner. In addition to laying out the future street network, this chapter has been expanded to communicate the importance of establishing mode priorities on roadways and the importance of creating network redundancy with a connected local and collector roadway network.

2.5 Relevant Street Plans

The street network in Buckeye has been studied in numerous previous planning efforts, either as a direct focus of the planning effort or as a part of the regional effort. **Table 2-4** provides a list of the such plans and studies which were considered in the development of this plan. Included in this section is a more detail description of the most relevant plans to Buckeye's street network.

MCDOT Transportation System Plan 2035

The MCDOT Transportation System Plan (TSP) 2035 is the implementation component of the transportation element of the Maricopa County Comprehensive Plan, Vision 2030, and was adopted in 2017. The TSP plans for current transportation needs in a safe, efficient, and environmentally-compatible way that supports economic development throughout Maricopa County. Transportation systems assessed in the TSP include roadways, bicycle facilities, and the regional trail system.

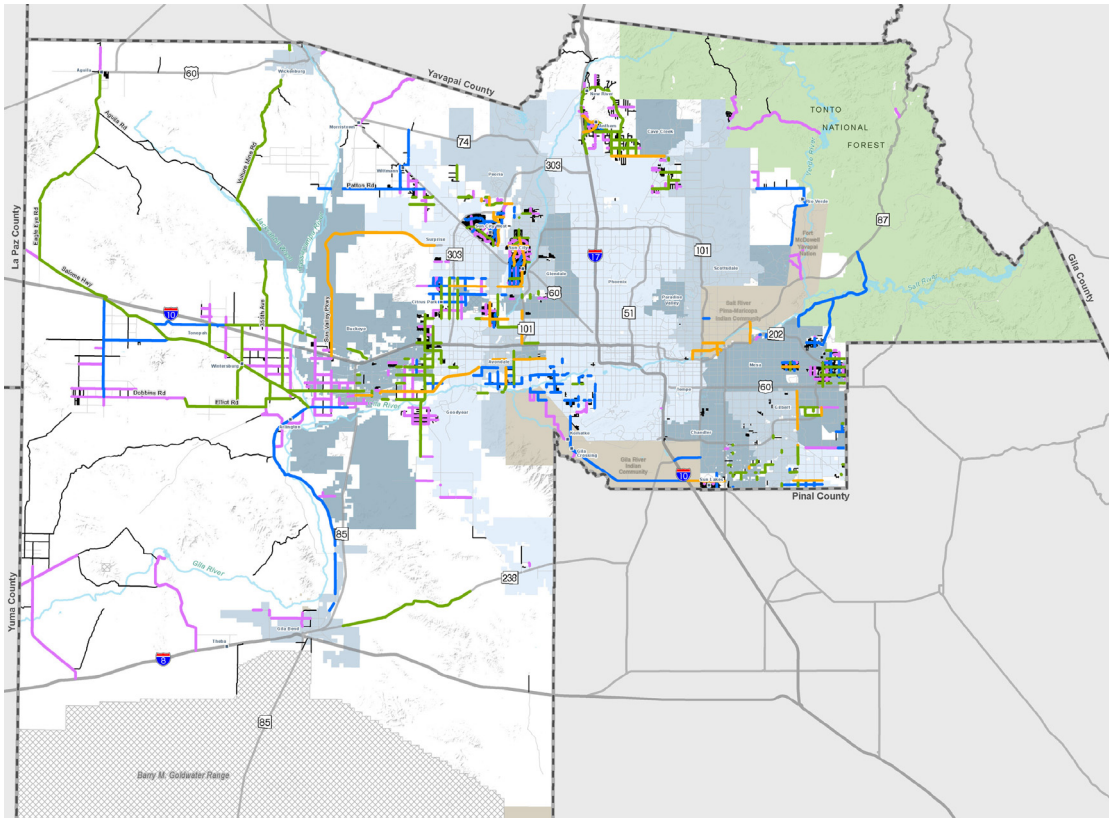
The TSP 2035 accounts for three planning horizons for the plan – 2020, 2025, and 2035 – and identifies goals, objectives, and strategies for transportation throughout the county and how each goal will be achieved. Additionally, the TSP includes maps, such as the Functional Classification of MCDOT Roadways map. This map shows principal arterials, minor arterials, major collectors, minor collectors, and local streets throughout the unincorporated county, including Sun Valley Parkway and MC 85, which were used as part of the framework for the TMP. The Functional Classification map from the TSP is shown on **Figure 2-10**. Much of the network shown in the TSP in Buckeye is located between I-10 and the Gila River.

Projects were identified through a needs analysis, which compared determined growth to service volume standards to determine roadways that exceed the Level of Service (LOS) standards. While the analysis indicates that most of the county roads in Buckeye currently meet the LOS standards, there are roads that are projected to exceed LOS standards by 2020.

Table 2-4: Related Plans and Studies

Publishing Agency	Title	Published Date
City of Buckeye	Buckeye Capital Improvement Program FY 11/12-FY 17/18	2012
Maricopa County DOT	Hidden Waters Parkway Corridor Feasibility Study (Watermelon Road to Interstate 10)	2010
	McDowell Parkway Corridor Feasibility Study (339th Avenue to Dean Road)	2010
	Turner Parkway Corridor Feasibility Study (Interstate 10 to State Route 74)	2010
	Major Streets and Routes Plan (MSRP)	Revised 2011
	Northern Parkway/Tonopah Parkway Corridor Feasibility Study	2011
	Deer Valley Parkway Feasibility Study (US 60 to Wild Rose Parkway)	2012
	Hidden Waters Parkway North Feasibility Study (Interstate 10 to State Route 74)	2012
	Community Master Plans (CMPs) Traffic Studies	Various
	Yuma Parkway Feasibility Study (Salome Highway to Palo Verde Road)	2012
	Wild Rose Parkway Feasibility Study (Sun Valley Parkway to US 60)	2013
	Camelback Parkway Feasibility Study (Sun Valley Parkway to Tonopah Parkway)	2013
	Dove Valley Parkway Feasibility Study (US 60 to Hidden Waters Parkway)	2013
	Greenway Parkway Feasibility Study (Turner Parkway to Hassayampa Freeway)	2014
	Wintersburg Parkway Feasibility Study (Salome Parkway to Turner Parkway)	2014
	Southern Parkway (Salome Highway to State Route 85) Feasibility Study	2014
	Transportation Improvement Program FY 2018-2022	2017
	Transportation System Plan (TSP) 2035	2017
Arizona DOT	Long-Range Transportation Plan 2010-2035	2011
	I-11 and Intermountain West Corridor Study – Corridor Justification Report	2014
	I-11 and Intermountain West Corridor Study – Corridor Concept Report	2014
	I-11 Tier 1 Environmental Impact Statement – Scoping Summary Report	2017
	I-11 Draft Tier 1 Environmental Impact Statement	2019
Maricopa Association of Governments	I-10/Hassayampa Valley Roadway Framework Study	2007
	Town of Buckeye I-10 Access Review and Evaluation	2008
	I-8/Hidden Valley Transportation Framework Study	2009
	I-10 (Papago Freeway)/Dean Road Interchange Feasibility Study	2014
	Transportation Improvement Program FY 2014-2018	2014
	2035 Regional Transportation Plan	2014
	Annual Report on the Status of the Implementation of Prop 400	2015
	Transportation Improvement Program FY 2018-2022	2017
	2040 Regional Transportation Plan	2017
	State Route 30/Tres Rios Freeway Scoping Study	-

Figure 2-10: Functional Classification of MCDOT Roadways from the MCDOT TSP 2035



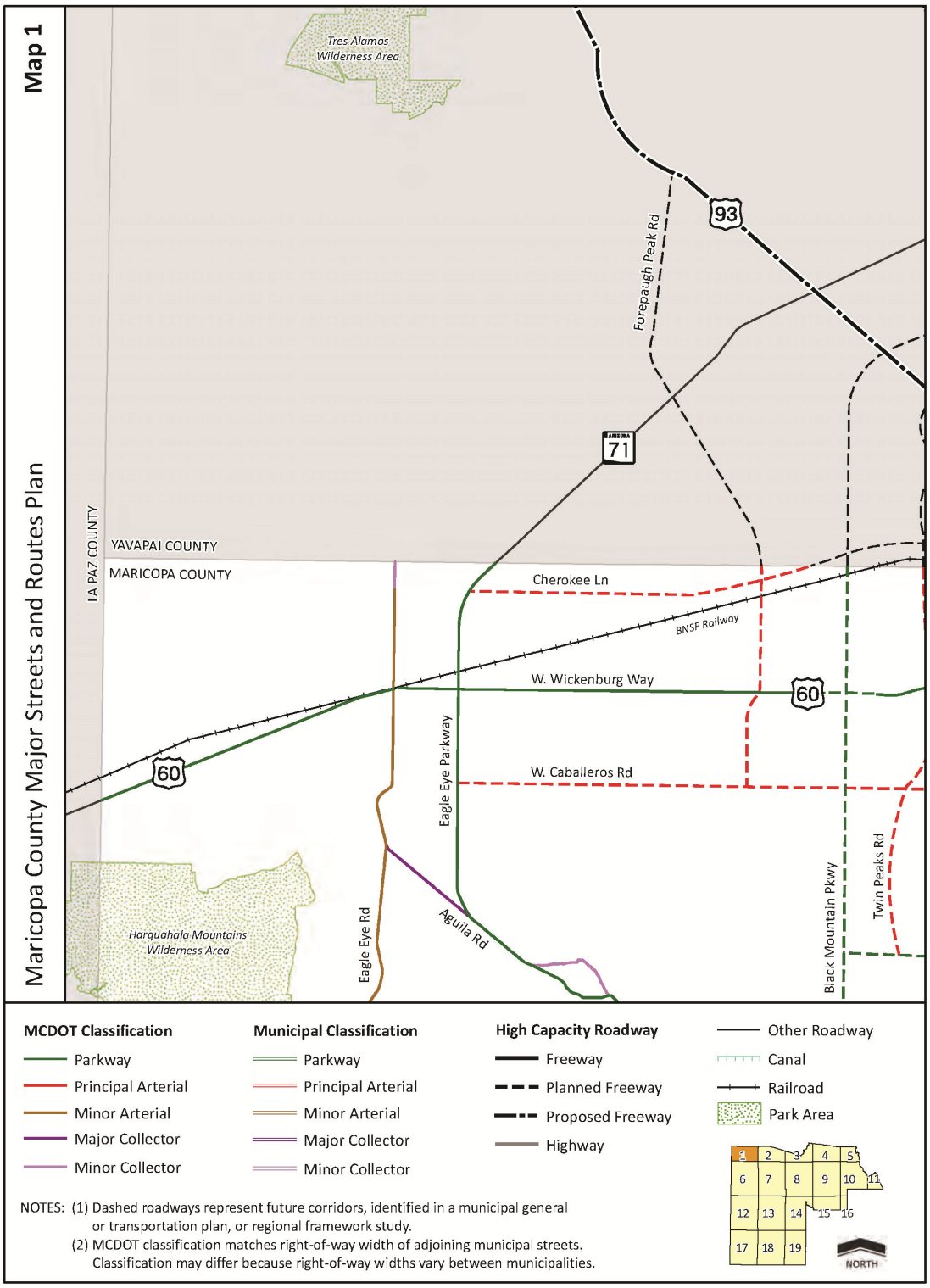
Source: MCDOT TSP, 2017.

MCDOT Major Streets and Routes Plan

The Major Streets and Routes Plan (MSRP) was adopted in 2001 and last revised in 2011 in response to the MCDOT TSP. The MSRP is used for planning future development along Maricopa County roads with consideration given to adequate visibility and access, protecting property values and neighborhood character, and enhancing unique County areas along Maricopa County roads. Additionally, the plan provides Parkway design standards, and identifies LOS thresholds. The MSRP does not control roadway specifications – this is done through the MCDOT Roadway Design Manual.

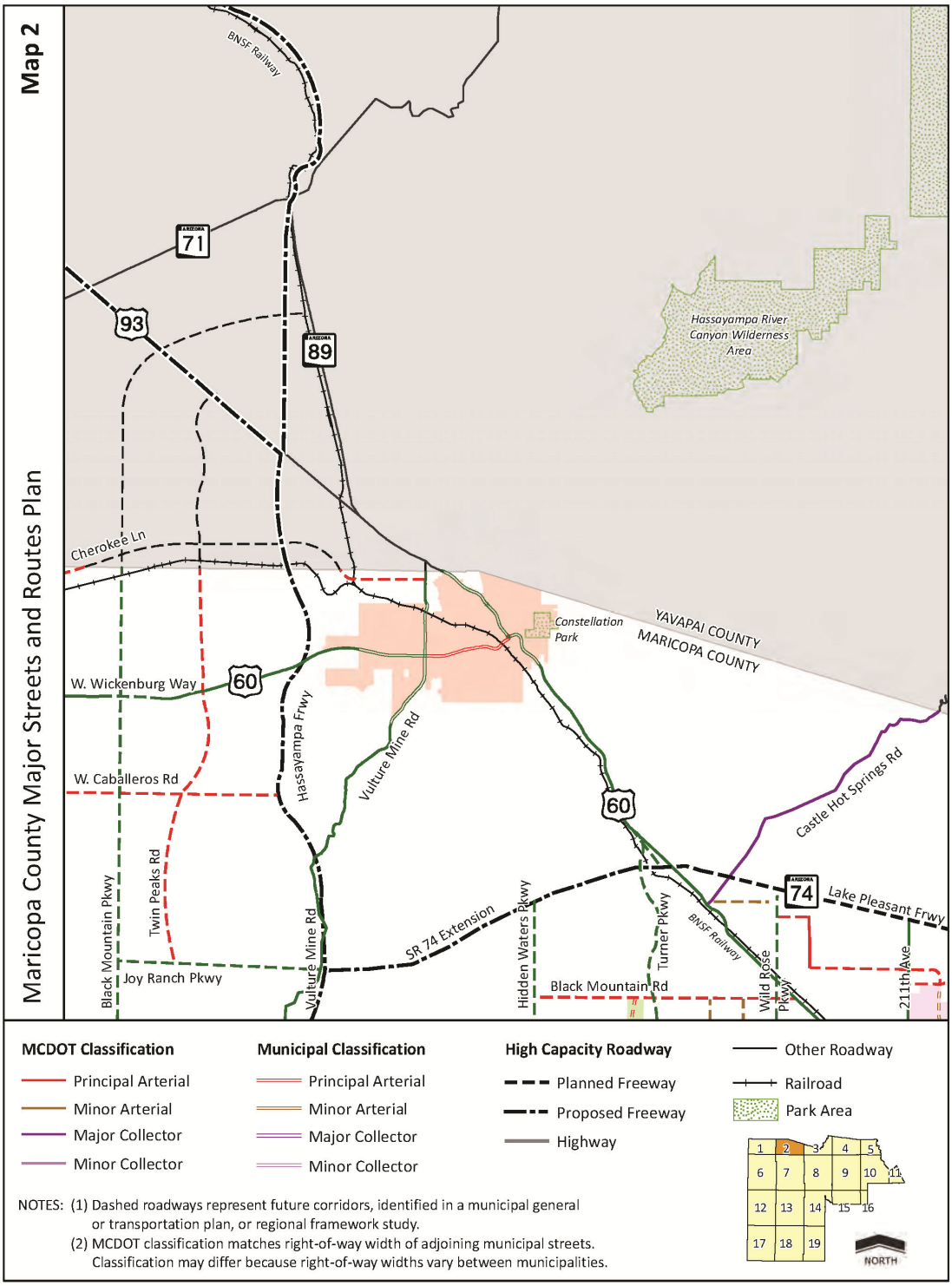
The maps in the MSRP were used as a framework for the TMP. These maps identify MCDOT classifications, municipal classification, and high capacity roadways. **Figure 2-11** shows the MSRP map identifying classifications in Buckeye from 411th Avenue to Airport Road and from MC 85 to Dove Valley Road. A subsequent map in the MSRP, **Figure 2-12**, maps the same classifications, but within a different boundary from Verrado Way to 27th Avenue and from Baseline Road to Dove Valley Road. An additional map, **Figure 2-13** shows the boundary from 411th Avenue to Verrado Way and from Powerline Road to Hazen Road and another, **Figure 2-14**, from Airport Road to 27th Avenue and from Barnes Road to Baseline Road.

Figure 2-11: MSRP Classifcations from 411th Avenue to Airport Road, MC 85 to Dove Valley Road



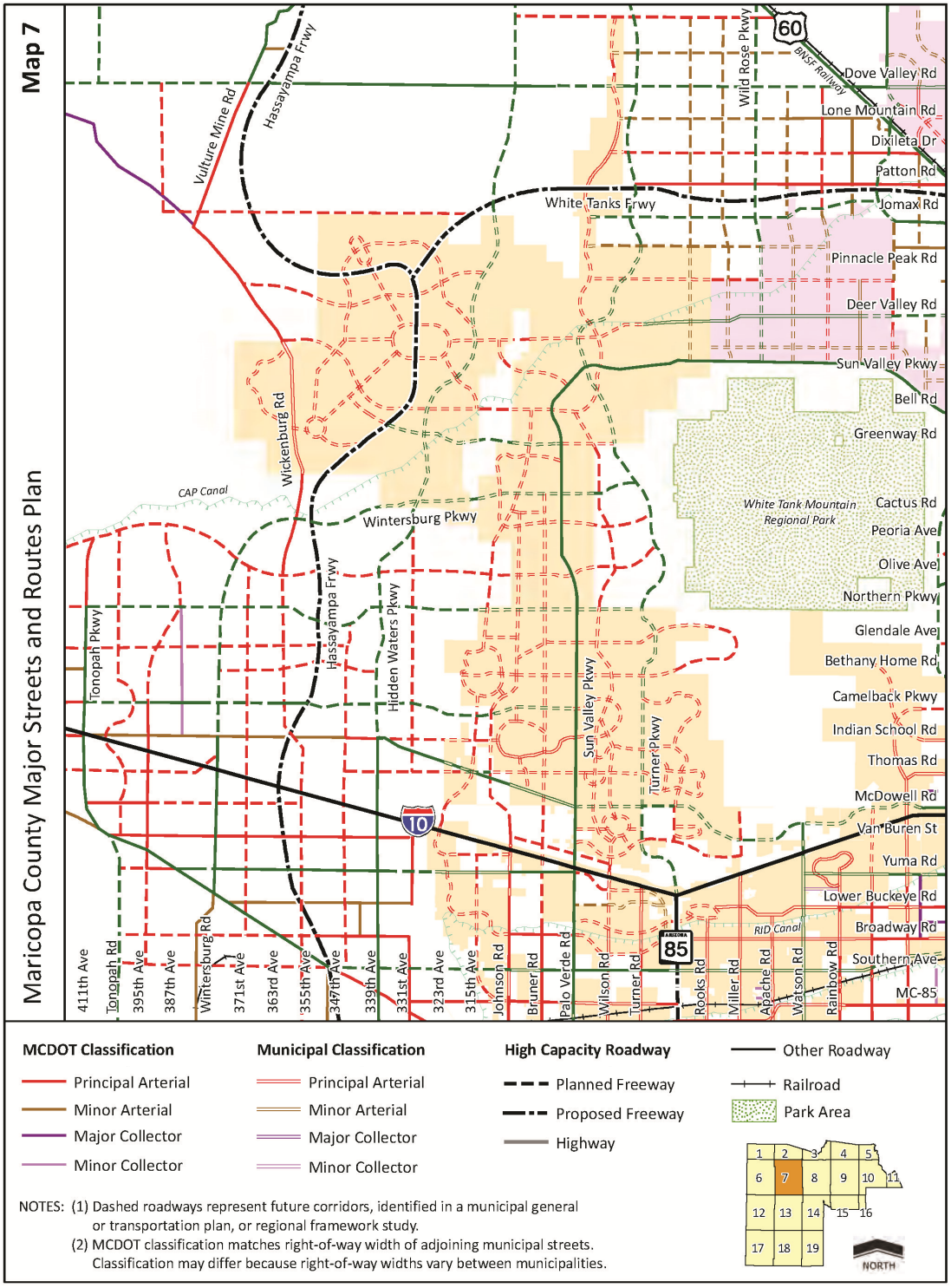
Source: MCDOT Major Streets and Routes Plan, 2011.

Figure 2-12: MSRP Classifcations from Airport Road to 27th Avenue, Baseline Road to Dove Valley Road



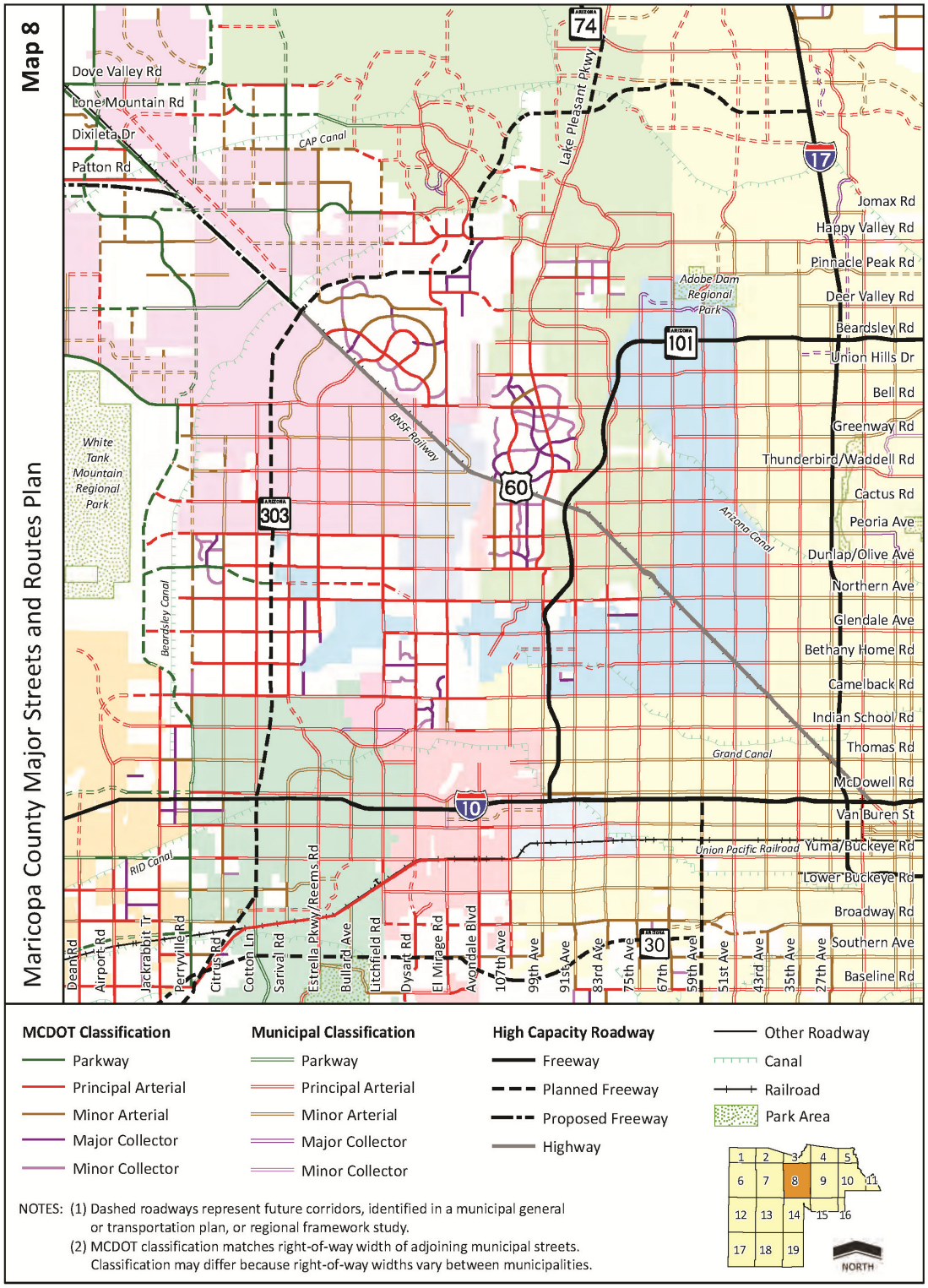
Source: MCDOT Major Streets and Routes Plan, 2011.

Figure 2-13: MSRP Classifcations from 411th Avenue to Airport Road, Powerline Road to Hazen Road



Source: MCDOT Major Streets and Routes Plan, 2011.

Figure 2-14: MSRP Classifcations from Airport Road to 27th Avenue, Schumacher Road to Broadway Road



Source: MCDOT Major Streets and Routes Plan, 2011.

MCDOT Transportation Improvement Program

The MCDOT TIP is a five-year financial planning tool for transportation system improvements throughout the County, last updated in 2017 for fiscal year (FY) 2018 – FY 2022. The plan identifies transportation system management projects, which, upon completion, will allow the transportation system to function more efficiently. The projects that fall within the Buckeye MPA include:

- MC 85 from Baseline Road to Liberty School – passing lanes, intersection improvements, signing and striping (2018)
- MC 85 from Jackrabbit Trail to Cotton Lane – passing lanes, intersection improvements, signing and striping (2018-2019)
- MC 85 at Verrado Way – signal installation (2018)
- MC 85 at Rainbow Road – signal installation (2018-2019)
- Yuma Road at Jackrabbit Trail – installation of traffic signal (2018)
- US 80 and Rainbow Wash – drainage improvement (2018)

ADOT Long-Range Transportation Plan

ADOT finalized the statewide Long-Range Transportation Plan (LRTP) in 2018. The LRTP is a capital programming guide for ADOT while also documenting statewide transportation investment needs through the year 2040. The purpose of the LRTP is to provide the state, municipal planning organizations, councils of government, and other partners with a description of the transportation needs, revenues available, investment priorities, and the anticipated performance of the transportation system.

The LRTP identifies how ADOT intends to allocate future funding resources by three different investment types: preservation, modernization, and expansion. Preservation investment is spending to maintain smooth pavement and bridges. Modernization is non-capacity spending for safety and operational improvements. Expansion is improvement that adds capacity to the state highway system through new roads and additional lanes to existing roads. **Figure 2-15** and **Figure 2-16** show how ADOT recommends future resources be allocated for the State (Recommended Invest Choice (RIC)) and the MAG region.

While these resources are recommended for the State and MAG, it should be noted that the transportation needs exceed the current available resources. Funding resources for State transportation investments comes from the State Highway User Revenue Fund (HURF), county transportation excise tax, and federal funding programs. As of the completion of the LRTP, it is estimated that ADOT has $22.8 billion available for highway capital spending; however, the total highway capital needs are estimated to be $53.5 billion. This results in a funding gap of over $30 billion.

Figure 2-15: Statewide Recommended Investment

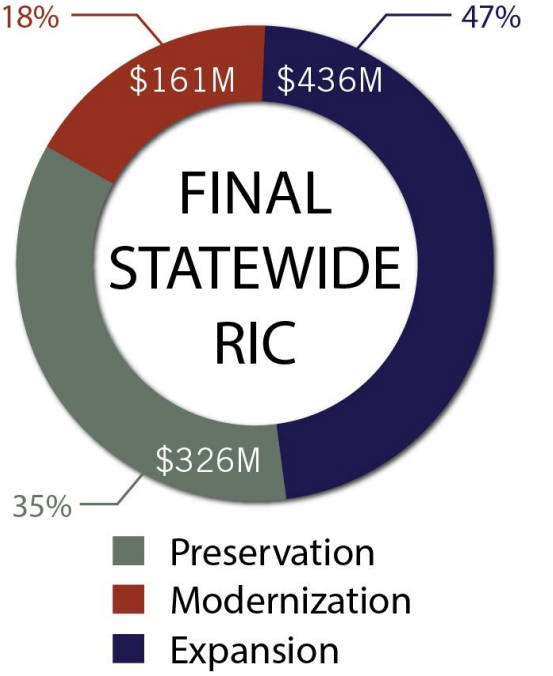
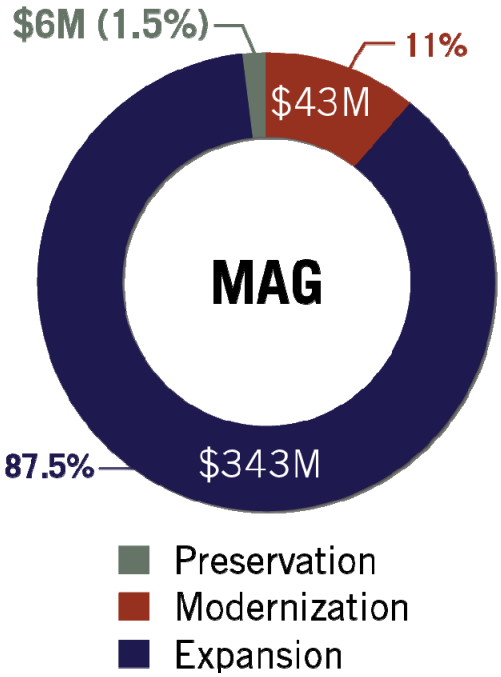


Figure 2-16: MAG Recommended Investment



Source: ADOT LRTP, 2018.

ADOT I-11 and Intermountain West Study

ADOT is the leading Arizona agency for the future I-11 corridor. The corridor is a proposed new interstate that would provide a link between the Phoenix metropolitan area and Las Vegas, Nevada. The ultimate vision is to provide a multi-modal interstate corridor serving the Inter-mountain West and extending from the US/Mexico border north to the US/Canada border. This route would provide freight linkages between new and expanding ports in Mexico and Canada, ports on the West Coast as well as future inland ports and would contribute to the distribution of goods across North America. In Arizona, the I-11 corridor is proposed to begin at the US/Mexico border in Nogales and head north to Wickenburg, bypassing the Phoenix metropolitan area to the west. I-11 would then follow the US 93 alignment from Wickenburg and proceed north to Las Vegas.

The I-11 and Intermountain West Study was completed in 2014 to determine if the I-11 and Intermountain West Corridor concept is justifiable and to establish likely routes for the corridor. The Study identifies project development next steps, including segments of I-10/I-8 in Casa Grande to I-10 in Buckeye and from I-10 in Buckeye to US 93 in Wickenburg.

ADOT I-11 Environmental Impact Statement

The next phase of the I-11 corridor after the Intermountain West Study, was the Environmental Impact Statement Study. A Tier 1 Environmental Impact Statement (EIS) was initiated by the Federal Highway Administration (FHWA) and ADOT for the I-11 alignment between Nogales and Wickenburg in 2016. The EIS is a part of the overall environmental review for the I-11 corridor and is in accordance with the National Environmental Policy Act (NEPA) as well as other requirements. The primary purpose of the Tier 1 EIS is to reach a consensus on a preferred alternative, which will include the defined corridor between Nogales and Wickenburg for a proposed transportation facility, type of transportation facility, footprint to accommodate the proposed transportation facility, and smaller, individual projects for future implementation. The selected corridor alternative will be 2,000-feet wide between Nogales and Wickenburg. The Tier 1 EIS process completed the Alternatives Selection Report in 2017, which developed, evaluated, and screened corridor options for the I-11 corridor from Nogales to Wickenburg.

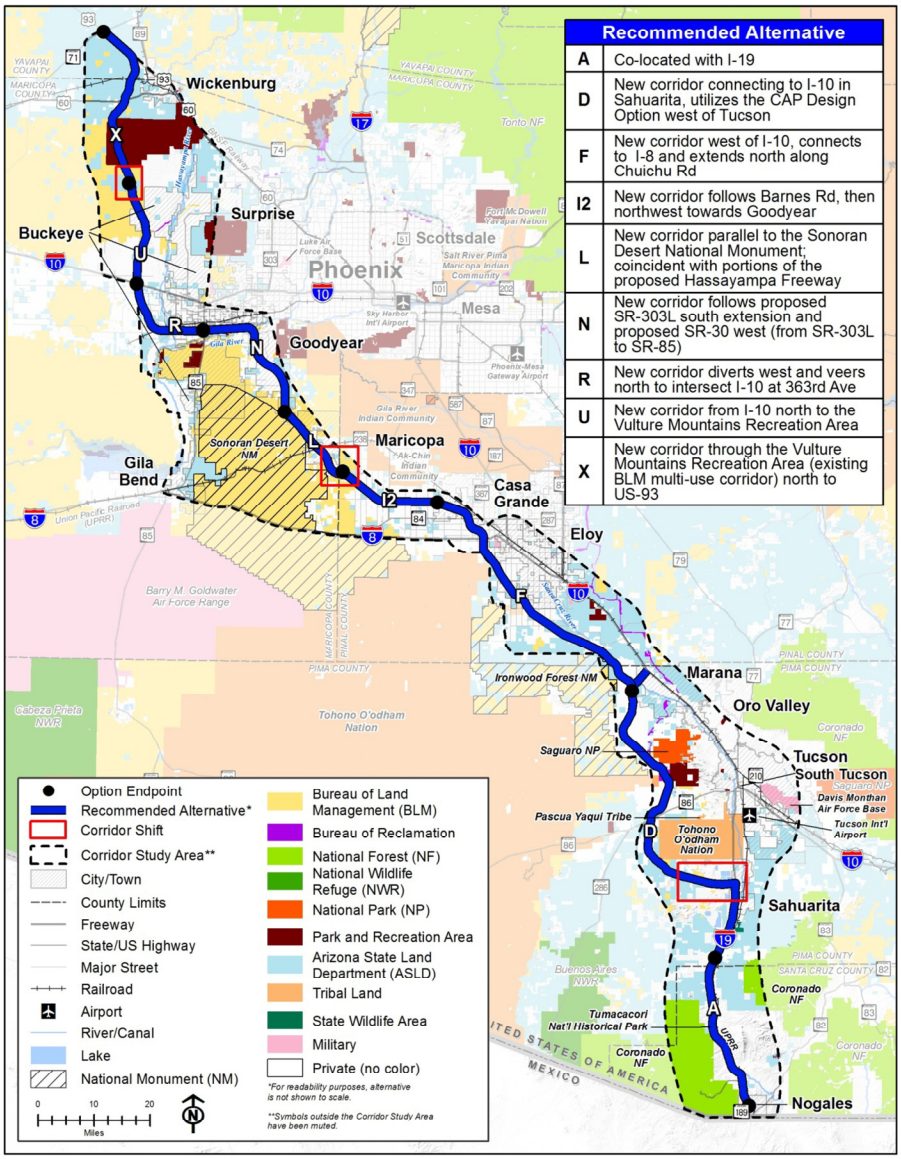
In May 2019, the I-11 Draft Tier 1 Environmental Impact Statement (EIS) and Recommended Corridor Alternative was published by ADOT and FHWA for public review and comment. The Recommended Alternative is a 2,000 feet wide corridor (not specific roadway alignment). This corridor would encompass the alignment for the I-11 highway, which would be approximately 400 feet wide. **Figure 2-17** shows the Recommended Corridor Alternative published in May 2019. It is anticipated that the Record of Decision will be issued by ADOT and FHWA in the Fall of 2020.

The City of Buckeye has completed a review of the published I-11 Draft Tier 1 EIS and does not support the recommended Alternative Alignment; the review was based on an internal in-depth analysis of the Draft EIS by the City. The findings of the review were documented in a detailed white paper and express the City's concerns as well as the City's vision and preferences related to the I-11 corridor. Additionally, these concerns and preferences were communicated to ADOT in a formal letter from the City Mayor on July 2, 2019, expressing the City's position. Both the white paper and the City's formal letter are included in the TMP in Appendix A.

MAG I-10 / Hassayampa Valley Roadway Framework Study

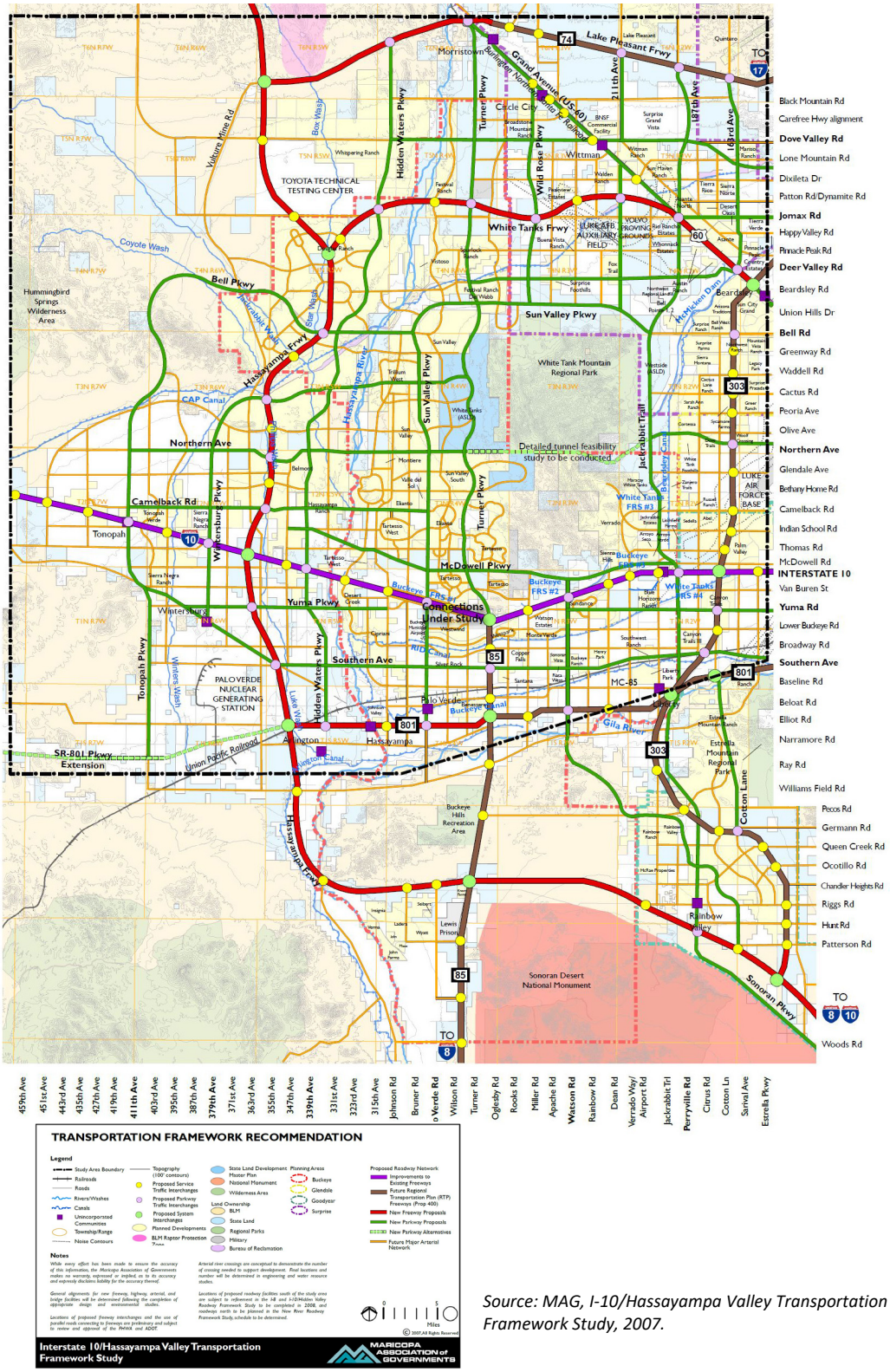
The Hassayampa Valley Roadway Framework Study, the "Hassayampa Study", was completed in 2008 to plan adequate roadways in areas where growth is expected. The Hassayampa Study covers approximately 1,400 square miles, from SR 303 on the east, 459th Avenue on the west, SR-74 on the north, and the Gila River on the south. The purpose of the Hassayampa Study was to plan adequate high-capacity roadways to prevent I-10 from becoming too congested. Through the study, a conceptual roadway framework was recommended, which included a final Hassayampa Valley roadway network map as well as major modifications to the network. **Figure 2-18** shows the recommended transportation framework, which was used by the City to create the future transportation network in Buckeye.

Figure 2-17: ADOT I-11 Corridor Draft Tier 1 EIS



Source: Draft Tier 1 EIS, March 2019.

Figure 2-18: MAG Hassayampa Valley Framework Study, Recommended Transportation Framework

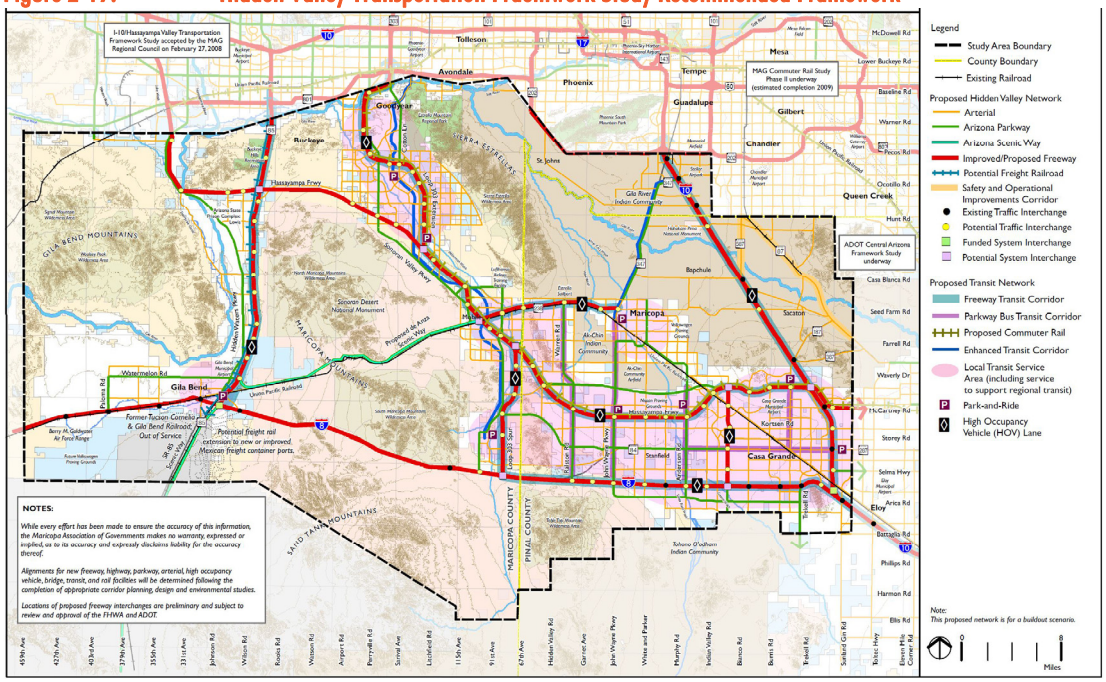


Source: MAG, I-10/Hassayampa Valley Transportation Framework Study, 2007.

MAG I-8 / Hidden Valley Transportation Framework Study

The Hidden Valley Transportation Framework Study was completed in 2008 to plan adequate roadways in areas where growth is expected. The study covers approximately 3,000 square miles, from Gila River on the north, the I-8 corridor on the south, Overfield Road on the east, and 459th Avenue on the west. The study area encompasses the south end of Buckeye, which was not addressed by the Hassayampa Study. Like the Hassayampa Study, the Hidden Valley Study recommended a transportation framework for the study area, which included a roadway network map as well as recommended major modifications to the network. The recommended transportation framework is shown on **Figure 2-19**.

Figure 2-19: Hidden Valley Transportation Fraemwork Study Recommended Framework

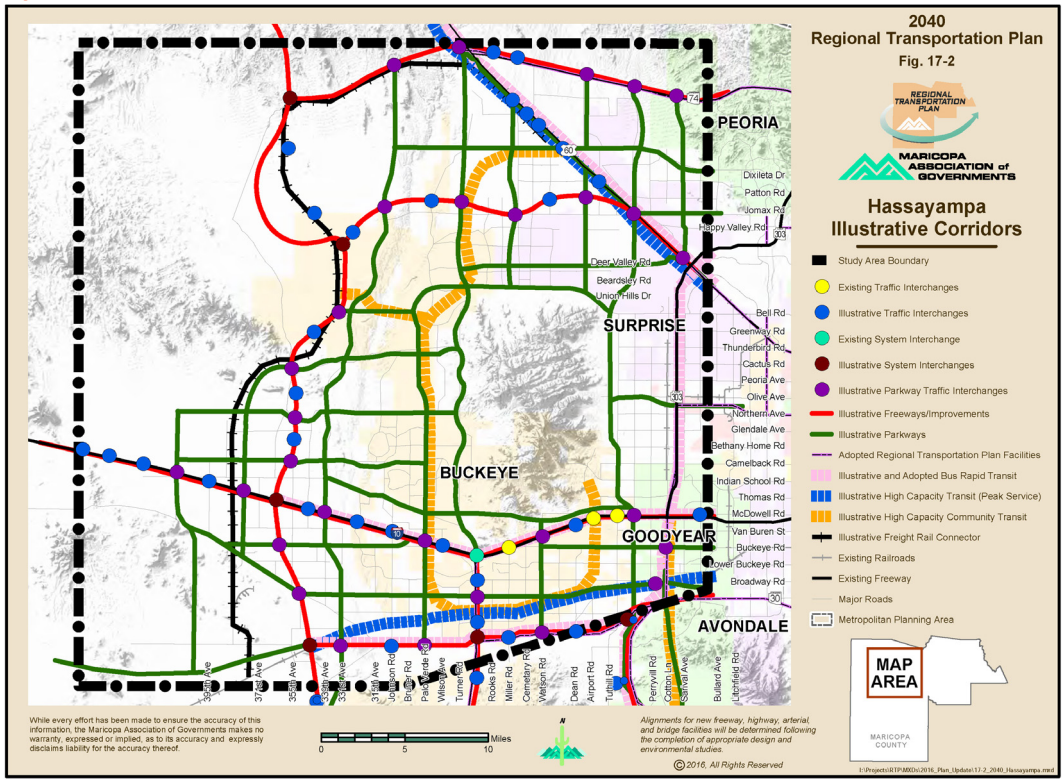


Source: MAG, I-8/I-10 Hidden Valley Transportation Framework Study, 2009.

MAG 2040 Regional Transportation Plan

The Regional Transportation Plan (RTP), updated in 2017, provides a regional framework for all major modes of transportation through the year 2040. The RTP identifies general purpose lanes on I-10 and interim SR 30 corridor development as freeway / highway projects in Buckeye to occur between FY 2027 and FY 2040. Additionally, the RTP shows additional bus lines on I-10 and Baseline Road and a RAPID / Express route on I-10 to be completed between FY 2017 and FY 2040. RTP identified improvements are listed in Chapter 9 Recommendations and Implementation. **Figure 2-20** shows the corridors that are recommended in the RTP.

Figure 2-20: MAG RTP Recommended Corridors



Source: MAG RTP, 2017.

MAG Transportation Improvement Program

The MAG Transportation Improvement Program (TIP), last updated in 2017, is a five-year guide for public transportation services across Maricopa County for FY 2018 – FY 2022. The TIP identifies highway related projects that are currently underway or planned for Buckeye for FY 2018 - 2022. The majority of the improvements listed for Buckeye are for street improvements, and are shown in Table 2-5.

Table 2-5: MAG TIP Improvements in Buckeye

Road	From	To	Description	Year
Apache Road	Lower Buckeye Road	SRP/WAPA powerlines	Roadway widening	2021
Apache Road	RID Canal	Lower Buckeye Road	Construct two through lanes	2021
Apache Road	Yuma Road	WAPA powerlines	Construct two through lanes	2022
Dean Road	RID Canal	Southern Avenue	Street improvements	2022
Indian School Road	Sunrise Lane	Verrado Way	Construct two through lanes	2020
McDowell Road	Dean Road alignment	Verrado Way	Construct two through lanes	2019
McDowell Road	Verrado Way	202nd Avenue	Construct four-lane road	2019
Miller Road	Lower Buckeye	RID Canal	Construct through lanes	2019
Miller Road	Maricopa Road	Narramore Avenue	Street improvements (east side of street)	2020
Miller Road	Narramore Avenue	Hazen Road	Street improvements	2020
Perryville Road	McDowell Road	Roosevelt Street	Construct two additional southbound lanes	2019
Pinnacle Peak Road	259th Avenue alignment	271st Avenue	Construct new six-lane road	2021
Rainbow Road	Durango Street	RID Canal	Construct two through lanes	2020
Rooks Road	Baseline Road	MC-85	Construct new two-lane road, intersection and railroad crossing improvements	2019
Southern Avenue	Apache Road	Miller Road	Construct four through lanes	2021
Southern Avenue	Watson Road	231st Avenue alignment	Construct four through lanes	2022
Thomas Road	Acacia Way	Tuthill Road alignment	Construct new tow-lane road	2019
Turner Road	Baseline Road	0.5 miles north	Construct two through lanes	2019
Watson Road	Durango Street	Lower Buckeye Road	Street improvements	2019
Watson Road	Extension	MC-85	Construct new roadway crossing over Palo Verde Nuclear Generating Station water line, BID Canal, and railroad tracks	2019
Watson Road	Lower Buckeye Road	Roosevelt Irrigation District Canal	Construct two through lanes	2019
Westpark Loop Road	Rooks Road	Rooks Road	New four lane roadway	2021
Yuma Road	Tuthill Road	199th Avenue	Construction of ultimate half street	2019

Source: MAG Transportation Improvement Program, 2016

2.6 Street Design

Within the City of Buckeye, the *Engineering Design Standards Section 6-3, Street Planning and Design Criteria* (Design Standards) design and configuration standards are set for all City-owned roadways, intersections, street access/driveways, sidewalks, roundabouts, bridges, retaining walls, structure clearances, side slopes, half streets, pavement transitions, subdivision street planning, as well as other transportation-related elements. The Design Standards include typical roadway design elements as well as typical cross-section designs for City street classifications. The following are descriptions of each type of roadway in Buckeye:

Parkway

Parkways provide regional connectivity. Parkways are owned and operated by either MCDOT or the City of Buckeye. The design standards for Parkways must follow the standards outlined in the *MCDOT Design Guideline Recommendations for the Arizona Parkway* as modified by the City. The ADOT functional classification equivalence to Parkway is Urban Principal Arterial and the MAG facility type equivalence is Major Arterial.

Major Arterial Street

Major Arterial streets provide connectivity and traffic movement for large traffic volumes. Access on Major Arterial streets is limited to facilitate traffic movement. The ADOT functional classification equivalence to Major Arterial is Urban Minor Arterial and the MAG facility type equivalence is Major Arterial.

Arterial Street

Arterial streets provide connectivity and movement of traffic for moderate volumes of traffic. Access on Arterial streets is limited to the greatest extent possible to facilitate traffic movement. The ADOT functional classification equivalence to Arterial streets is Urban Minor Arterial and the MAG facility type equivalence is Major Arterial.

Major Collector Street

Like Arterial streets, Major Collector streets provide connectivity and movement of traffic for moderate volumes of traffic. The ADOT functional classification equivalence to Major Collector is Urban Collector and the MAG facility type equivalence is Collector.

Commercial Collector Street

Commercial Collector streets provide movement of traffic within commercial, business, industrial, and other areas that are not residential The ADOT classification equivalence to Commercial Collector is Urban Collector and the MAG facility type equivalence is Collector.

Collector Street

Collector Streets provide for traffic movement between Arterials streets and Local streets. The ADOT classification equivalence to Collector is Urban Collector and the MAG facility type equivalence is Collector.

Major Local Street

Major Local streets provide for traffic between Collector streets and Local streets. The ADOT classification equivalence to Major Local streets is Urban Local street and there is no equivalence for MAG facility type.

Local Street

Local streets provide direct access to abutting land uses, provide access to collector street system, as well as accommodate low traffic volumes. Local streets are designed to discourage high travel speeds and are not intended for through traffic. The ADOT classification equivalence to Local street is Urban Local street and there is no equivalence for MAG facility type.

Residential Entrance

Residential entrances are street sections that are used to connect Local streets to either Collectors or Arterials. There is no ADOT classification or MAG facility type equivalence for residential entrances.

2.7 Street Network Connectivity and Multimodal Integration

The Imagine Buckeye 2040 General Plan includes a strategy recommendation for the City to create a network of streets that safely accommodates all users: "The City of Buckeye should design roads for multimodal accessibility, including transit, bicycles, and pedestrians." The City Engineering Department manages the Design Standards for roadway designs. The Design Standards include typical cross-sections for all roadway classifications, as described in Section 2.6. Each of these roadway cross-sections provides accommodation for multiple modes within the rights-of-way. Multi-modal considerations are a new movement transportation planning and is generally accepted as an industry best practice. As best practices in multimodal integration evolve, the City will continue to update these standards to reflect preferred conditions for the safe integration of all modes of travel.

Sustaining a system of multimodal facilities will provide a safe transportation system for all users regardless of age or ability. Making a community safe to walk, bicycle, and use transit fosters improved health, encourages community interaction, promotes sustainability, and portrays environmental stewardship. As communities grow, these facilities enhance opportunities for transit use and diverse mobility options for all travelers. It is important to note that safe accommodation of all modes cannot always be achieved on every street. Certain factors, such as available right-of-way, street character, terrain, and land use/development context, can limit modification of a street to accommodate all modes of travel. The overall goal is to provide a

complete network of streets that provide a safe and reasonably efficient mobility for multiple modes of travel. In essence, not every street needs to accommodate all modes, but every mode needs to have a reasonable place in the network.

Subdivision regulations are a valuable tool in incrementally implementing multimodal facilities with each new development. Related to this, the City may choose to review the subdivision regulations at the time of modifying street cross-sections to determine if the subdivision regulations are appropriately accommodating for non-motorized users. For example, most communities require sidewalk construction at the time of new development; however, some communities are also requiring developers to construct bus stop shelter pad sites, or to improve the street connectivity ratio in site planning efforts.

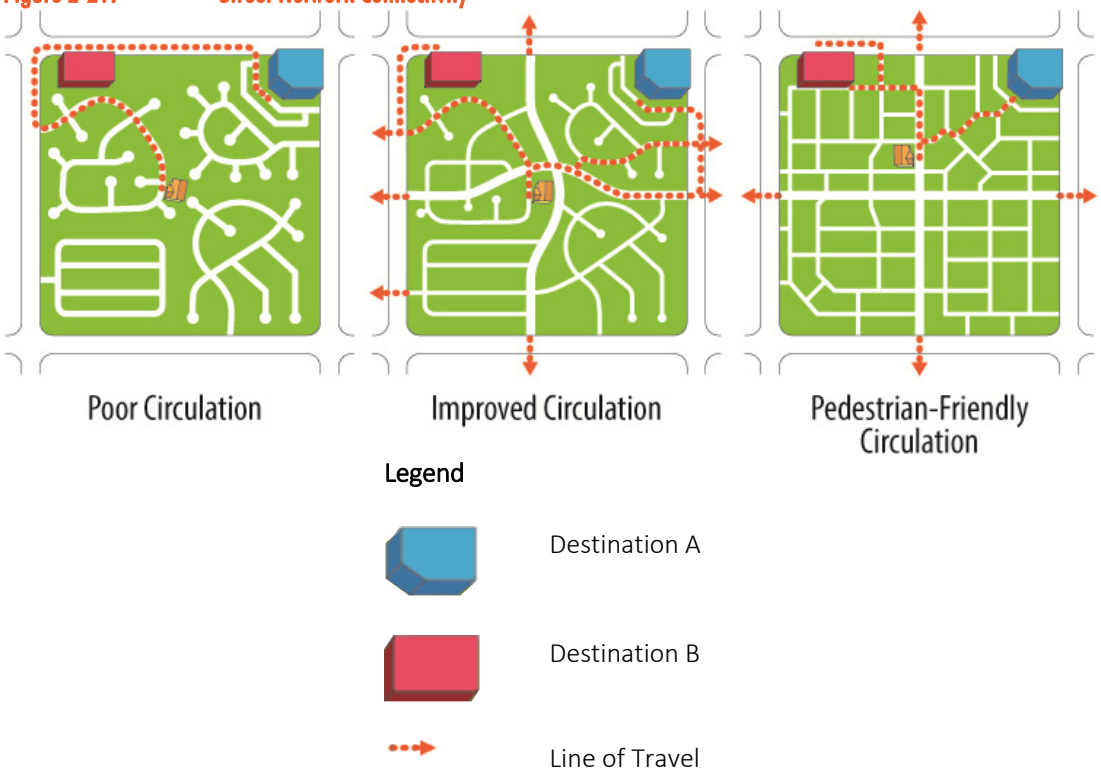
Street Network Connectivity

Connectivity within and between neighborhoods is important in encouraging pedestrian and bicycle travel as well as reducing reliance on Arterial streets for vehicular trips. This means laying out streets within and between neighborhoods that would provide a direct route of travel between origin and destination. This point involves the ongoing execution of subdivision regulations. Many communities utilize subdivision regulations as a tool that requires master developers to plan and construct roads within their development. Too often subdivision regulations do not emphasize the significance of creating an internal transportation system that would allow people to easily navigate from nearby commercial or institutional areas to their home and too often it is assumed every trip is vehicular.

Figure 2-21 illustrates this point. A typical suburban subdivision pattern with many cul-de-sacs and loop streets create long circuitous routes of travel, poor circulation, and no relief route for the Arterial street. An improved circulation condition would create internal Collector streets that connect neighborhood to neighborhood. In terms of achieving the best mobility for all transportation system users, the recommended conditions would be to provide a street pattern that allows for many access points and alternative routes while also shortening the travel distance to or from a nearby destination.

It is the recommendation of this TMP that all half-mile collectors enter and exit at the half-mile location and provide a direct connection to adjacent half-mile collectors. It is the recommendation of this TMP that the existing subdivision regulations be examined and possibly updated for the enforceability of these concepts.

Figure 2-21: Street Network Connectivity



Determining Trade-offs in Multimodal Accommodation

All modes of transportation impact one another. For example, a high level of service (LOS) for automobiles is likely to cause high travel speeds and potentially high traffic volumes; consequently, the bicycle and pedestrian environment is often negatively impacted resulting in a low LOS for these modes. The process of implementing multimodal designs is based on the principle of tradeoffs in roadway design.

Although roadway design standards are determined in the City of Buckeye Design Standards and provide the preferred design for each roadway cross-section, an understanding of a roadway's modal priorities is necessary in determining how to address roadway design challenges. The engineering design of roadways often requires custom design to ensure safe accommodation of all modes within the right-of-way. Understanding the development context is an important consideration. It is important that urban roadway design standards promote mixed-traffic activity and identify modal priorities by street type and character of development.

Figure 2-22 and Table 2-6 provide an example of how to develop standard cross-sections for multimodal accommodation for streets greater than Local streets. As illustrated in Figure 2-22, a standard roadway is divided into three parts: the travel way (including vehicles and on-street

bicycles), the pedestrian realm (including pedestrians, off-street bicycles, and other mobility-assistance devices), and the development realm (including the adjacent land use characteristics). Table 2-6 indicates how the City could prioritize accommodation of each travel mode in a variety of development contexts. It is the goal that this table will provide guidance for 90% of development, but does not establish a preferred direction for all corridor designs. The City Engineer may only provide exceptions in limited special circumstances. It indicates that more urban development contexts require a higher priority be placed on alternative modes of transportation (i.e., pedestrians, bicyclists, and transit operations and facilities); conversely, more rural development contexts typically entail a higher priority be placed on traditional vehicular traffic but allow for sufficient right-of-way to allow future improvements as the area becomes more urbanized.

It is the recommendation of this TMP that as new streets are designed that the design alternatives are assessed in light of the mode priorities identified in Table 2-6.

Figure 2-22: Component Parts of a Street

Table 2-6: Typical Travel Mode Priority by Development Context

Development Context	Travel Mode Priority				
	1	2	3	4	5
Urban Commercial/Mixed Use	Automobile	Walk	Transit	Bicycle	Freight
Urban Industrial	Freight	Automobile	Transit	Walk	Bicycle
Urban Residential	Walk	Bicycle	Automobile	Transit	Freight
Urban Single Use	Bicycle	Automobile	Walk	Transit	Freight
Suburban Commercial	Automobile	Transit	Walk	Bicycle	Freight
Suburban Industrial	Freight	Automobile	Transit	Walk	Bicycle
Suburban Residential	Walk	Automobile	Bicycle	Transit	Freight
Suburban Mixed Use	Walk	Bicycle	Transit	Automobile	Freight
Suburban Single Use	Bicycle	Automobile	Walk	Transit	Freight
Rural Residential/Agricultural	Automobile	Bicycle	Walk	Transit	Freight
Rural Village	Walk	Automobile	Bicycle	Transit	Freight

2.8 Travel Demand Modeling

As a federally-authorized Metropolitan Planning Organization (MPO), MAG monitors traffic flows and mobility. This effort involves the collection and distribution of information pertaining to traffic volumes, roadway capacity, transportation crashes, unpaved roads, and several other network factors to member jurisdictions.

MAG produces volume and capacity data every two to four years for use in travel demand modeling. Given Buckeye's location in the rural area of the MAG region, traffic counts are collected less frequently than is typical for urban areas of the region. In total, nine traffic count locations were recorded in the 2015 Annual Average Weekday Traffic Volume Map within the Buckeye city limits. Furthermore, roadway capacity is estimated by the reported lane configuration of the roadways. Therefore, the traffic volume data and capacity thresholds are considered estimates, not actual counts, used in the travel demand modeling efforts associated with the TMP. The outcome of the travel demand modeling process includes anticipated roadway segment capacity, traffic volumes for that segment, and the resulting level of service for the roadway segment.

Level of Service

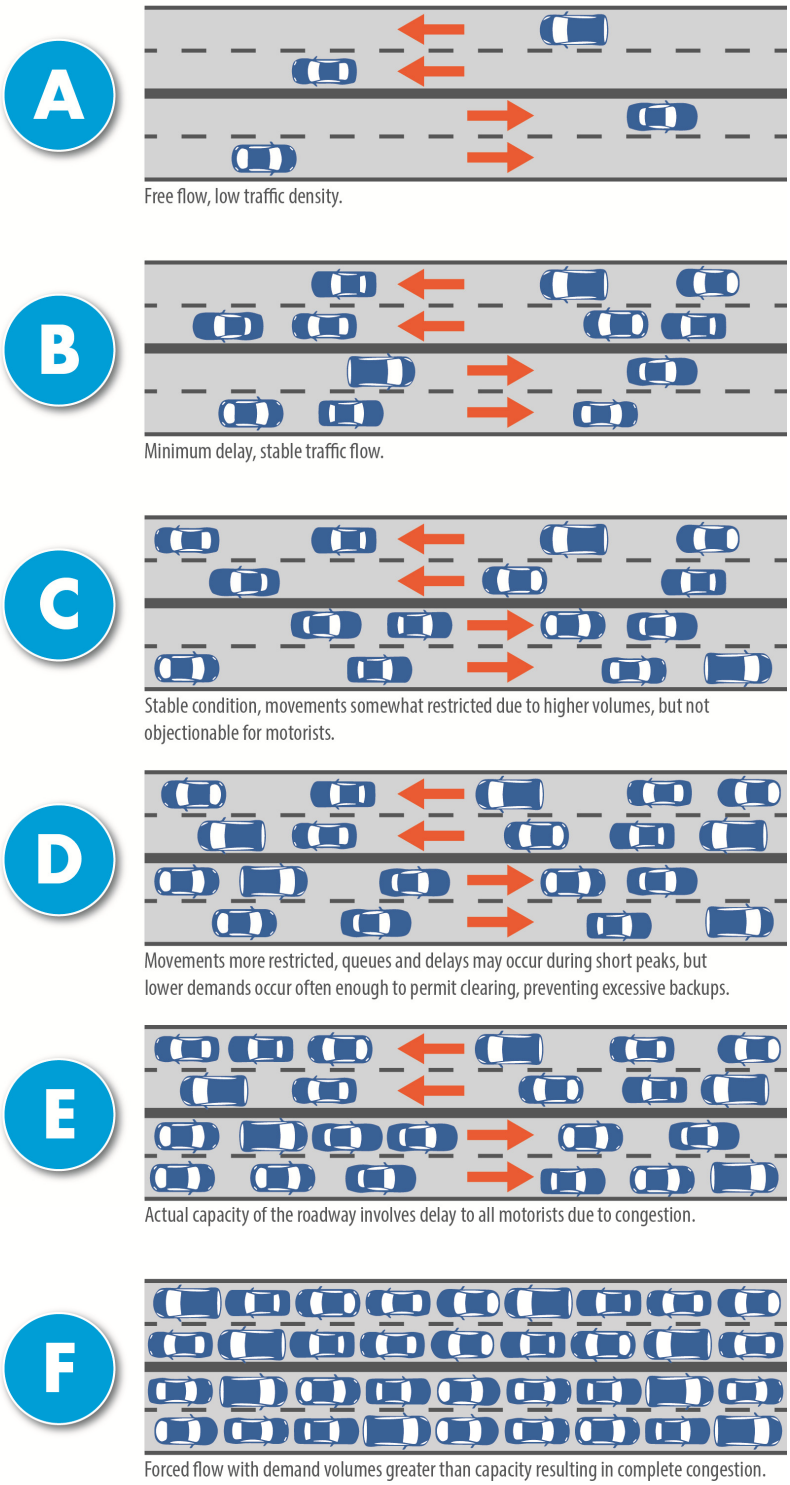
Level of Service (LOS) is a way to measure the existing or anticipated traffic congestion on roadways, providing a quantitative score for operational health of the roadway. Roadways are scored "A" through "F", where "A" indicates free flow, low traffic density and "F" indicates travel volumes are greater than capacity resulting in roadway congestion. The following are descriptions of each LOS, which are illustrated on **Figure 2-23**:

- **A.** Free flow, low traffic density.
- **B.** Minimum delay, stable traffic flow.
- **C.** Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists.
- **D.** Movements more restricted, queues and delays may occur during short peaks, but lower demand occur often enough to permit clearing, preventing excessive backups.
- **E.** Actual capacity of the roadway involves a delay to all motorists due to congestion.
- **F.** Forced flow with demand volumes greater than capacity resulting in complete congestion.

LOS can be used to monitor potential transportation network congestion issues at city buildout. A common misconception of LOS is that all roadways should strive for a LOS grade "A". In developing areas like Buckeye, roads often have a higher LOS at initial construction due to excess of capacity, which degrades over time as the community builds out. Ultimately, establishing a target LOS for vehicular travel should be determined in light of the trade-offs in multimodal accommodation as described in Section 2.7. The City of Buckeye has established LOS "D" as their target LOS. LOS "E" or LOS "F" roadways should be mitigated so that at least LOS "D" can be achieved based on build-out conditions. For roadways that yield a LOS E or F, the following may be considered:

- Upgrade the roadway classification / configuration; or
- Conduct an intersection analysis / study to determine if improvements at intersections will improve LOS.

Figure 2-23: Level of Service Concept



Existing Conditions (2014)

Existing daily traffic volumes, taken from the MAG 2014 travel demand model, are shown on **Figure 2-24**. **Figure 2-25** illustrates known capacity thresholds as provided by MAG. No adjustments to the MAG travel demand model were made for these results. As of the 2014 data, the highest peak period volume occurs on I-10 in the segment between Perryville Road and Watson Road followed by peak period volume on I-10 between Watson Road and Palo Verde Road. On Arterial streets, the highest peak period demand generally occurs on streets south of I-10 that have direct access to I-10, such as Miller Road, Watson Road, and Verrado Way. As illustrated in the LOS analysis **Figure 2-26**, there is sufficient peak period capacity to accommodate peak period traffic volume on all City roadways since no roadway segments are showing LOS "E" or LOS "F".

2040 Conditions

The current horizon year model for MAG is the 2040 network model. These results came directly out of the existing MAG 2040 model and no modifications were made to socio-economic data or the roadway network. The results indicate that the only locations within the City of Buckeye's MPA that are operating at LOS "E" or LOS "F" are along Jackrabbit Trail between MC 85 and Elliot Road in the southeast corner of the MPA. All other roadway segments that operate at LOS "E" or LOS "F" are state roadways and occur along I-10 or SR-85.

The results from this model are shown on **Figures 2-27**, **2-28**, and **2-29**.

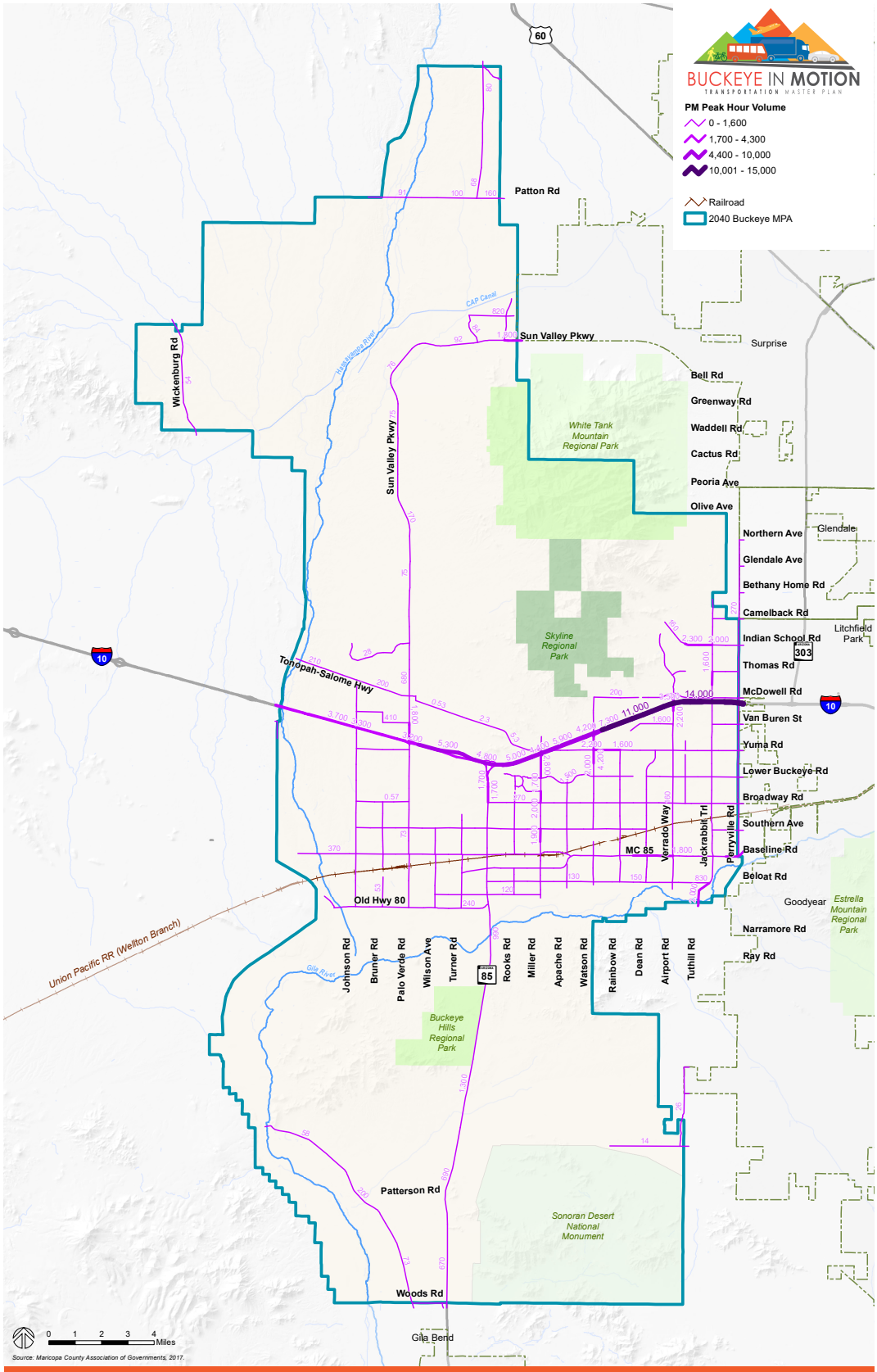


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Figure 2-24
2014 Traffic Volumes

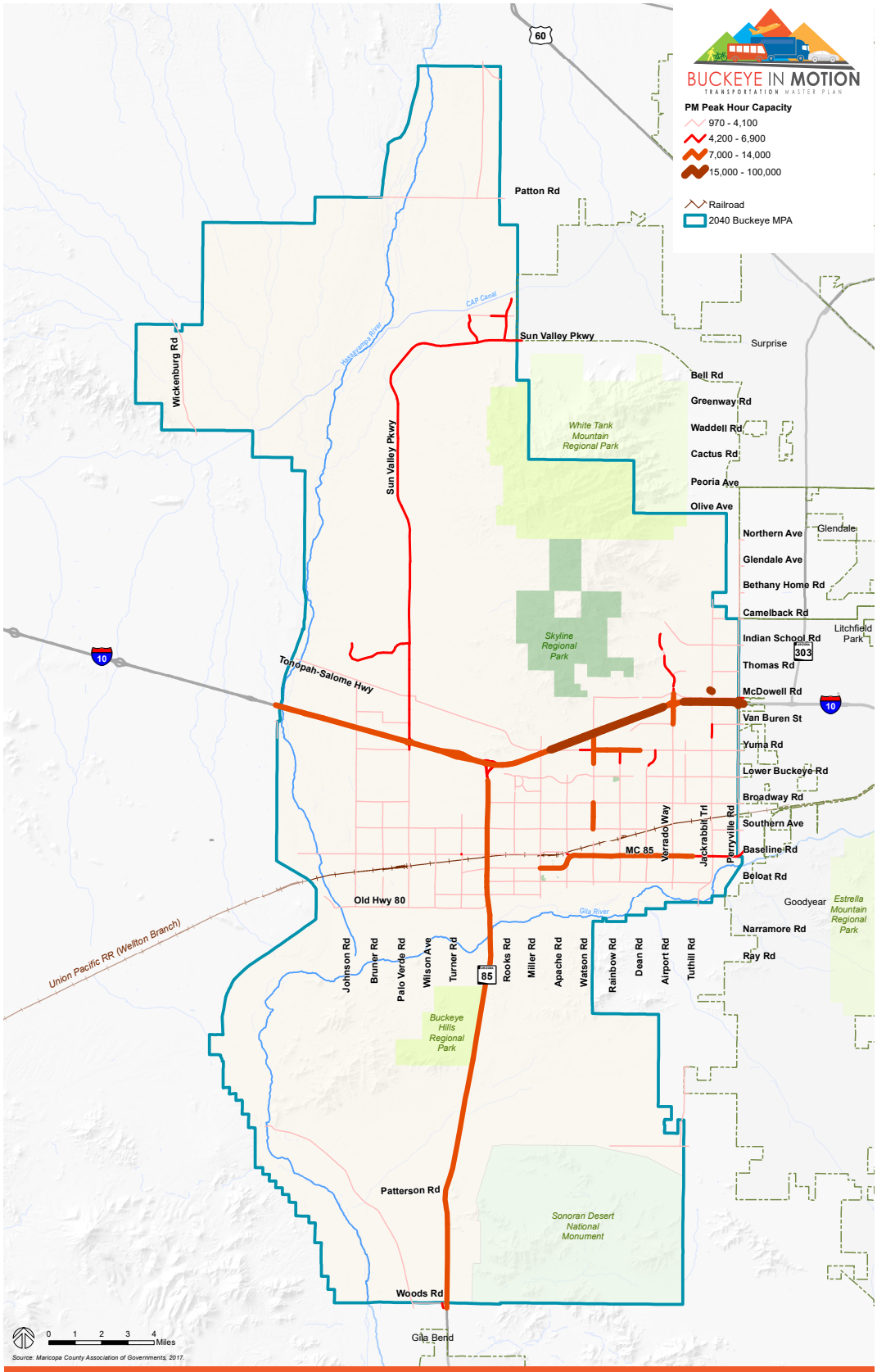

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Figure 2-25
2014 PM Peak Hour Capacity

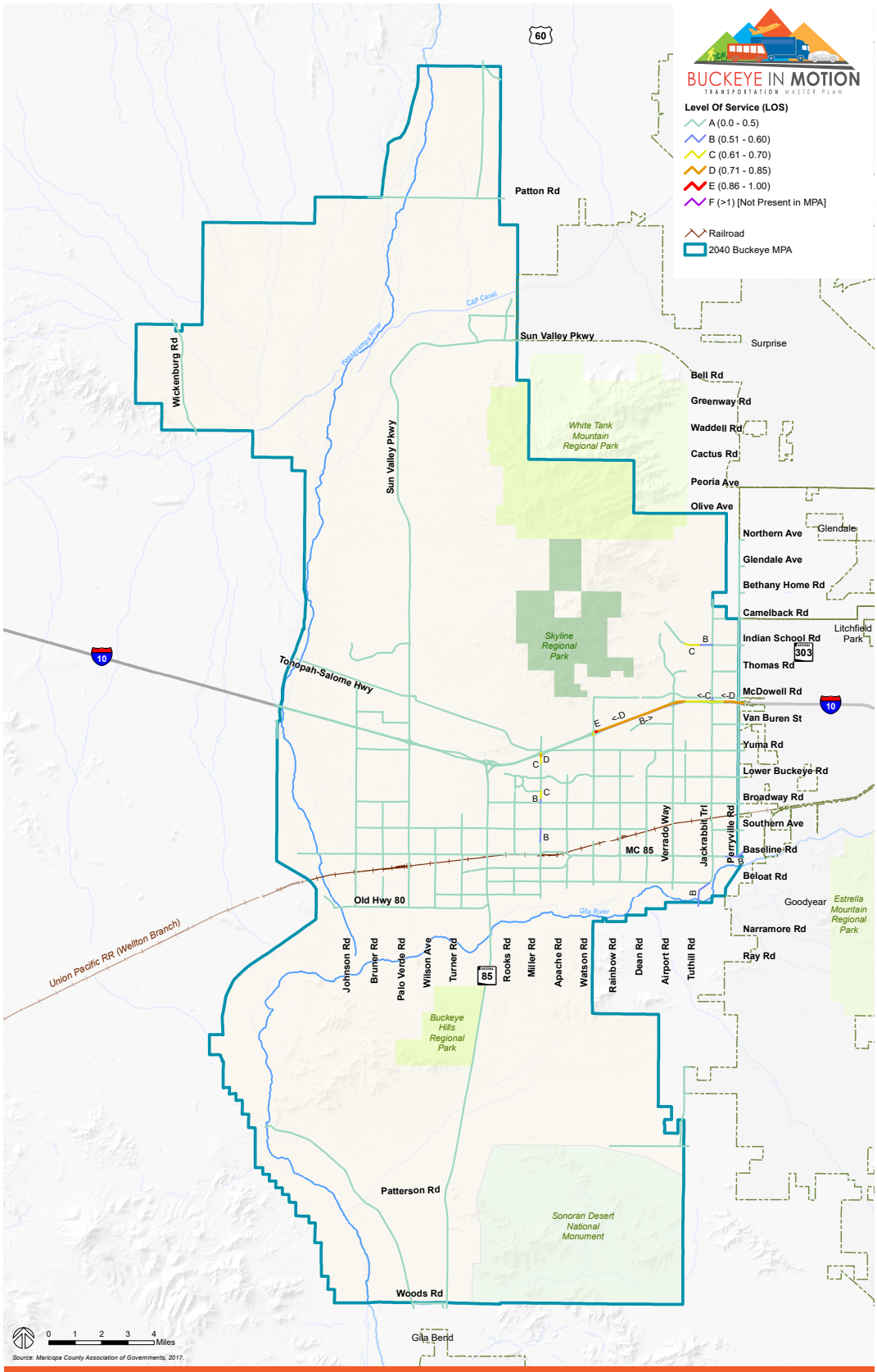

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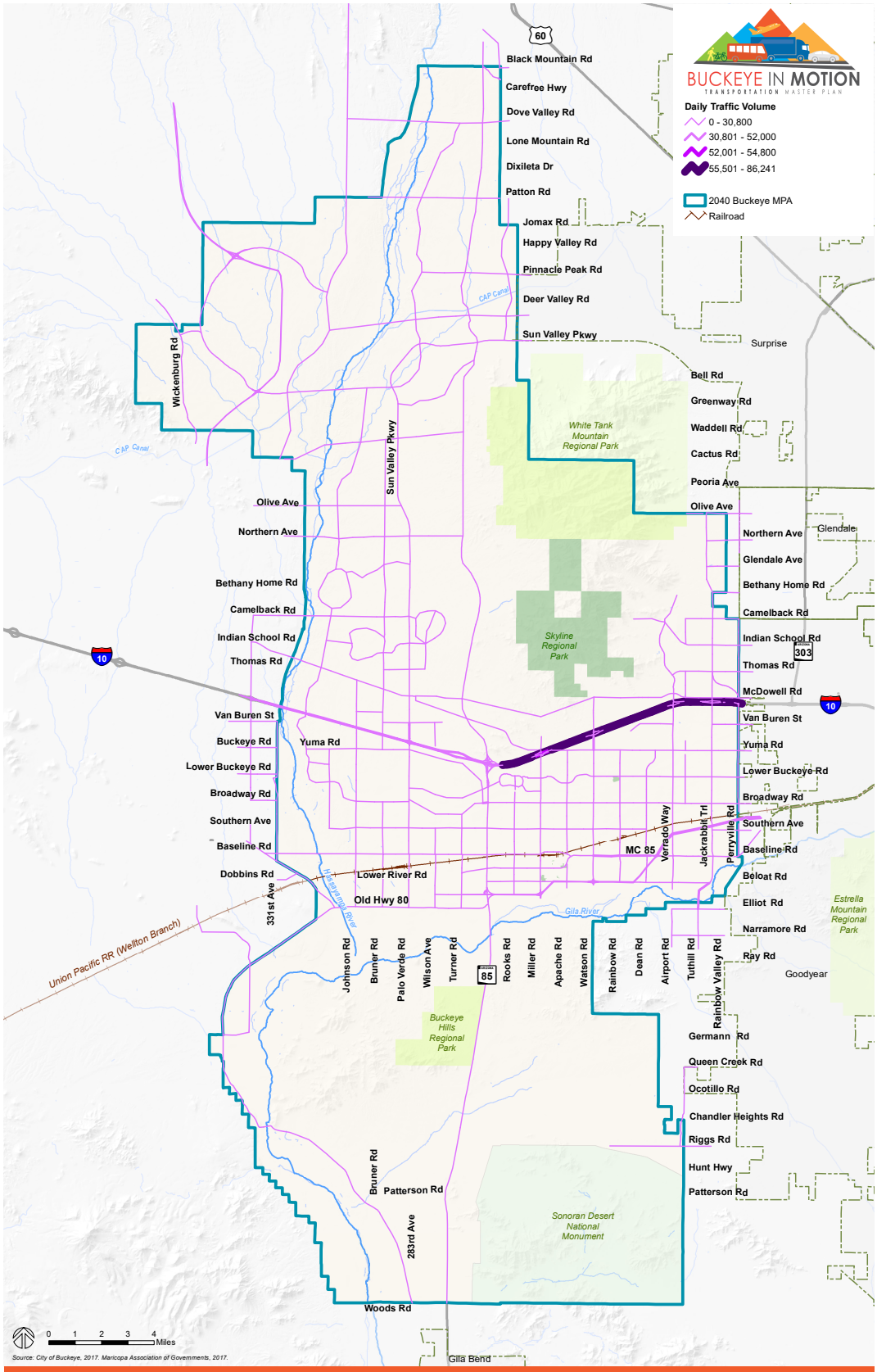
Figure 2-26
Level Of Service



Matrix DESIGN GROUP

Figure 2-27
MAG 2040 Traffic Volume

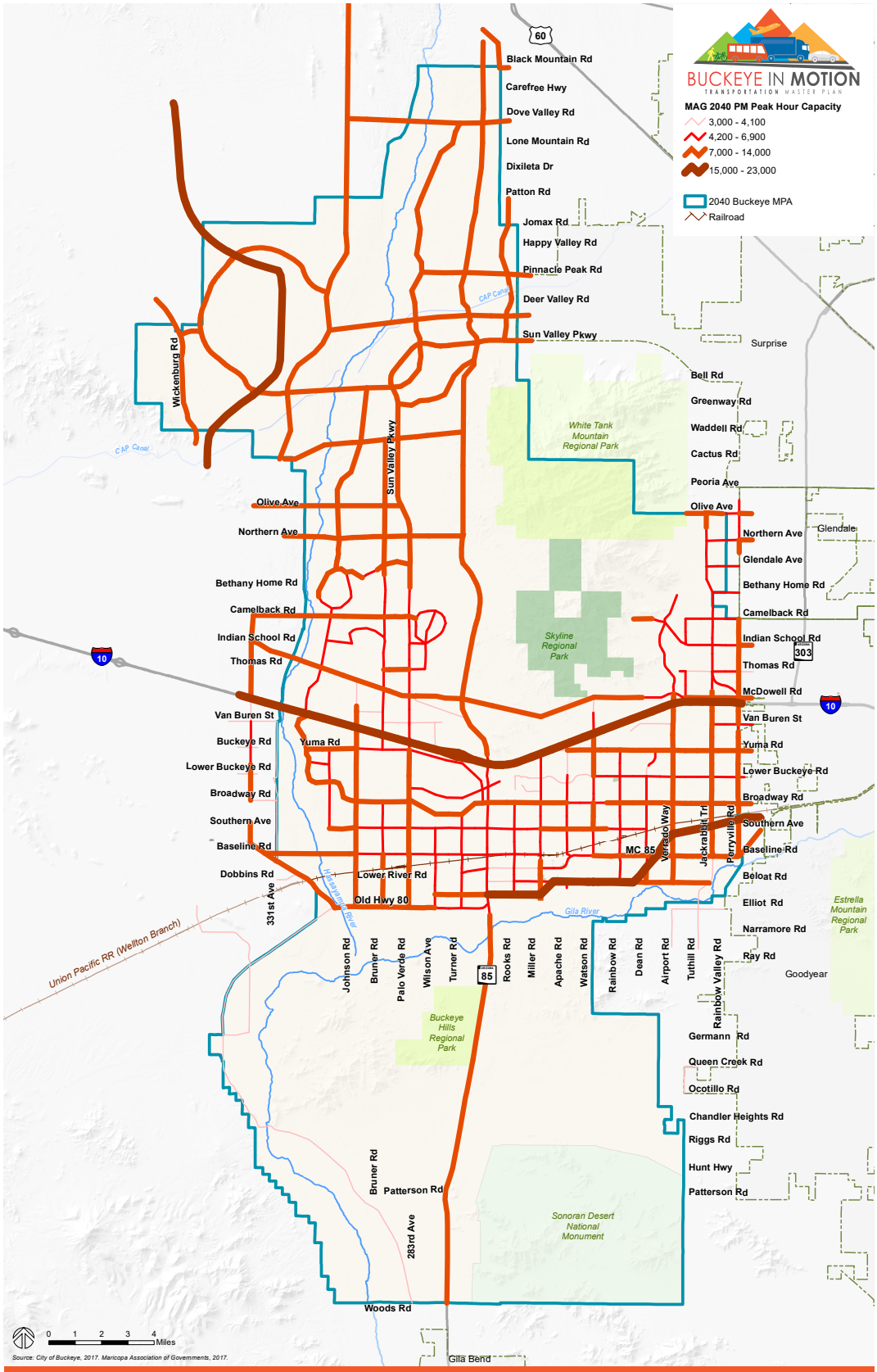


Figure 2-28
MAG 2040 PM Peak Hour Capacity

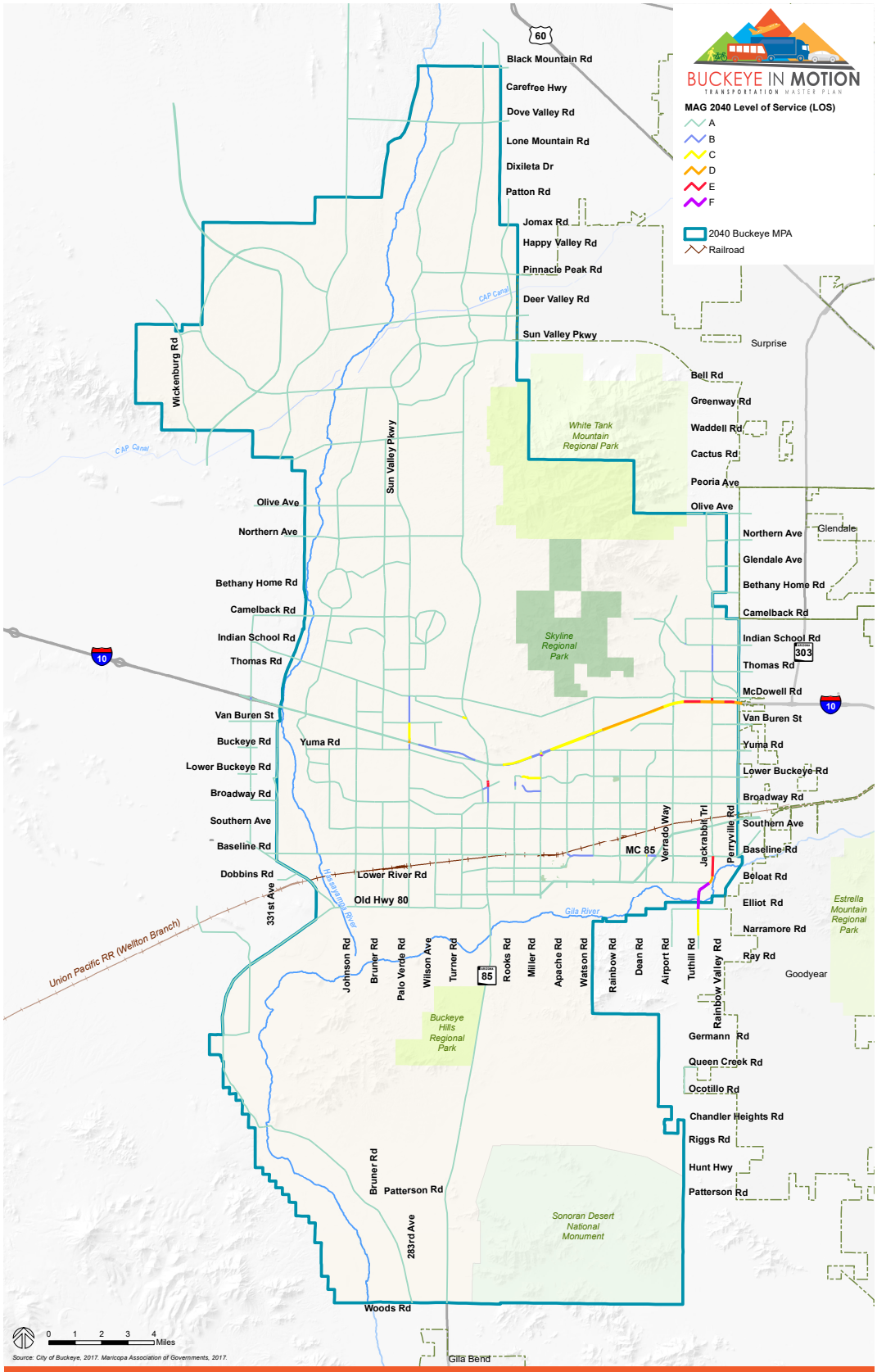


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Figure 2-29
MAG 2040 Level of Service

City of Buckeye Buildout Land Use

The City of Buckeye recently completed an update to the General Plan titled, **Imagine Buckeye 2040 General Plan**. The Imagine Buckeye 2040 General Plan was approved on April 3, 2018 and ratified on August 28, 2018. The future (buildout) land uses from this General Plan are shown on **Figure 2-30** and were used as the input for two different travel demand model scenarios. Scenario 1 assumes the City of Buckeye buildout land use on top of the roadway network used for the MCDOT Transportation System Plan 2035 (TSP 2035). Scenario 2 assumes City of Buckeye buildout land use on top of the City of Buckeye's ultimate roadway network.

Travel demand models have two types of input, socio-economic data (SED) and the roadway network. The SED consists of numbers of people in terms of population and employment. Different land uses from the buildout land use map from the 2040 General Plan had to be converted into SED. The geographic area that is being modeled is broken into traffic analysis zones (TAZs). Each TAZ is provided with SED. Each zone produces trips leaving and coming into the zone based on the SED. These trips are connected to the roadway network through a centroid connector (there may be multiple connectors for each TAZ). The model determines where all trips originate and end and then routes them along the roadway network. This produces traffic volumes on each modeled roadway. This is a high-level analysis that can be used to determine the size of different roadways; however, it is not detailed enough to determine intersection design or provide more detailed operational analysis.

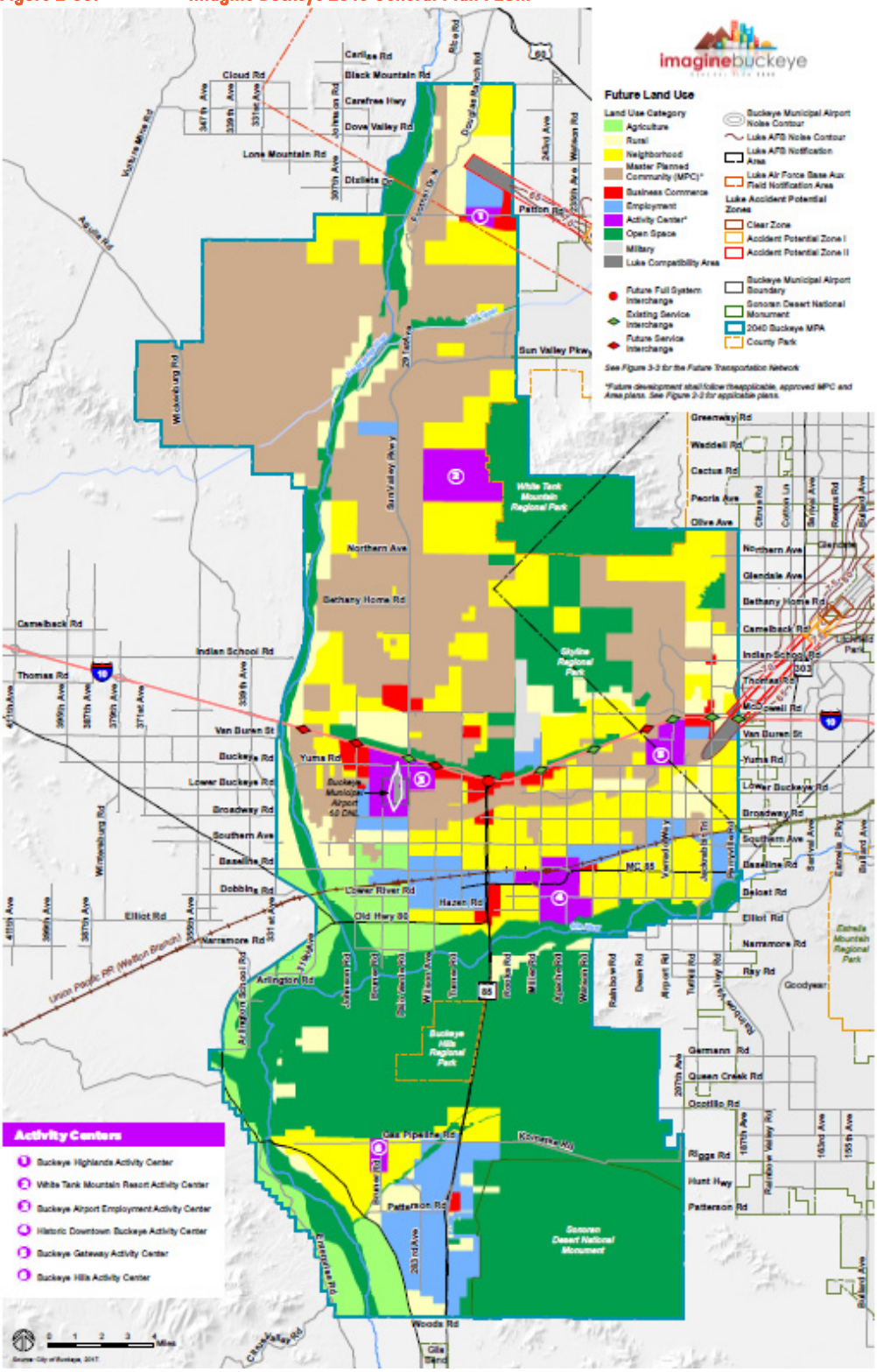
Because land use categories defined in the City's General Plan cannot be directly translated into demographic data to be used in the MAG travel demand model, the relation of land use type and its equivalent population and/or employment would need to be identified as the first step to update the MAG travel demand model. *MAG Socioeconomic Projection Documentation* dated June 2016 served as a reference to identify the relations between land uses (in square feet) and key demographics categories included in the MAG travel demand model. The conversion procedures are detailed in the following sections.

Methods and Factors for Developing Employment Projections

Development of employment projections involved calculation of usable floor area and identification of employment density for each non-residential building. The following land use categories were converted to equivalent employment data based on land use type (e.g. retail, industrial, office):

- Agriculture
- Business Park
- City Center
- Industrial
- Military
- Mixed Use (partial)
- Professional Office Employment
- Regional Commercial

Figure 2-30: Imagine Buckeye 2040 General Plan FLUM



Source: Imagine Buckeye 2040 General Plan

Floor Area Ratio

The first step was to estimate usable floor area for each building. This can be accomplished by applying floor area ratios (FAR) as shown in Table 2-7. FAR represents the ratio of the square footage of the building to the square footage of the parcel of land. The values in target FAR were used for this calculation.

Table 2-7: Floor Area Ratio

Buckeye Land Use	MAG Land Use	MAG Land Use Description	Min FAR	Target FAR	Max FAR
Community Commercial, Community Master Plan, Downtown Buckeye	250	Community Commercial	0.03	0.23	5.44
Regional Commercial	260	Regional Commercial	0.02	0.26	0.84
Industrial	330	Light Industrial	0.01	0.32	3.63
Mixed use	410	Office Low Rise	0.01	0.35	8.26
Government Center	551	Public Offices	0.03	0.94	7.66
Business Park	810	Business Park	0.06	0.21	0.32

Source: MAG Socioeconomic Projections 2016 Documentation.

Vacancy Rate

The second step was to estimate floor area that will be occupied. Per *MAG Socioeconomic Projections Documentation,* under the buildout condition, occupancy rate for industrial uses would be 92% while 93.5% and 89.5% occupancy rates are assumed for retail building and office building, respectively.

Employment Density

The next step was to calculate employment density that represents the floor space required by employees. This was calculated as occupied building floor space per employee as defined in the *MAG Socioeconomic Projections Documentation*. Table 2-8 summarizes Buckeye non-residential land use types and respective MAG employment density. To be conservative, this calculation assumed maximum square footage per job which generates the minimum number of employees required by each land use type.

Table 2-8: Employment Density – Square Feet Per Job by Building Type

Buckeye Land Use	MAG Land Use Description	Min Sq Ft Per Job	Target Sq Ft Per Job	Max Sq Ft Per Job
Community Commercial	Retail	330	640	2060
Regional Commercial	Retail	330	640	2060
Community Master Plan	70% Medium High Density	-	-	-
	30% Retail	330	640	2060
Professional Office	Office	140	330	990
Business Park	Office	140	330	990
Business Park/Industrial	70% Office	140	330	990
	30% Industrial	300	700	1650
Mixed Use	20% Hotel	420	1470	3560
	50% Retail	330	640	2060
	30% office	140	330	990
Downtown Buckeye	Retail	330	640	2060
Industrial	Industrial	300	700	1650
Government Center	Public - Local	70	250	610
Military	Industrial	300	700	1650

Source: MAG Socioeconomic Projections 2016 Documentation.

Based on the above conversion method, the resultant total employment projection for the City of Buckeye is 493,169. The total employment under the buildout condition anticipated by the City is 560,913. Therefore, a factor of 1.137 was applied globally to all the non-residential TAZs to match the employment control total provided by the City.

Methods and Factors for Developing Population Projections

Population projection development involved a two-step process: 1. Estimation of net residential density; 2. Calculation of number of persons in a residential unit. The following land use categories were converted to equivalent population and households to be used in the MAG travel demand model:

- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Medium High Density Residential
- High Density Residential
- Neighborhood Residential
- Vacancy Rate

Similar to the development for employment projection, the proportion of residential buildings being occupied was estimated using occupancy rates of 95% and 91% for single family residential and multi-family residential, respectively.

Gross to Net Density

Net density means that land area has been removed for transportation, right of way, and open space areas as part of the density given in the general plan document. An analysis of gross acres and net acres by different residential land use types was conducted as the first step to develop population projections. Table 2-9 provides the ratios of gross to net density by residential land use type. Table 2-10 summarizes residential density factors used to estimate the average number of households in each residential land use type.

Table 2-9: Net Residential Density

Buckeye Land Use	MAG Land Use	Description	Gross Acres	Net Acres
Very Low Density Residential	Estate Residential	1/5 du per acre to 1 du per acre	50	50
Low Density Residential	Medium Lot Residential	2-4 du per acre	50	38
Medium Density Residential	Small Lot Residential	4-6 due per acre	50	37.5
Medium High Density Residential, Neighborhood Residential	Medium Density Residential	5-10 du per acre	50	38.5
High Density Residential	High Density Residential	10-15 du per acre	50	41

Source: MAG Socioeconomic Projections 2016 Documentation.

Table 2-10: Average Residential Density

Buckeye Land Use	Average or Target Residential Density
Very Low Density Residential	0.5 du per acre
Low Density Residential	2 du per acre
Medium Density Residential	4.5 du per acre
Medium High Density Residential, Neighborhood Residential	8 du per acre
High Density Residential	12.5 du per acre

Source: MAG Socioeconomic Projections 2016 Documentation.

Persons per Household

To estimate the number of persons living in each residential building, assumptions were made based on the building location relative to I-10 which is the major east-west freeway in the City. Population south of I-10 tends to be an older population with less occupants per household. New housing stock that will be developed north of I-10 will have more families with higher number of people living in each household (children). A factor of 3.5 persons per household was used for the buildings north of I-10 while 2.5 persons per household was assumed for the buildings south of I-10. These assumptions were made based on persons per occupied house units presented in *MAG Socioeconomic Projection Documentation*.

Based on the above conversion method, the resultant total number of households and the population for the City of Buckeye in the buildout conditions are 557,738 and 1,794,493, respectively. To match the control totals forecasted by the City, global factors were then applied to the TAZs bringing the total number of households to 618,605 and the total population to 1,941,150 for the buildout conditions.

Methods for Developing MAG Model SED Inputs

The MAG model contains 45 socioeconomic fields including multiple categories in population, household income, and employment. The estimated totals developed through the previous sections would need to be distributed into various categories defined in the socioeconomic input file. A travel demand model is divided into Traffic Analysis Zones (TAZs). Values for the following fields (as shown in Table 2-11) in each TAZ were estimated using the total population, household, and employment numbers established previously. The distribution ratios of the fields in each demographic category were derived based on the original data in the MCDOT 2035 TSP model. The socioeconomic data is entered into the model for each TAZ and the model produce trips into and out of each of these zones. The trips into and out of each TAZ are assumed to be created in the center of the zone and are connected to the adjacent roadway network through the use of centroid connectors. Every zone must have at least 1 centroid connector for the trips to get onto the roadway network. The base total used to develop each demographic sub-category is also provided in Table 2-11. For instance, the values for the four population categories were developed from the total population.

Table 2-11: Socioeconomic Field Estimates

MAG Code	Description	Estimation Basis
POP1	Resident Population in Households	Total Populations
POP2	Resident Population in Group Quarters (excluding institutional facilities, military and correctional facilities)	Total Populations
POP3	Transient Population	Total Populations
POP4	Seasonal Population	Total Populations
HH1	Resident Households (Occupied Dwelling Units)	Total Households
HH2	Group Quarters Households (excluding nursing homes, military and prisons)	Total Households
HH3	Transient Households	Total Households
HH4	Seasonal Households	Total Households
EMP1	Other Employment (excluding Work-at-home and Construction employment)	Total Employments
EMP2	Public Employment	Total Employments
EMP3	Retail Employment	Total Employments
EMP4	Office Employment	Total Employments
EMP5	Industrial Employment	Total Employments

Table 2-11: Socioeconomic Field Estimates (continued)

MAG Code	Description	Estimation Basis
INC1	Households in lowest income quintile (Q1)	Resident Households (HH1)
INC2	Households in low income quintile (Q2)	Resident Households (HH1)
INC3	Households in medium income quintile (Q3)	Resident Households (HH1)
INC4	Households in high income quintile (Q4)	Resident Households (HH1)
INC5	Households in highest income quintile (Q5)	Resident Households (HH1)
DU9	Dwelling Units <10 Years Old	Total Households except Group Quarter Households
DU19	Dwelling Units 10-19 Years Old	Total Households except Group Quarter Households
DU29	Dwelling Units 20-29 Years Old	Total Households except Group Quarter Households
DU30	Dwelling Units 30+ Years Old	Total Households except Group Quarter Households

Source: MAG Socioeconomic Projections 2016 Documentation.

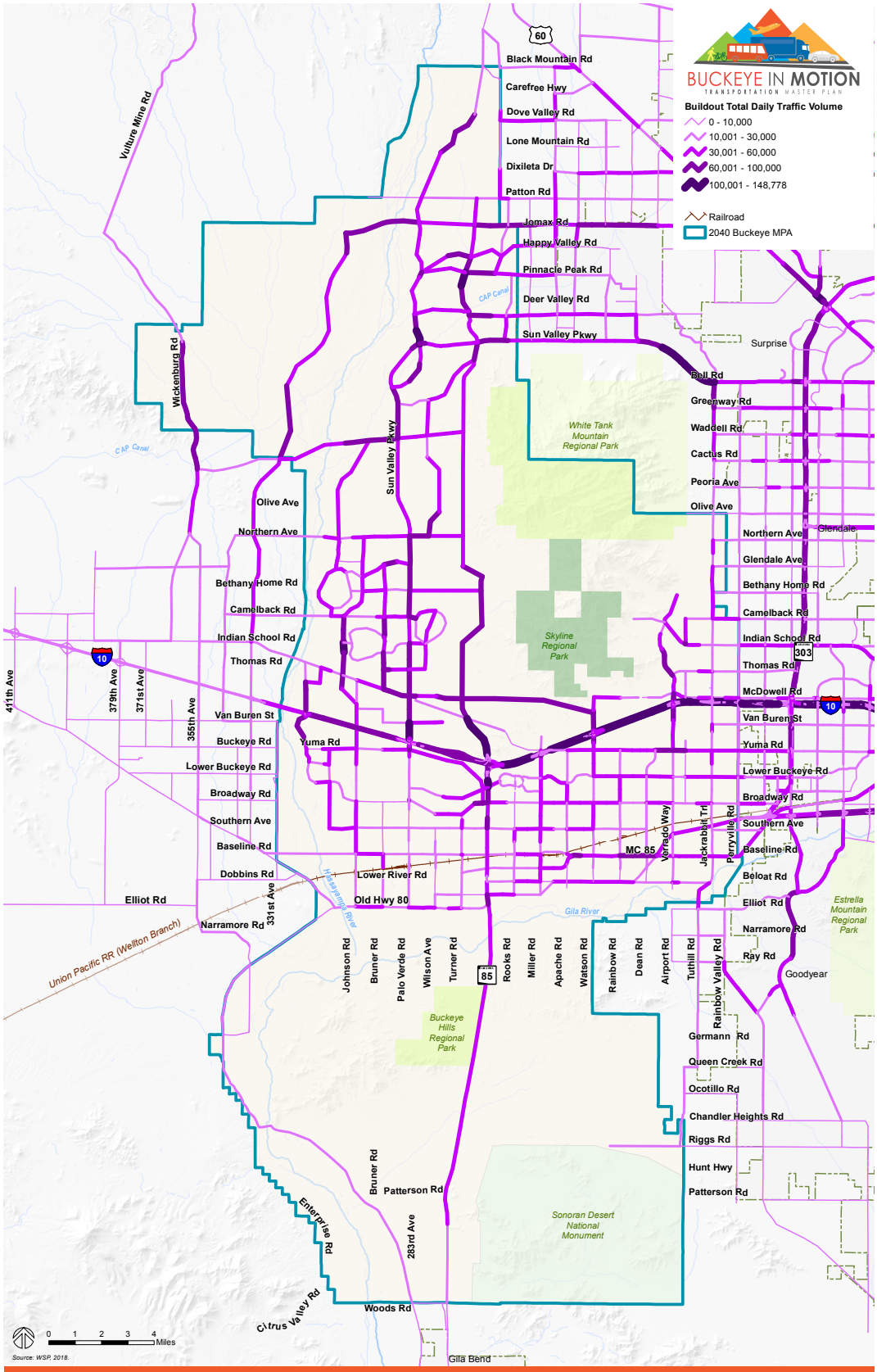
Scenario 1: Buildout on 2035 MCDOT Network

The MAG travel demand model was run with updated socio-economic data to represent buildout in the City of Buckeye as highlighted above. This socio-economic data was modeled on top of the MCDOT 2035 TSP roadway network. Since this roadway network is the latest that was modeled through the MAG travel demand model, it was decided to test whether this network would accommodate the City's buildout land use.

The MCDOT 2035 TSP Network does not assume that any roadways have been built to Parkway classification and that the largest roadway is a 6-lane major arterial. As can be seen from the model results, shown on Figures 2-31 and 2-32 many of the roadways throughout the MPA will realize LOS "E" traffic conditions. This is unacceptable and will not work to support the City's buildout condition.

Scenario 2: Buildout on Revised Hassayampa Network

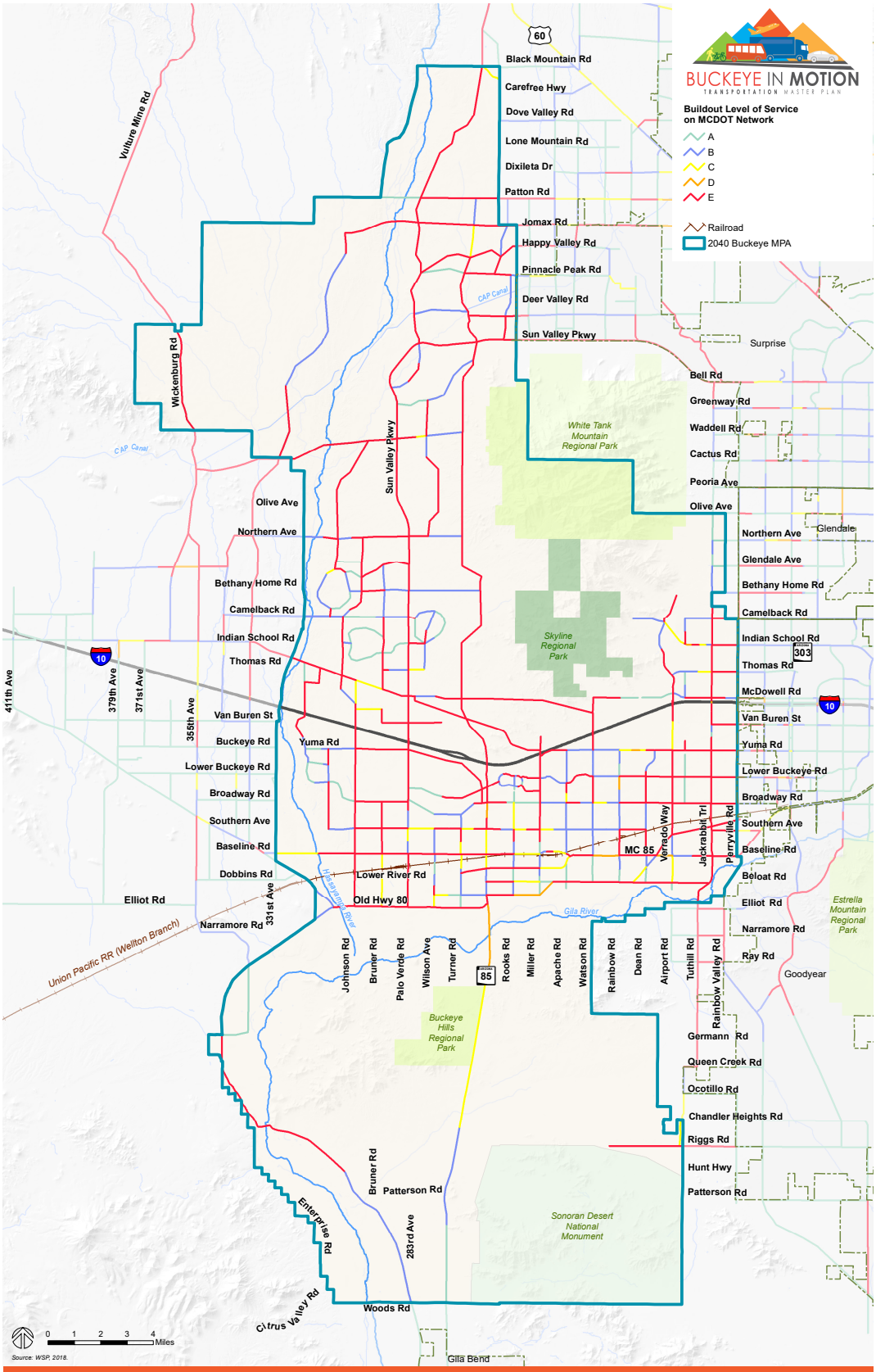
The City of Buckeye has consistently stated that the roadway network assumed in the *Hassayampa Valley Roadway Framework Study* is the City's adopted buildout roadway network. The *Hassayampa Valley Roadway Framework Study* was completed in September 2007; however, since then, there have been 26 approved community master plans (CMPs) within the City's MPA, one Maricopa County approved CMP, and two area plans. Each of these CMPs typically has a proposed roadway network as part of the approval. Additionally, Maricopa County has completed feasibility studies for several of the future parkways within the MPA. These parkway feasibility studies include Southern Parkway, Wintersburg Parkway, Deer Valley Parkway, Wild Rose Parkway, Camelback Parkway, Dove Valley Parkway, Greenway Parkway, Hidden Waters Parkway, McDowell Parkway, Northern Parkway, Turner Parkway and Yuma Parkway. All of these sources were combined to create the City's buildout roadway network.



Matrix DESIGN GROUP

Figure 2-31

Buildout Traffic Volumes on 2035 MCDOT Network



Matrix DESIGN GROUP

Figure 2-32

Buildout Level of Service on MCDOT Network

The City's buildout roadway network includes several parkways, which were assumed to be 6-lane parkways per MCDOT's parkway design guidelines.

When the City's buildout socio-economic data was run on top of the City's buildout roadway network, multiple roadway segments exhibited LOS "E" or LOS "F". These areas primarily occur along I-10 and on several of the 6-lane parkways. Due to the size of the TAZs, particularly north of I-10 and in the far south portion of the MPA, there are some arterial roadway failures that are more an artifact of the TAZ structure being too large and not properly distributing trips to the roadway network. The TAZ structure of the existing MAG model was established based on existing development patterns. Therefore, the older areas of Buckeye that are currently developed tend to have smaller TAZs in area and therefore better distribute the trips to the surrounding roadway network. Areas that are not yet developed, but will be by buildout, have large TAZs because a large area is needed to develop a small number of trips. When future development inputs are inserted into the large TAZs that do not currently reflect the future development level, the model creates a large number of trips but only distributes them to one or two roadways. This was resolved to some extent by adding additional TAZ centroid connectors to better distribute the traffic to more roadways. Although TAZ's need refinement, no significant improvements are anticipated. In the future, the City of Buckeye should consider working with MAG to refine the TAZ structure within the MPA to refine the buildout traffic projections.

The following improvements to the City of Buckeye's buildout roadway network should be made to accommodate buildout traffic volume projections:

- Improve Lone Mountain Road to a 6-lane Major Arterial between 287th Avenue and Canyon Springs Boulevard
- Improve Turner Parkway to an 8-lane Parkway between Lone Mountain Road and Bell Road
- Improve Jomax Road to a 6-lane Major Arterial between 287th Avenue and Canyon Springs Boulevard
- Improve 271st Avenue to a 6-lane Major Arterial between Sun Valley Parkway and Turner Parkway
- Improve Sun Valley Parkway to an 8-lane Parkway between 271st Avenue and the MPA Boundary
- Improve Sun Valley Parkway to an 8-lane Parkway between Olive Avenue and Southern Avenue
- Improve Turner Parkway to an 8-lane Parkway between Bethany Home Road and I-10
- Improve McDowell Parkway to an 8-lane Parkway between Turner Parkway and Dean Road

- Improve Watson Road to a 6-lane Major Arterial between McDowell Parkway and McDowell Road
- Improve McDowell Road to a 6-lane Major Arterial between Watson Road and McDowell Parkway
- Improve Indian School Road to a 6-lane Major Arterial between Verrado Way and the point where Indian School Road is already classified as a 6-lane Major Arterial between Jackrabbit Trail and Perryville Road

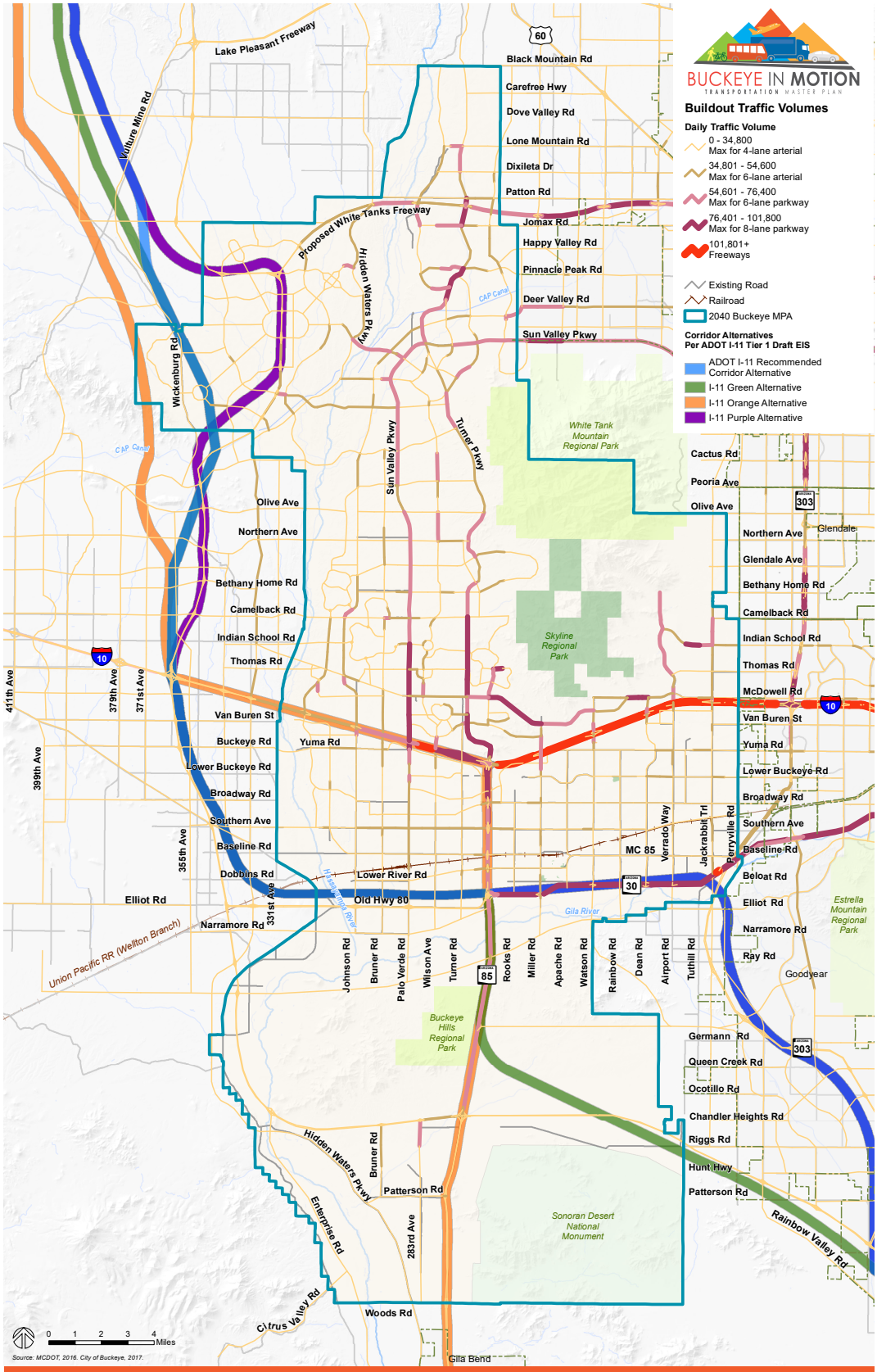
Finally, the areas along Miller Road and Watson Road are both showing LOS "E" and LOS "F" in buildout conditions at the I-10 TIs. The MAG travel demand model does not account for turning volumes or TI configurations. However, the project volumes at these two TIs indicate that more than a 6-lane Major Arterial cross-section may be needed during buildout conditions. These locations were studied as part of the I-10 expansion project and ADOT is proceeding with final design to accommodate the 2040 volumes.

The model results are shown on Figures 2-33 and 2-34.

2.9 Street Network Recommendations

Following the four-travel demand model run scenarios (2014, 2040, Scenario 1, and Scenario 2) the findings of each model run were utilized to determine the ultimate Future Street Network for the Buckeye MPA. Scenario 1 is Buckeye General Plan build out socio-economic data on the MAG 2040 roadway network. Scenario 2 is projected Buckeye General Plan build out socio-economic data on the Hassayampa Valley Framework Study roadway network plus Community Master Plans and MCDOT Parkways. Future Scenario 2 is the model run ultimately used to determine future street network. The roadway network includes HVFS roadway network plus roads from development CMPs and MCDOT Parkway feasibility studies. Any roadway segments that were LOS E or LOS F were upsized to fit projected future traffic volume to determine the ultimate street network.

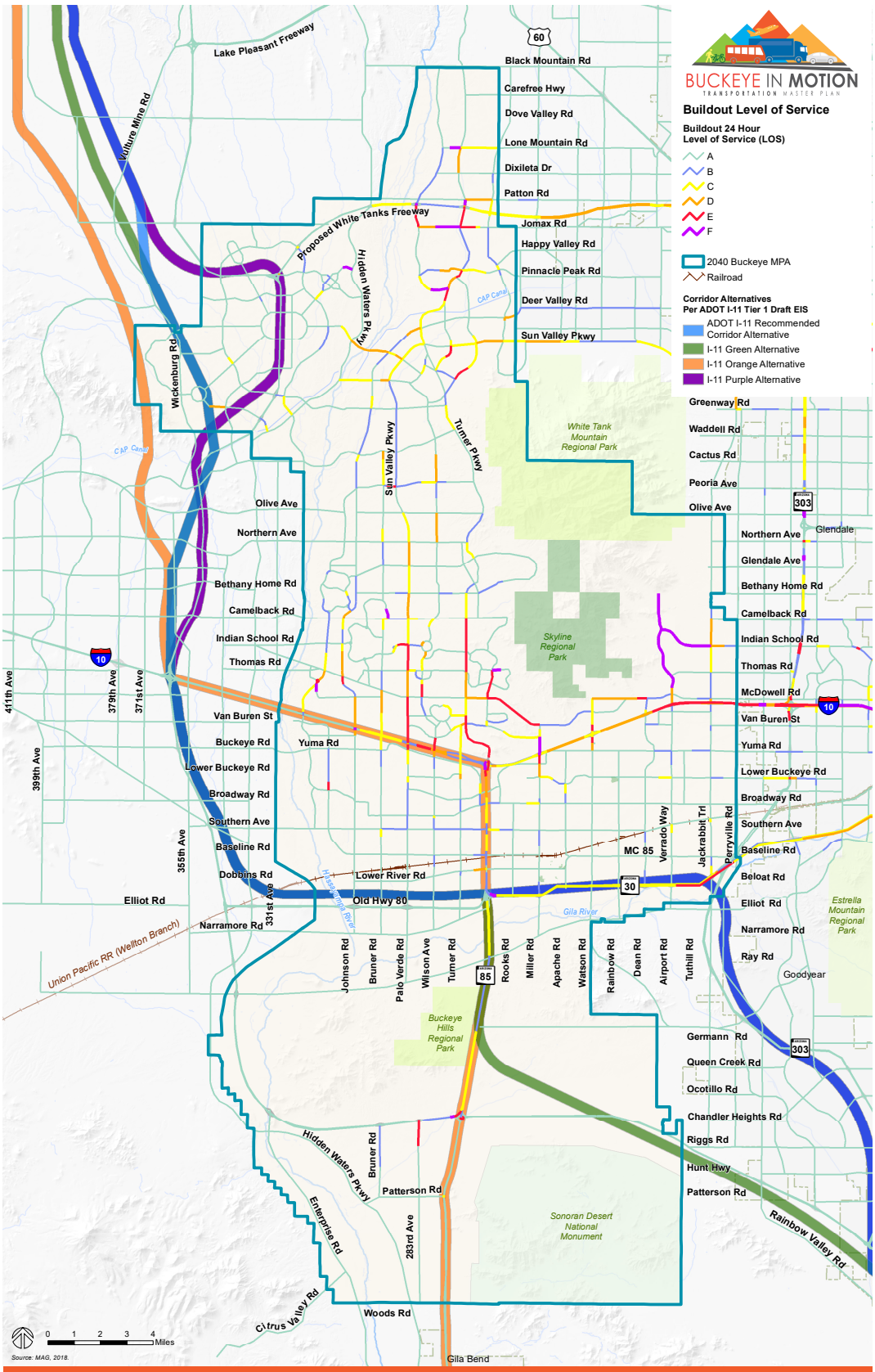
Provided in this section is a description of the Future Street Network including the Street Classifications, Street Configuration, and Jurisdictional Responsibility. Table 2-12 provides a summary of the component of the Future Street Network which is further described in this section.



Matrix DESIGN GROUP

Figure 2-33

Buildout Traffic Volumes on Revised Hassayampa Network



Matrix DESIGN GROUP

Figure 2-34

Buildout Level of Service on Revised Hassayampa Network

Table 2-12: Future Street Network

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
East-West Roadways						
Baseline Road	315th Avenue	SR 85	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Baseline Road	SR 85	Rooks Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Baseline Road	Rooks Road	Miller Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Bell Road	Hidden Waters Parkway	Wilson Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Bethany Home Road	Johnson Road	Turner Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Black Mountain Road	Hidden Waters Parkway	Canyon Springs Boulevard	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Broadway Road	Johnson Road	Rainbow Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Broadway Road	Rainbow Road	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Camelback Road	Hidden Waters Parkway	Sun Valley Parkway	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial
Camelback Road	Sun Valley Parkway	Oglesby Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Camelback Road	Jackrabbit Trail	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Carefree Highway Alignment	Turner Parkway	Canyon Springs Boulevard	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Dixileta Drive	Turner Parkway	243rd Avenue	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Elliot Road	I-11	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Glendale Road	Johnson Road	Turner Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Glendale Road	315th Avenue	Johnson Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Glendale Road	Jackrabbit Trail	Beardsley Canal	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Greenway Parkway	I-11	Turner Parkway	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial
I-10	Hidden Waters Parkway	Perryville Road	Freeway	ADOT	Interstate / Other Freeway and Expressw ay / Urban Principal Arterial	Freeway/ Expressw ay
I-11	MPA boundary	Riggs Road	Freeway	ADOT	Interstate / Other Freeway and Expressw	Freeway/ Expressw ay
Indian School Road	Hidden Waters Parkway	Johnson Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Indian School Road	Johnson Road	Tartesso Parkway	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Indian School Road	Verrado Way	Beardsley Canal	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Indian School Road	Beardsley Canal	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Jomax Road	287th Avenue	243rd Avenue	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Lone Mountain Road	287th Avenue	243rd Avenue	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Loop 303	SR 30	Elliot Road	Freeway	ADOT	Interstate / Other Freeway and Expressway / Urban Principal Arterial	Freeway/ Expressway
Lower Buckeye Road	Palo Verde Road	Turner Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Lower Buckeye Road	Turner Road	Yuma Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Lower Buckeye Road	Westpark Loop	Watson Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Lower Buckeye Road	Watson Road	Rainbow Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Lower Buckeye Road	Rainbow Road	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Lower River Road	Johnson Road	1st Avenue	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
MC 85	Turner Road	SR 85	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
MC 85	SR 85	1st Street	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
MC 85	7th Street	Apache Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
MC 85	Apache Road	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
McDowell Parkway	Hidden Waters Parkway	Dean Road	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial
McDowell Road	Dean Road	Perryville Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Monroe Avenue	1st Street	7th Street	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Narramore Road	Hidden Waters Parkway	SR 85	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Northern Avenue	323rd Avenue	Turner Parkway	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial
Northern Avenue	Jackrabbit Trail	Perryville Road	4 Lane Road	City of Buckeye	Urban Principal Arterial	Major Arterial
Olive Avenue	323rd Avenue	Peoria Avenue	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Olive Avenue	Johnson Road	Turner Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Olive Avenue	Jackrabbit Trail	Perryville Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Patterson Road	Hidden Waters Parkway	Bruner Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Patterson Road	Bruner Road	SR 85	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Patton Road	Hidden Waters Parkway	243rd Avenue	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Pinnacle Peak Road	287th Avenue	243rd Avenue	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Roosevelt Street	211th Ave	Jackrabbit Trail	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Southern Avenue	Hidden Waters Parkway	SR 85	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Southern Avenue	SR 85	Perryville Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
SR 30	I-11	Loop 303	Freeway	ADOT	Interstate / Other Freeway and Expressway / Urban Principal Arterial	Freeway/ Expressway
Tartesso Parkway	Indian School Road	Sun Valley Parkway	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Thomas Road	347th Avenue	McDowell Parkway	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Thomas Road	303rd	Bruner Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Thomas Road	Bruner Road	Turner Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Thomas Road	Verrado Way	Perryville Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Van Buren Street	Jackrabbit Trail	Perryville Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Van Buren Street	Dean Road	Verrado Way	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
White Tanks Freeway	I-11	MPA boundary	Freeway	ADOT	Interstate / Other Freeway and Expressway / Urban Principal Arterial	Freeway/ Expressway
Wintersburg Parkway	Hidden Waters Parkway	Turner Parkway	Parkway	MCDOT/City of Buckeye	Urban Principal Arterial	Major Arterial
Woods Road	Johnson Road	SR 85	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Yuma Parkway	Hidden Waters Parkway	Palo Verde Road	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial
Yuma Road	Palo Verde Road	Broadway Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Yuma Road	Broadway Road	Watson Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Yuma Road	Watson Road	West of Dean Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Yuma Road	West of Dean Road	East of Dean Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Yuma Road	East of Dean Road	Perryville Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
North-South Roadways						
211th Avenue	Roosevelt Street	Van Buren Street	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
271st Avenue	Turner Parkway	North of Sun Valley Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
271st Avenue	North of Sun Valley Parkway	Turner Parkway	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
283rd Avenue	I-11	Woods Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
287th Avenue	Black Mountain Road	Turner Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
303rd Avenue	Tartesso Parkway	McDowell Parkway	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
315th Avenue	Van Buren Street	Broadway Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
315th Avenue	Broadway Road	Southern Avenue	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
319th Avenue	Broadway Road	Southern Avenue	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
323rd Avenue	I-11	Northern Avenue	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
347th Avenue	I-11	Internal Douglas Ranch Road (Unnamed)	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
347th Avenue	Internal Douglas Ranch Road (Unnamed)	Wintersburg Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Apache Road	Yuma Road	Baseline Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Apache Road	MC 85	SR 30	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Bruner Road	Wintersburg Parkway	Peoria Avenue	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Bruner Road	Peoria Avenue	Bethany Home Road	6 Lane Road	MCDOT	Urban Principal Arterial	Major Arterial
Bruner Road	Camelback Road	Tartesso Parkway	6 Lane Road	MCDOT	Urban Principal Arterial	Major Arterial
Bruner Road	Tartesso Parkway	McDowell Parkway	6 Lane Road	City of Buckeye	Urban Principal Arterial	Major Arterial
Bruner Road	McDowell Parkway	Elliot Road	6 Lane Road	MCDOT	Urban Principal Arterial	Major Arterial
Bruner Road	I-11	Patterson Road	6 Lane Road	MCDOT	Urban Principal Arterial	Major Arterial
Canyon Springs Boulevard	Lone Mountain Road	Sun Valley Parkway	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Dean Road	McDowell Parkway	Van Buren Street	Parkway	City of Buckeye	Urban Principal Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Dean Road	Van Buren Street	Yuma Road	6 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Dean Road	Yuma Road	Roosevelt Irrigation District Canal Service Road	4 Lane Road	City of Buckeye	Urban Minor Arterial	Major Arterial
Dean Road	Roosevelt Irrigation District Canal Service Road	SR 30	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Desert Oasis Boulevard	Turner Parkway	Wilson Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Happy Valley Road	Canyon Springs Boulevard	MPA Boundary	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Hidden Waters Parkway	Patton Road	Wintersburg Parkway	Parkway	Municipal	Urban Principal Arterial	Major Arterial
Hidden Waters Parkways	MPA boundary	Woods Road	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Jackrabbit Trail	Olive Street	Van Buren Street	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Jackrabbit Trail	Van Buren Street	Durango Street	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Jackrabbit Trail	Durango Street	Loop 303	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Johnson Road	Desert Oasis Boulevard	Greenway Parkway	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Johnson Road	Greenway Parkway	Wintersburg Parkway	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Johnson Road	Wintersburg Parkway	Indian School Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Johnson Road	Indian School Road	Thomas Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Johnson Road	Thomas Road	Elliot Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Johnson Road	I-11	Woods Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Miller Road	McDowell Parkway	Narramore Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Palo Verde Road	I-10	Yuma Road	Parkway	Municipal	Urban Principal Arterial	Major Arterial
Palo Verde Road	Yuma Road	SR 30	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Palo Verde Road	SR 30	Elliot Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Palo Verde Road	I-11	Unnamed dirt road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Peoria Avenue	Turner Parkway	Johnson Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Perryville Road	Camelback Road	Indian School Road	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Perryville Road	Indian School Road	Broadway Road	Parkway	Municipal	Urban Principal Arterial	Major Arterial
Perryville Road	Broadway Road	SR 30	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Rainbow Road	Yuma Road	Southern Road	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Rainbow Road	Southern Road	Elliot Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Rooks Road	Broadway Road	SR 30	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
SR 85	I-10	Woods Road	Freeway	ADOT	Interstate / Other Freeway and Expressway / Urban Principal Arterial	Freeway / Expressway
Sun Valley Parkway	243rd Avenue	I-10	Parkway	MCDOT	Urban Principal Arterial	Major Arterial
Turner Parkway	Black Mountain Road	I-10	Parkway	Municipal	Urban Principal Arterial	Major Arterial
Turner Road	Van Buren Street	Broadway Road	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Turner Road	Broadway Road	Unnamed dirt road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Turner Road	Unnamed dirt road	Buckeye Canal Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Turner Road	Buckeye Canal Road	Narramore Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Tuthill Road	SR 30	Elliot Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Verrado Way	Indian School Road	McDowell Road	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Verrado Way	McDowell Road	Yuma Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Verrado Way	Yuma Road	Elliot Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Watson Road	McDowell Road	McDowell Parkway	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Watson Road	McDowell Parkway	SR 30	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial

Table 2-12: Future Street Network (continued)

Road Name	From	To	Street Configuration (No. of Lanes in Each Direction)	Jurisdictional Responsibility	ADOT Functional Classification	MAG Facility Type
Watson Road	SR 30	Elliot Road	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Wickenburg Road	South of Vulture Mine Road	North of Union Hills Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Wickenburg Road	North of Union Hills Road	MPA boundary	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Wilson Road	Bell Road	I-10	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Wilson Road	I-10	Broadway Road	6 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Wilson Road	Broadway Road	Lower River Road	4 Lane Road	Municipal	Urban Minor Arterial	Major Arterial
Wilson Road	Lower River Road	Hazen Road	4 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial
Wilson Road	Hazen Road	Narramore Road	6 Lane Road	MCDOT	Urban Minor Arterial	Major Arterial

Future Street Classifications

As described in Section 2.2 of this chapter, street classifications indicate the function of mobility and access on a roadway. Mobility is the movement from place to place while access is the ingress and egress to adjacent land. The Future Street Network in Buckeye will include Freeways/Expressways, Parkways, Major Arterial streets, Arterial streets, and a supporting network of Collector and Local streets as described in the following subsections.

Figure 2-35 displays the Future Street Network by City Street Classification. Notably, Collector and Local streets are not identified in this map and are typically laid out through development review processes with Community Master Plans. **Figure 2-36** displays the Future Street Network by MAG facility type. **Figure 2-37** displays the Future Street Network by ADOT functional classification.

Freeway and Expressway

In the future street network, the freeways and expressways in Buckeye consist of I-10, SR 85, and the future I-11, SR 30, and White Tanks Freeway. Additionally, just outside the Buckeye MPA is the existing SR 303 and the future Lake Pleasant Freeway. Each of these freeways are regionally- and nationally-significant routes for the movement of goods and people. The MAG Facility Type for these corridors are Freeway/Expressway, whereas the ADOT Functional Classification includes interstate, other freeway and expressway, and urban principal arterial.

Parkways

In the future street network, the Parkways in Buckeye consist of Turner Parkway, Sun Valley Parkway, Hidden Waters Parkway, Greenway Parkway, McDowell Parkway, Southern Parkway, Wintersburg Parkway, Yuma Parkway, Camelback Parkway (west of Sun Valley Parkway), and Northern Avenue (west of Turner Parkway). Additionally, just outside the Buckeye MPA are the following Parkways: Bell Parkway, Tonopah Parkway, Wildrose Parkway and Sonoran Parkway. Each of these Parkways are regionally-significant corridors whose primary purpose is the fluid movement of people and goods. The MAG Facility Type for these Parkways is Major Arterial and the ADOT Functional Classification is Urban Principal Arterial.

Major Arterial Streets

In the future street network the Major Arterial streets in Buckeye include Baseline Road, Bethany Home Road, Camelback Road, Dixileta Drive, Elliot Road, MC 85, McDowell Road, Monroe Avenue, Olive Avenue, Patton Road, Watson Road, Woods Road, 283rd Avenue, 287th Avenue, 323rd Avenue, Bruner Road, Canyon Springs Boulevard, Desert Oasis Boulevard, Jackrabbit Trail, Miller Road, and Perryville Road. Each of these Major Arterial Streets are meant to both serve mobility needs of vehicles and also the safe movement of pedestrians, bicycles, freight, and transit vehicles. The MAG Facility Type for Major Arterial streets is Major Arterial and the ADOT Functional Classification is Urban Minor Arterial.

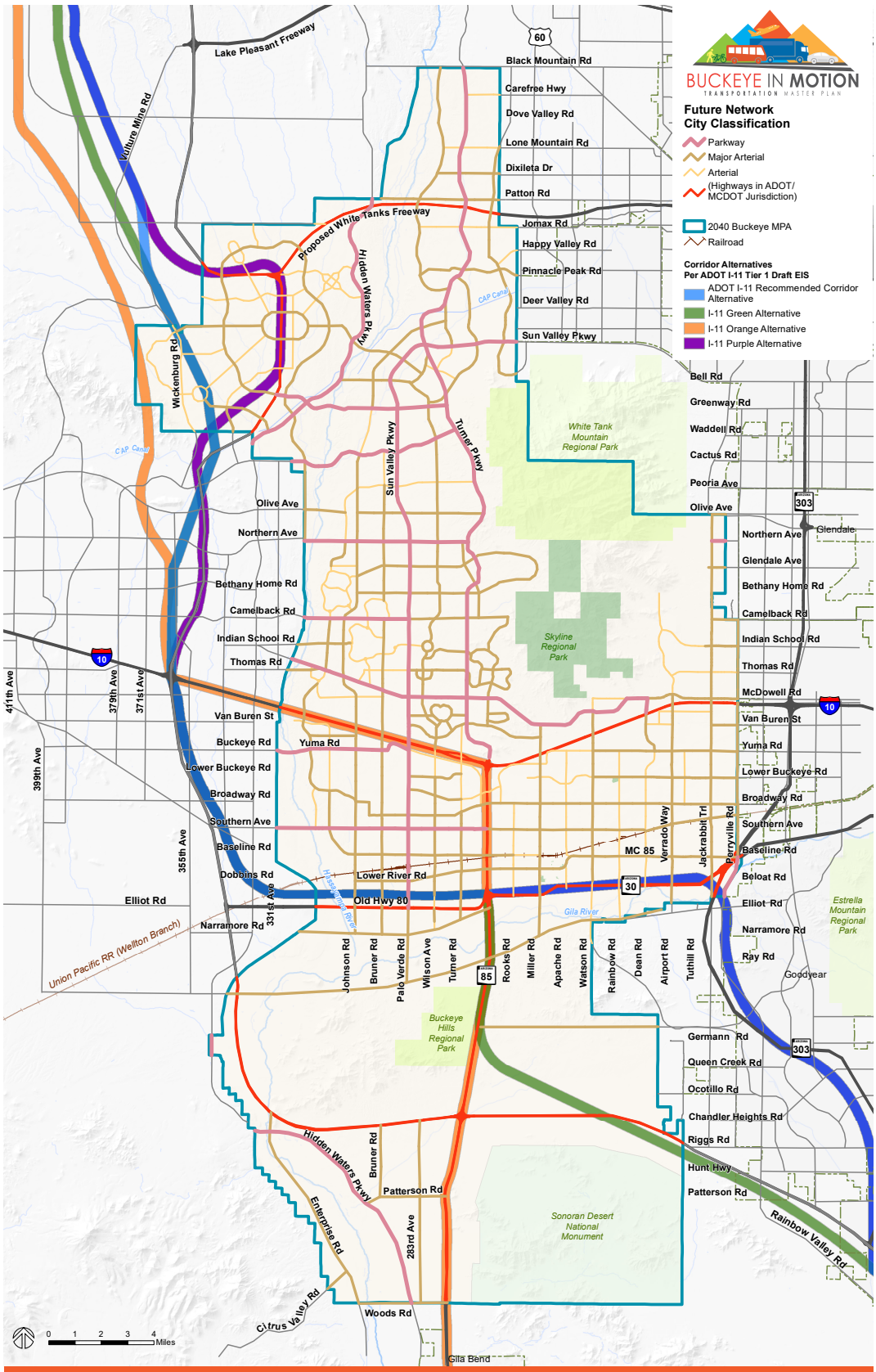


Figure 2-35
Future Street Network by City Classification

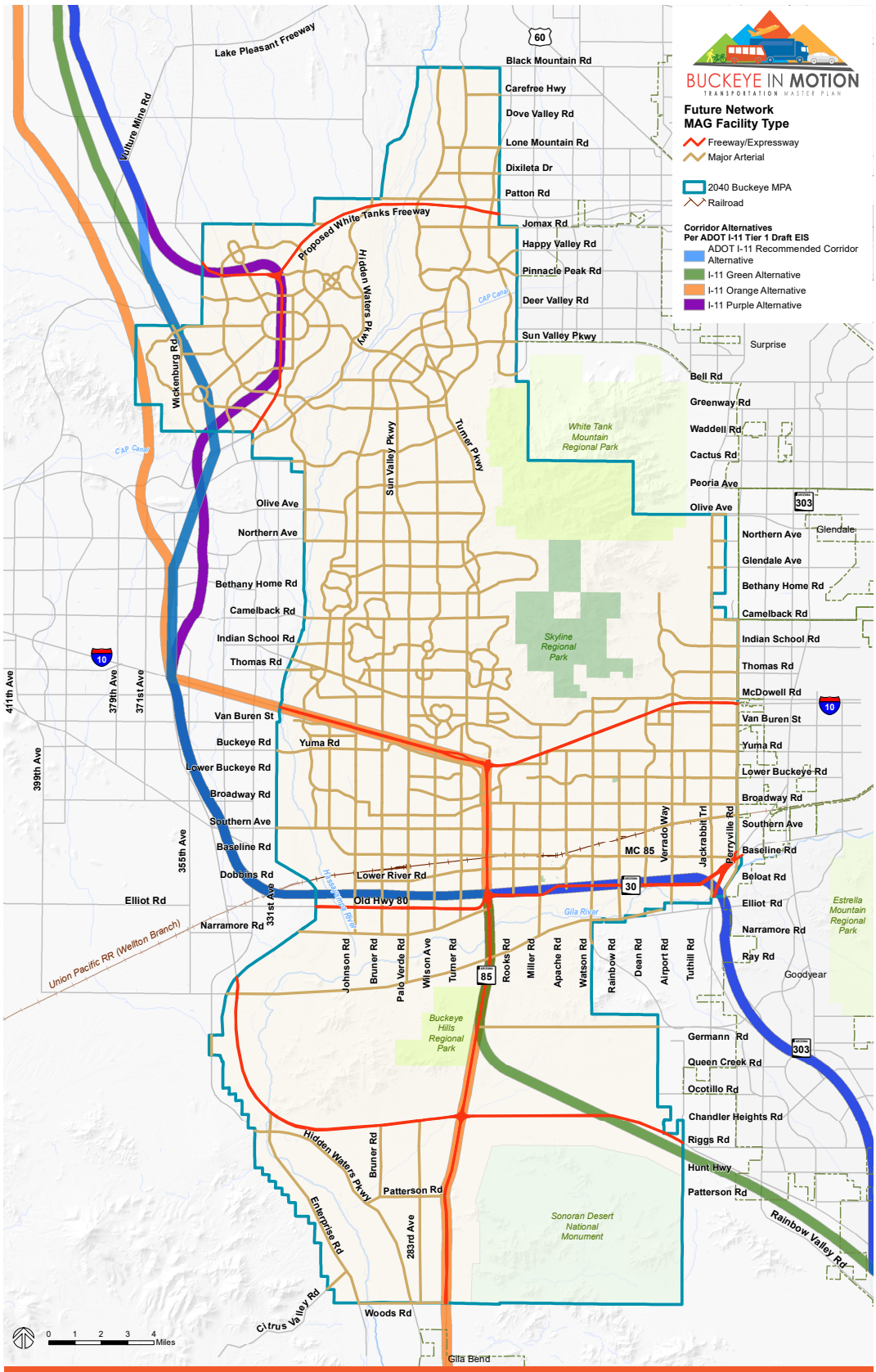


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Figure 2-36

Future Street Network by MAG Facility Type

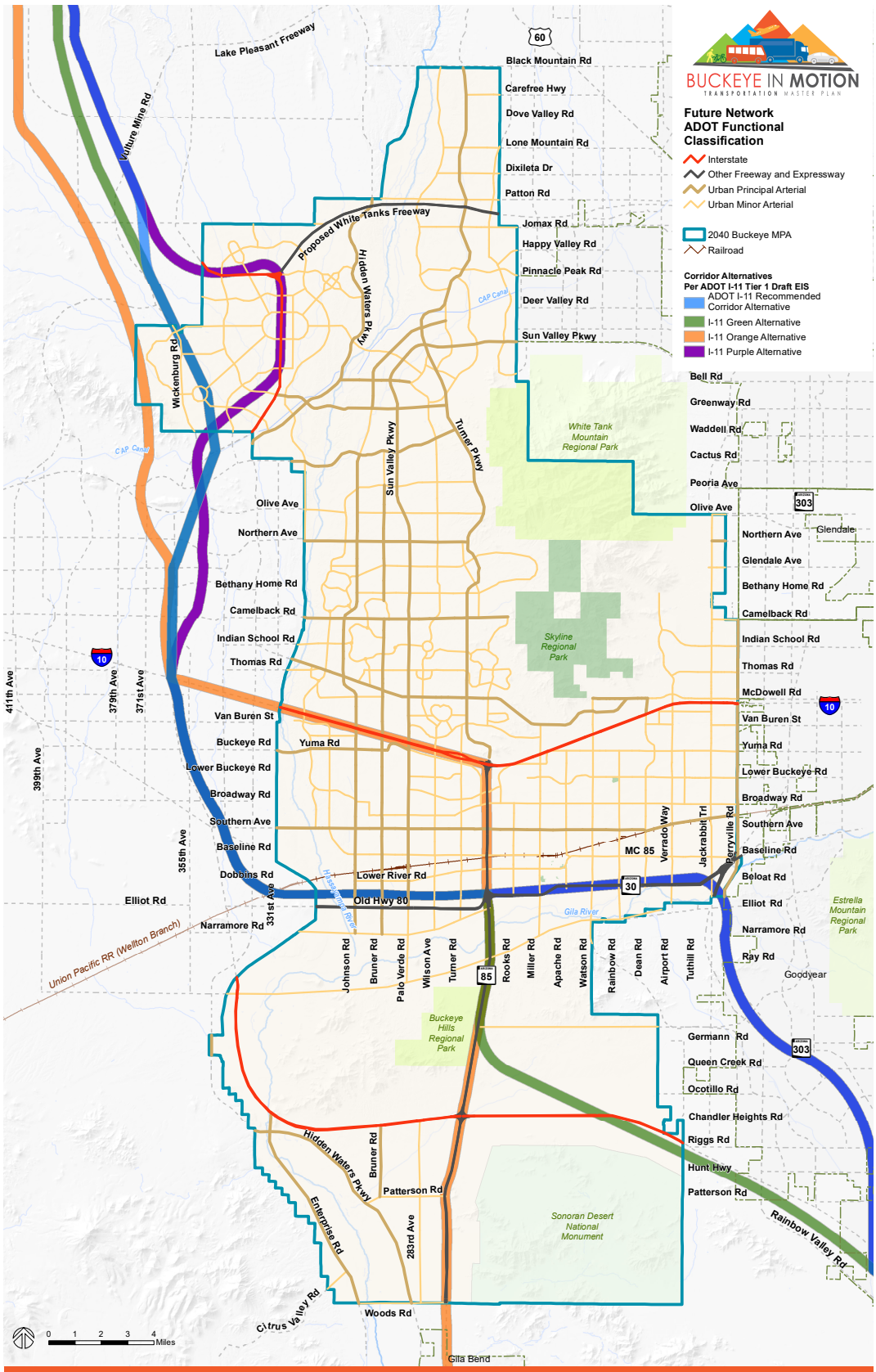

Figure 2-37
Future Street Network by ADOT Functional Classification

Arterial Streets

In the future street network, the Arterial streets in Buckeye include Jomax Road, Lone Mountain Road, Roosevelt Street, Tartesso Parkway, 211th Avenue, 303rd Avenue, 315th Avenue, 319th Avenue, Apache Road, Dean Road, Happy Valley Road, Lower Buckeye Road, Peoria Avenue, Rainbow Road, Turner Road, Tuthill Road, and Wickenburg Road. Each of these Arterial Streets are meant to both serve mobility needs of vehicles and also the safe movement of pedestrians, bicycles, freight, and transit vehicles. The MAG Facility Type for Arterial streets is Major Arterial and the ADOT Functional Classification is Urban Minor Arterial.

Collector Streets

Collector streets (one through lane in each direction) are not identified in **Figure 2-35**. Collector streets are intended to be at quarter-mile spacing and are typically laid out through the development review process of Community Master Plans. Collector streets provide a redundant route for Arterial streets especially in instances of construction re-routing and emergency re-routing. Furthermore, due to their lower posted speeds, Collector streets are intended to serve as the spine of the bicycle and pedestrian network. Therefore, collectors must connect to each other from one development to the next at the quarter mile mark. These points are expanded upon in Section 2.7 of this Chapter.

The City of Buckeye has three types of Collector streets: Major Collector, Commercial Collector, and Collector. Each of these typologies is described in Section 2.6 of this Chapter. The MAG Facility Type for Major Collector, Commercial Collector, and Collector street is Collector and the ADOT Functional Classification is Urban Collector.

Local Streets

Local streets are not identified in **Figure 2-35**. Local streets provide direct access to abutting land uses, provide access to collector street system, as well as accommodate low traffic volumes. Local streets are designed to discourage high travel speeds and are not intended for through traffic.

The City of Buckeye has two typologies of Local streets: Major Local and Local. Each of these typologies is described in Section 2.6 of this Chapter. MAG does not define a Facility Type for Major Local and Local street; however, the ADOT Functional Classification is Urban Local Street.

Future Street Configuration

Each of the Future Street Classifications previously described have an assumed lane configuration. At the time of design for each of these streets, the ultimate lane configuration may change from what is described in this section. **Table 2-13** lists the number of lanes for each street classification. **Figure 2-38** illustrates the lane configuration for each of the roadways that make up the future street network.

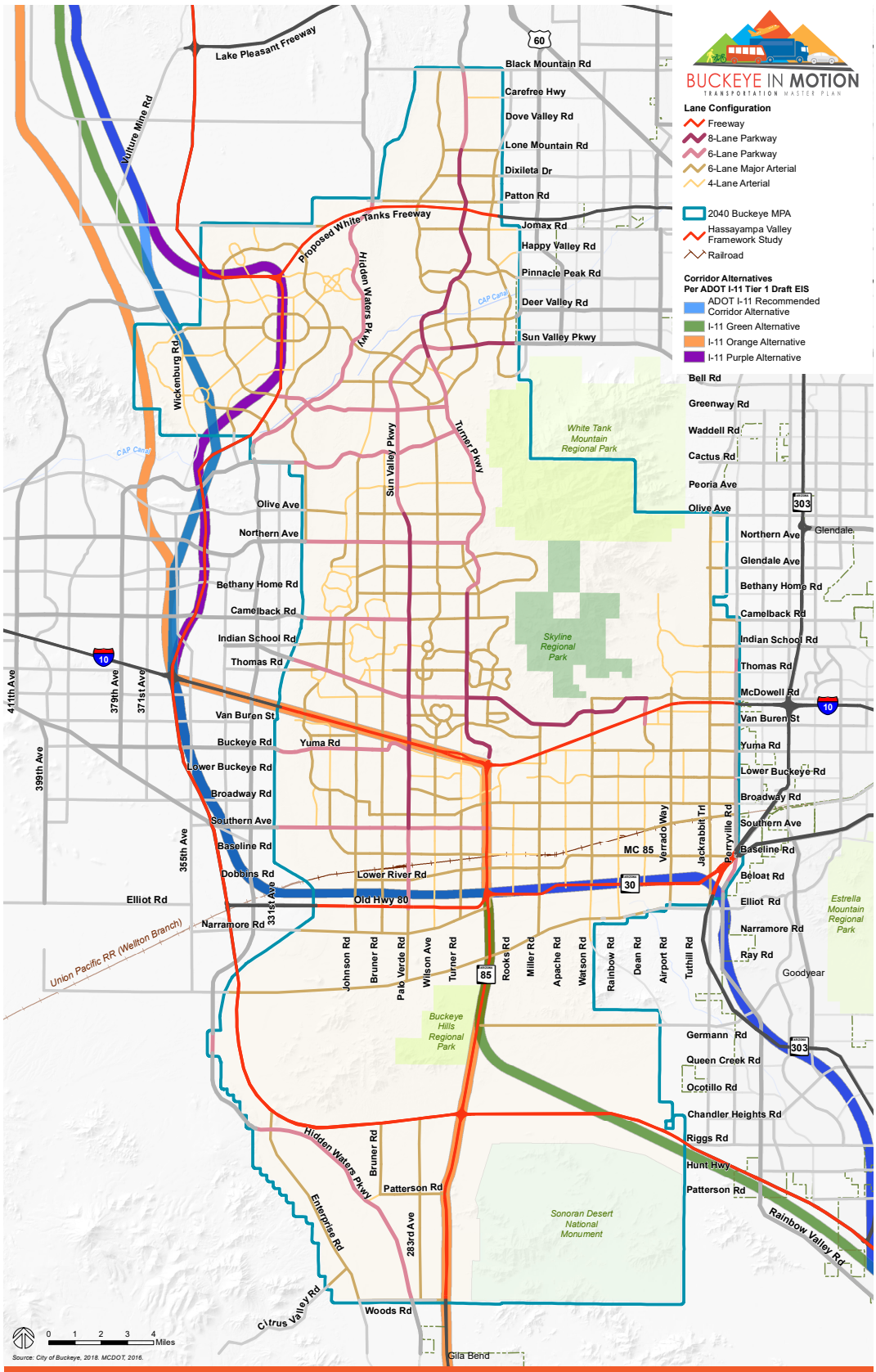

Figure 2-38
Future Street Network

Table 2-13: Lane Configuration by City Street Classification

Classification	No. of Vehicle Lanes	Bicycle Lanes	Median
Parkway	8, 6, or 4	Yes	Yes
Major Arterial	6	Yes	Yes
Arterial	4	Yes	Yes
Major Collector	4	Yes	Yes
Commercial Collector	3	Yes	Two-way left turn lane
Collector	2	Yes	Yes
Major Local	2	No	No
Local	2	No	No

Source: Engineering Design Standards, City of Buckeye, 2012.

Future Jurisdictional Responsibility

Large portions of the City's future street network will be constructed by developers. However, once the network is built, the City will be responsible to operate and maintain a vast street network including all infrastructure within street rights-of-way, with the exception of private utilities, landscaping back of curb. In some cases, Street Light Improvement Districts (SLID's) have been formed to provide for operational costs associated with street lights. Maintaining streets and drainage systems is a significant cost for all municipal governments affecting the costs of operations and maintenance (O&M) of the transportation system. The ongoing maintenance of the street transportation network will be paid by three agencies: City of Buckeye, MCDOT, and ADOT. Figure 2-39 illustrates the jurisdictional responsibility for each of the roadways in the future street network.

As developments occur within the Buckeye MPA, the City will be approached by land owners to consider annexation of their property to provide valuable municipal services. Expansion of municipal services following annexations includes the potential inheritance of already built, MCDOT-maintained streets. According to the *2014 Buckeye Roadway Annexation Policy* (Policy), as the City continues to grow and expand the City will annex roadways when it is in the best interest of the City to do so. The Policy indicates several potential reasons for roadway annexation including economic development, adjacent annexations, or improvements or other potential reasons that would benefit the City, pending available funding. The City's Policy provides a strategic process for assessing when roadway annexation should occur and the processes by which to conduct roadway annexations.

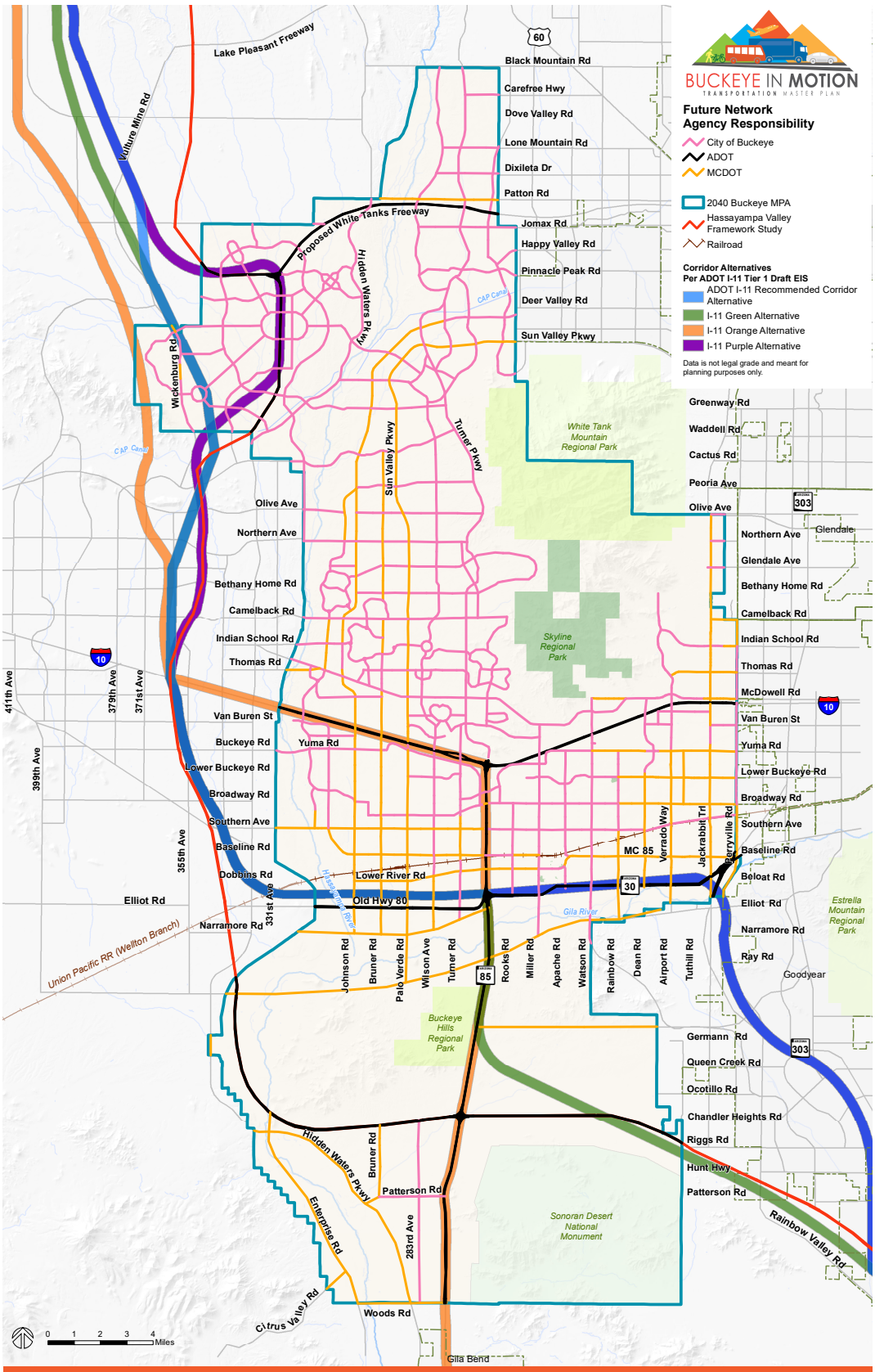

Figure 2-39
Future Street Network by Agency Responsibility

2.10 Street Implementation and Funding

Implementation and funding for the future street network is identified for the buildout street network in this section. Although implementation and funding is for the buildout network, there are interim priorities for street projects in Buckeye that are identified through the CIP, RTP, and 2040 MAG model run. These studies and model run were used to identify priorities for the street projects.

Funding

There are funding sources at the City, state, regional, and federal level to assist in the implementation of street projects. At the city level, the City requires Traffic Impact Assessments (TIAs) for new developments. Developers are required to install their half-street improvements based on build out and must dedicate full right-of-way. TIAs are used to determine if additional requirements are necessary such as left turn queue lengths, etc. which allows for spot improvements to the transportation system when developments generate increased traffic. These spot improvements can cause important network issues including half-built or "scalloped" streets that create pinch points in network fluidity, as well as intersections with misalignments creating potentially unsafe conditions. In addition to TIAs, the City programs roadway capital improvement projects as needs warrant such improvements and when the City's budget allows for these projects to be implemented.

Regionally, the MAG Arterial Life Cycle Program (ALCP), which is currently funded through Proposition 400 (half-cent sales tax that currently expires in 2025), provides funding for appropriate surface transportation facilities that qualify under this program. In addition, the Regional Transportation Plan (RTP) allocates federal Surface Transportation Block Grant Program – MAG Funds (STBGP-MAG) and federal Congestion Mitigation and Air Quality Improvement Program Funds (CMAQ) to fund projects in the ALCP.

On the state level, the Highway User Revenue Fund (HURF), which is a combination of fuel tax revenue and vehicle license tax (VLT), provides funding that can be used by State and local agencies to improve highways, bridges, tunnels, pedestrian and bicycle infrastructure, and transit projects.

At the federal level, the Transportation Authorization Bill (FAST Act) provides long-term funding for surface transportation infrastructure planning and investment, authorizing $305 billion for the entire U.S. over a five-year period (FY 2016 through FY 2020). Funding is available for highway, motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. Included in the Federal Funding Program is the Highway Safety Improvement Program (HSIP), an aid program with the purpose of reducing traffic fatalities and serious injuries on all public roads. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads.

Implementation

The Future Street Network will be built over time. Short-term recommendations include improvements identified in the City Capital Improvements Program (CIP), MCDOT Transportation Improvement Program (TIP) and the MAG Regional Transportation Plan (RTP) and include projects in the first five years following the TMP. Mid-term recommendations include improvements anticipated to be needed by 2040, resulting from the travel demand modeling efforts described in Section 2.8 of this Chapter. Long-term recommendations include improvements anticipated to be needed after 2040. These recommendations and the planning-level costs and other implementation actions associated with these improvements are included in Chapter 9 Implementation.

2.11 Summary

This chapter provided an overview of the analysis leading to the future street network recommendations. Ultimately, this chapter provides a foundation for all chapters that follow as the street network is a vital part of the operation of all modes of travel in a transportation network. The street network serves multiple purposes including the movement of personal vehicles, freight, transit vehicles, bicyclists, and pedestrians as well as providing access to the airport or across railways. Furthermore, the City's ITS network is a supporting component of the street network to ensure all of the modes interact in a safe and efficient manner. In addition to laying out the future street network, this chapter includes guidance on the importance of establishing mode priorities on roadways and the importance of creating network redundancy with a connected local and collector roadway network. This chapter concluded with the identification of funding sources and implementation guideline for the future street network.

3.1 Introduction

Transit is an integral component of local and regional connectivity as it provides an alternative means of transportation for residents and visitors, eases commute and transportation needs, and increases accessibility. Additionally, an affordable and efficient transit system that meets the needs of all ages and abilities is crucial to the success of the overall transportation network. This chapter provides a recommended long-range plan of action for transit services as Buckeye continues to grow and develop.

Transit has historically been an exclusively government-funded transportation service. In recent years private industry has showed increasing interest in public transit including private rideshare and ride hail services and public-private partnership of high capacity transit services. In Buckeye, public transit may continue to be a government-funded service, including a combination of City and Federal funding sources. Due to this, efforts will be made at the City to maximize the cost-benefit of transit.

This long-range plan for transit service includes identification of existing bus stop locations, existing and future transit service types, and existing and future park-n-ride locations that facilitate transportation options for a growing commuter population within Buckeye and in the greater Phoenix region. Continued collaboration with regional partners, such as MAG and Valley Metro, and adjacent jurisdictions will increase such opportunities for visitors to reach key destinations in Buckeye. Valley Metro is a regional public transportation agency providing transit services for the greater Phoenix metropolitan area, including Buckeye.

Although transit has become largely the responsibility of the City, continued partnerships will be needed. Additionally, this plan considers private transit operations in the form of rideshare and ride hail programs. The City may need to consider partnering with private companies to expand rideshare programs into the city.

Included in this Transit Chapter are the following sections:

- Section 3.1 **Introduction**, providing an analysis of the Transit Chapter purpose and contents.
- Section 3.2 **Existing Transit Services**, providing an overview of the transit-related infrastructure and transit services that exist in the City of Buckeye.
- Section 3.3 **Imagine Buckeye 2040 General Plan.** Transit related Goals and Policies of the General Plan.
- Section 3.4 **Multimodal Integration.** Overview of transit integration in the transportation network.
- Section 3.5 **Relevant Local and Regional Transit Plans.** Relevant previous plans and studies that include recommendations for Transit within the City.
- Section 3.6 **Factors Influencing Transit Demand.** Factors that create demand for transit.
- Section 3.7 **Services and Route Recommendations.** Recommendations for future transit services and future transit routes.
- Section 3.8 **Transit Stop Recommendations.** Recommendations for transit stops including park-n-ride locations and local bus stops.
- Section 3.9 **Transit Implementation and Funding.** Description of implementation and potential funding sources for transit recommendations.
- Section 3.10 **Summary.** Summary of the Transit Chapter.

3.2 Existing Transit Services

Existing transit services in Buckeye consist of scheduled, fixed-route bus service and a vanpool program that originate and end outside the city limits. There are currently two Valley Metro transit routes that serve Buckeye – Route 563 and Route 685. Existing transit routes are shown on Figure 3-1.

Regional Route 563

Route 563 is a "Rapid Bus" route that provides commuter service to downtown Phoenix through I-10. Although there is connectivity to downtown Phoenix, service into Buckeye currently ends at the park-n-ride facility located at the intersection of Jackrabbit Trail and McDowell Road. The park-n-ride facility includes 330 parking spaces for vehicles, 80 of which are covered, and bus bays to accommodate buses on Route 563.

Park-n-ride on Jackrabbit Trail and McDowell Road
Source: Serbin Studios.

Regional Route 685

Route 685 provides service to Buckeye and beyond. The "Long Trip" service extends outside Buckeye connecting to the Desert Sky Transit Center in Phoenix and the Ajo Transportation Office in Ajo. While Route 685 runs in both an east-west and north-south direction, service is primarily limited to the area south of I-10 and east of SR 85 in Buckeye.

Valley Metro Rural Route, Route 685 Bus
Source: Buckeye Transit Plan, Valley Metro, 2016.

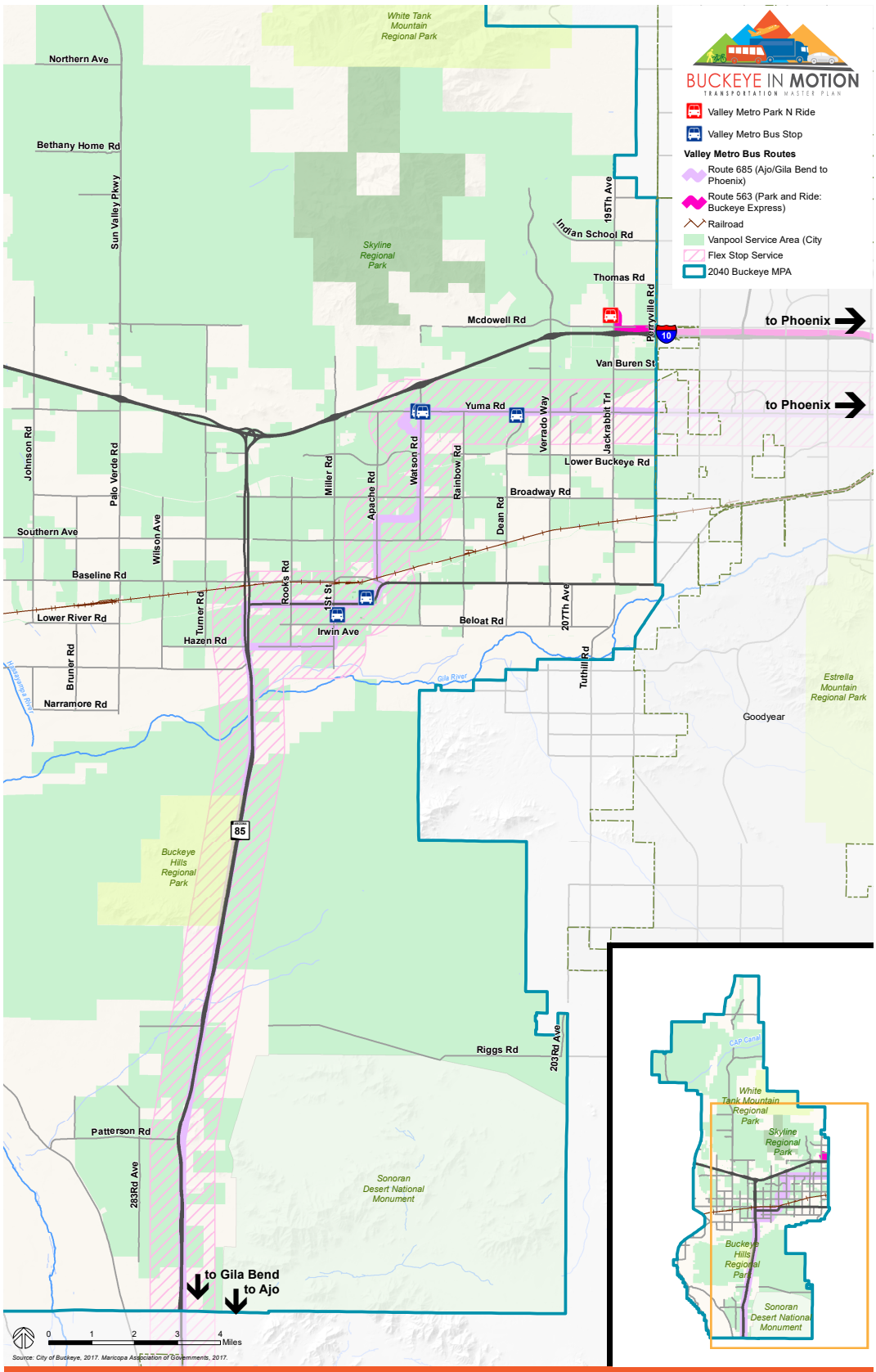

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Figure 3-1
Existing Transit Service

Local Route 685 Circulator

The Local Route 685 is the only local transit route serving Buckeye. The "Short Trip" service consists of a circulator trip offered Monday through Friday. The route follows the Regional Route 685 route, but then circles into the downtown area, providing connections to the Buckeye Downtown Library and the Dr. Saide Recreation Center. In addition to fixed route service, Route 685 provides a demand response service where customers can request an off-route pick up within a 3/4-mile distance from the fixed route service.

Table 3-1: Existing Bus Stops

Route	Stop Location
685	Dean Road at Yuma Road and Dean Road (Stop #17499)
685	Dean Road at Yuma Road and Dean Road (Stop #17500)
685	9th Street and Eason Avenue
685	Buckeye Community Center (Stop #17115)
563	Buckeye Park N Ride (Stop #18326)

Source: Valley Metro

The existing bus stops for Route 685 and 563 are listed in **Table 3-1.**

Ride Hail and Rideshare

Growing populations and demand for increased connectivity have made private transit services an integral part of the transit network, ride hail services refer to programs that require "hailing" or waving down a vehicle, usually a taxicab or shuttle service, while the vehicle is driving around the city. There are many taxis that extend services in Buckeye, such as Discount Cab and VIP Taxi.

In addition to ride hail providers, there are also rideshare services available in Buckeye. Rideshares refer to programs that require a customer to use a cell phone application to call or schedule a ride. Examples of private rideshares that are used in Buckeye are Uber and Lyft.

3.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan, adopted in 2018, identified transit-related policies, which were developed through an extensive public input process. These policies have been developed into implementation strategies for action in this Transit Chapter.

The Imagine Buckeye 2040 General Plan establishes broad policy direction relative to the expansion of transit services in Buckeye, including: providing local transit service to activity centers, providing multimodal accessibility improvements that support transit stop locations, supporting regional transportation opportunities (high-capacity transit), integrating transit service with regional and adjacent local service, and encouraging transit ridership where demand will occur including providing options for elderly and special needs residents. Each of these policy recommendations are further explored in this chapter and are addressed in the Service and Route Recommendations (Section 3.7) and the Transit Stop Recommendations (Section 3.8). These relevant policies include:

- **Goal S-9** Buckeye is a connected community with an efficient multimodal transportation system.
  - **Policy S-9.4** The City of Buckeye should design roads for multimodal accessibility, including transit, bicycles, and pedestrians.
  - **Policy S-9.6** The City of Buckeye should ensure that transit options are provided to Activity Centers and other destination locations.
- **Goal S-12** Buckeye's multimodal system provides alternatives for modes of travel.
  - **Policy S-12.1** The City of Buckeye should integrate the regional transit system with the local Buckeye circulator services.
  - **Policy S-12.2** The City of Buckeye should continue to work with transit agencies and surrounding jurisdictions for expanded transit services.
  - **Policy S-12.4** The City of Buckeye should promote and encourage community-wide transit ridership.
  - **Policy S-12.5** The City of Buckeye should continue to provide transportation options for the elderly and special needs residents.
    - **Action 41.** Expand City-wide transit circulator service. (Long Term)
    - **Action 45.** Extend Valley Metro service to Buckeye Municipal Airport. (Long Term)

To create a transit system that works with the character of the city, it is important to identify land uses that are compatible with transit. For local circulators and vanpool programs, residential land uses, such as rural, neighborhood, and community master plan, are compatible to support ridership. Because residents will be using these programs to reach destinations, other land uses that would be compatible with these programs include business commerce, employment, and open space. Additionally, Activity Centers, which are areas of dense and mixed-use development, generally provide the ridership to support transit service.

3.4 Multimodal Integration

Transit is an integral part of the multimodal network in Buckeye. Transit services are used by every-day commuters for accessing jobs or destinations, such as Activity Centers. The Local Bus Recommendations identified in this Transit Chapter utilize arterial and parkway corridors and connect the planned Activity Centers identified in the Imagine Buckeye 2040 General Plan. In general, arterials and parkways should have vehicle priority to carry traffic to the adjacent areas of an Activity Center. Once in the Activity Center, the priority could change to bicycle and pedestrian access.

Although bicycle and pedestrian uses will occur within Activity Centers, facilities for both bicycles and pedestrians may be prevalent on or along the roadway. This makes it necessary to have streets that have the capacity to be shared by multiple modes of transportation, including buses. This may include the use of appropriate bicycle lanes, road striping, and/or bus bays. In addition, having a well-coordinated ITS system will be important in maintaining safety near transit stops.

Transit is also used as a method for connecting other forms of transportation. This may include transporting travelers to the airport, to commuter rail stops, or to trails. To provide an integrated transportation network for commuters, there should be local transit stops at destinations as well as other high capacity transportation stops. This would include stops to commuter rail terminals and the Buckeye Regional Airport. While the existing transit system includes routes on highways, this will need to be expanded to other roadways to provide connectivity within the whole Buckeye community.

3.5 Relevant Local and Regional Transit Plans

Several previous transit studies have been conducted for the Buckeye area. Some studies provide short-range transit recommendations while others provide long-range transit recommendations. MAG, the regional planning agency for the Phoenix metropolitan area, and Valley Metro (the regional transit service provider for the Phoenix metropolitan area) have conducted several transit studies that provide a foundation for the recommended transit system within Buckeye.

2016 Buckeye Transit Plan

In conjunction with the City of Buckeye, Valley Metro developed the Buckeye Transit Plan in 2016 to guide short-, mid-, and long-term transit services and transit capital investments in Buckeye. The plan provides an overview of existing transit services in Buckeye and expands upon service recommendations in the Southwest Valley Local Transit System Study (SWVLTSS), conducted by MAG in 2013. The Plan recommendations are divided into short-term, mid-term, and long-term actions, focusing on service expansion for areas south of I-10 and east of SR 85.

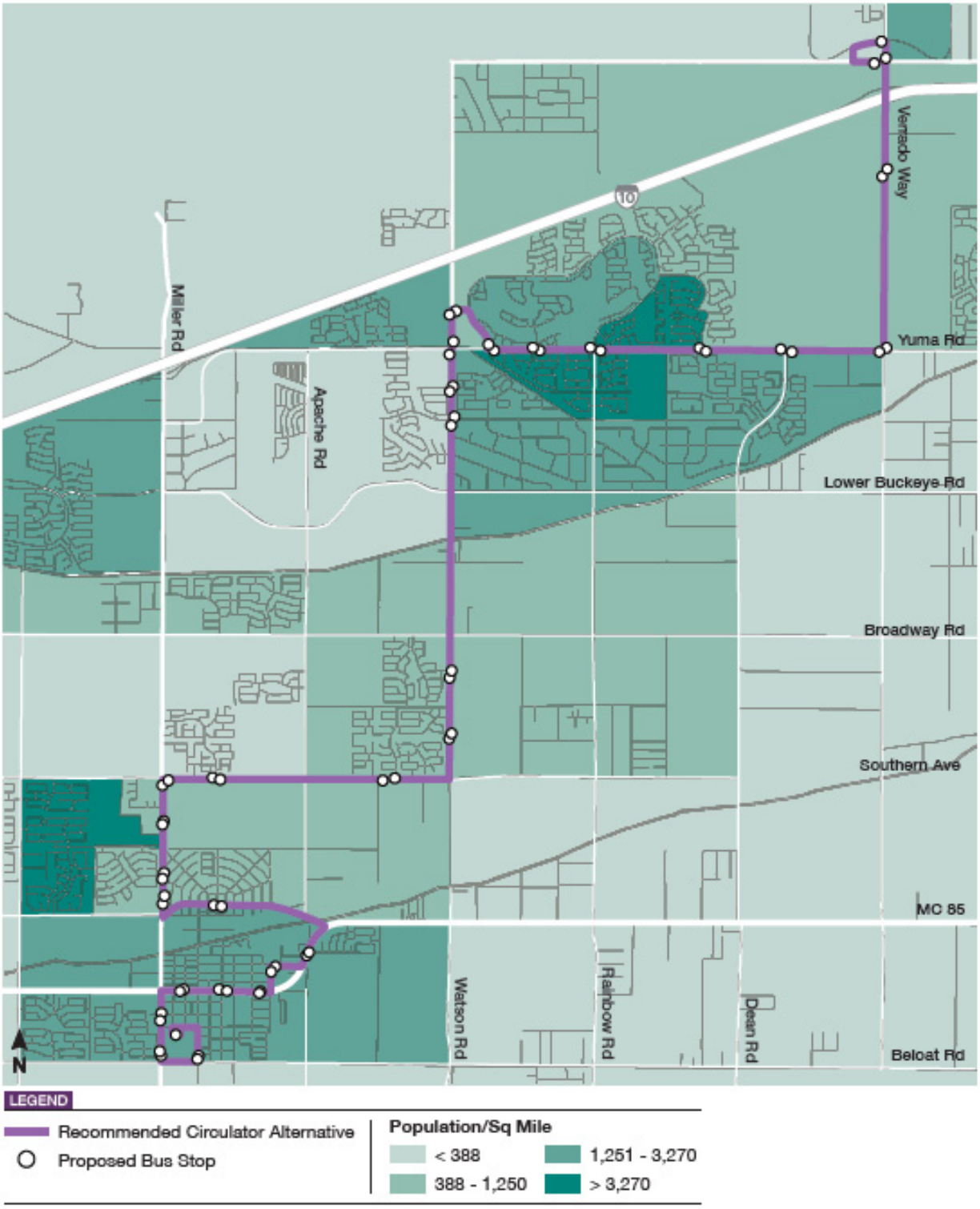
Short-Term Service Recommendations

Technical analysis determined that the future conditions in Buckeye would not likely support bus route extensions by 2030; however, the plan does support the continued operation of Local Route 685, an existing circulator service in Buckeye. The 2016 Buckeye Transit Plan includes short-term recommendations including providing additional trips on Route 563 (the regional commuter service) and providing a flex service to support service needs for locations outside the existing transit service area. Flex services are services that incorporate elements of demand-responsive and fixed-route models and are used in areas that are challenging to serve, including areas with low population and employment densities, dispersed travel patterns, and discontinuous street networks. Additionally, the Plan recommends the continued promotion of Valley Metro's Carpool and Vanpool program which the City of Buckeye currently supports.

Mid-Term Service Recommendations

The mid-term service recommendation includes the implementation of a circulator service in Buckeye. The recommended route for the circulator alternative provides connection between Riverside Apartments and Banner Health Center and the areas in between, including Downtown Buckeye. The route originates near Miller Road and Beloat Road/Lower River Road, traveling along MC 85, Southern Avenue, Yuma Road, and Verrado Way before terminating at McDowell Road. Figure 3-2 illustrates the proposed route and bus stop locations for the recommended circulator alternative from the Buckeye Transit Plan.

Figure 3-2: Recommended Circulator Alternative with Stop Locations

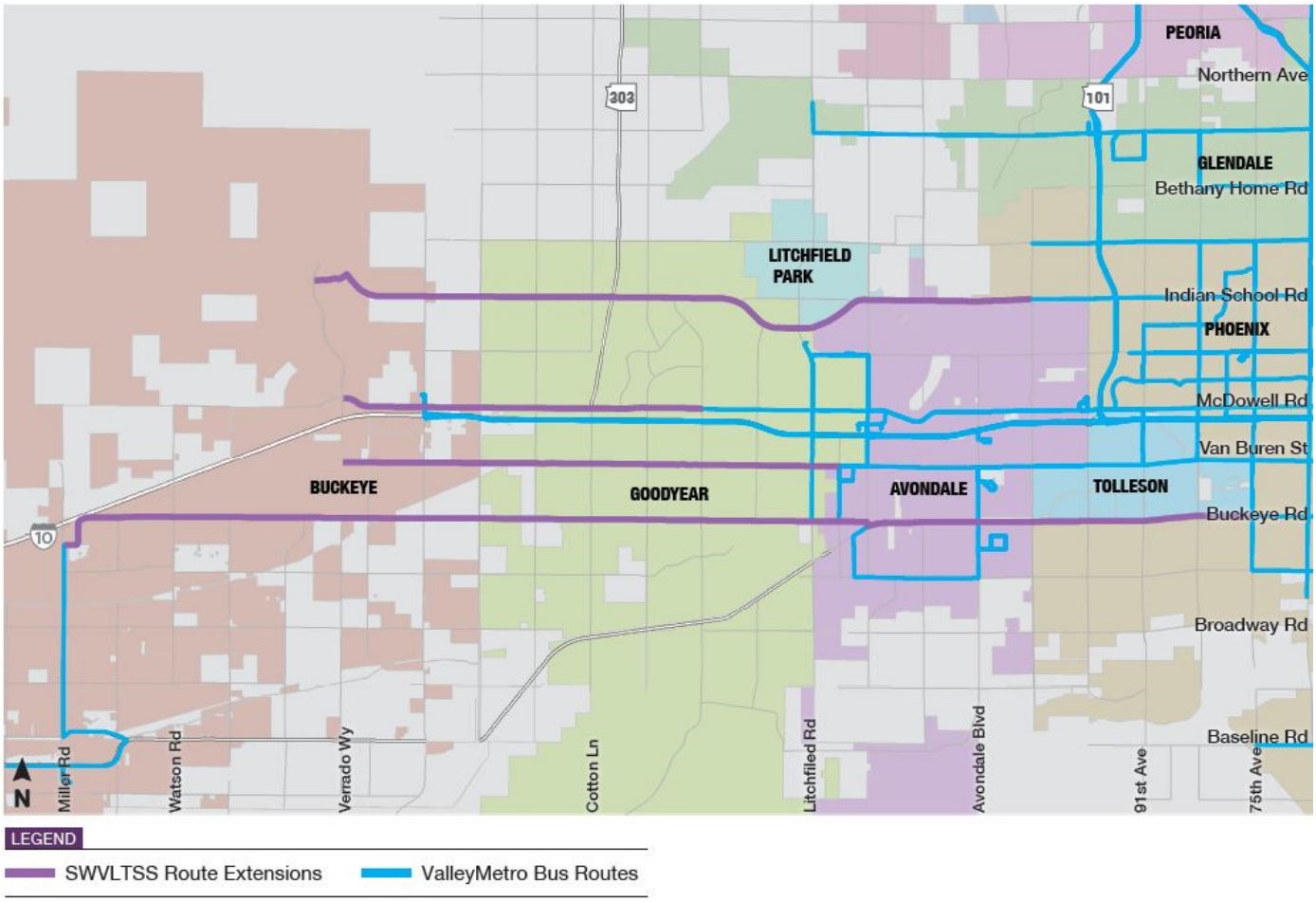


Source: Buckeye Transit Plan, Valley Metro, 2016.

Long-Term Service Recommendations

While the mid-term recommendation focused on circulation within Buckeye, the long-term service recommendation focuses on the extensions of local routes into Buckeye from neighboring jurisdictions. As illustrated in **Figure 3-3**, these routes operate on Buckeye Road (Yuma Road), Van Buren Street, McDowell Road, and Indian School Road, connecting across the Cities of Phoenix, Tolleson, Avondale, Goodyear, and Buckeye. Proposed routes along Van Buren Street, McDowell Road, and Indian School Road would all terminate at Verrado Way; whereas, the proposed route on Buckeye Road (Yuma Road) would connect to Route 685 at Miller Road. Technical analysis determined that the future conditions in Buckeye would not likely support the implementation of these route extensions by 2030; however, the 2016 Buckeye Transit Plan includes a recommendation for periodic reassessment of the timeline for implementation.

Figure 3-3: Local Route Extensions



Source: Buckeye Transit Plan, Valley Metro, 2016. SWVLTSS, MAG, 2013.

Designing Transit Accessible Communities Study

The MAG Designing Transit Accessible Communities Study (DTAC Study) was completed in 2013 and provides guidance for local jurisdictions when planning and designing transit stop locations. Although there are no specific recommendations for Buckeye, the DTAC Study provides a best practices approach for future transit stop planning. The transit stop access recommendations are included in Section 3.8 of this Transit Chapter.

Regional Transit Framework Study Update

The MAG Regional Transit Framework Study Update (Study Update) is an update from a previously completed 2010 Study. The Study Update identifies and prioritizes future high-capacity transit projects in Maricopa County. High-capacity transit is defined in the Study Update as consisting of Bus Rapid Transit (BRT), Streetcar, and Light Rail. The Study Update is currently underway and is anticipated to be completed in the summer of 2018 with a planning horizon of 2040. The latest interim Study reports do not indicate an anticipated demand for high-capacity transit service in Buckeye by year 2040; therefore, the Study Update does not currently identify investments of these types in Buckeye. However, the Study Update includes recommendations as to the factors influencing transit demand that have been considered in this Transit Chapter (see Section 3.7).

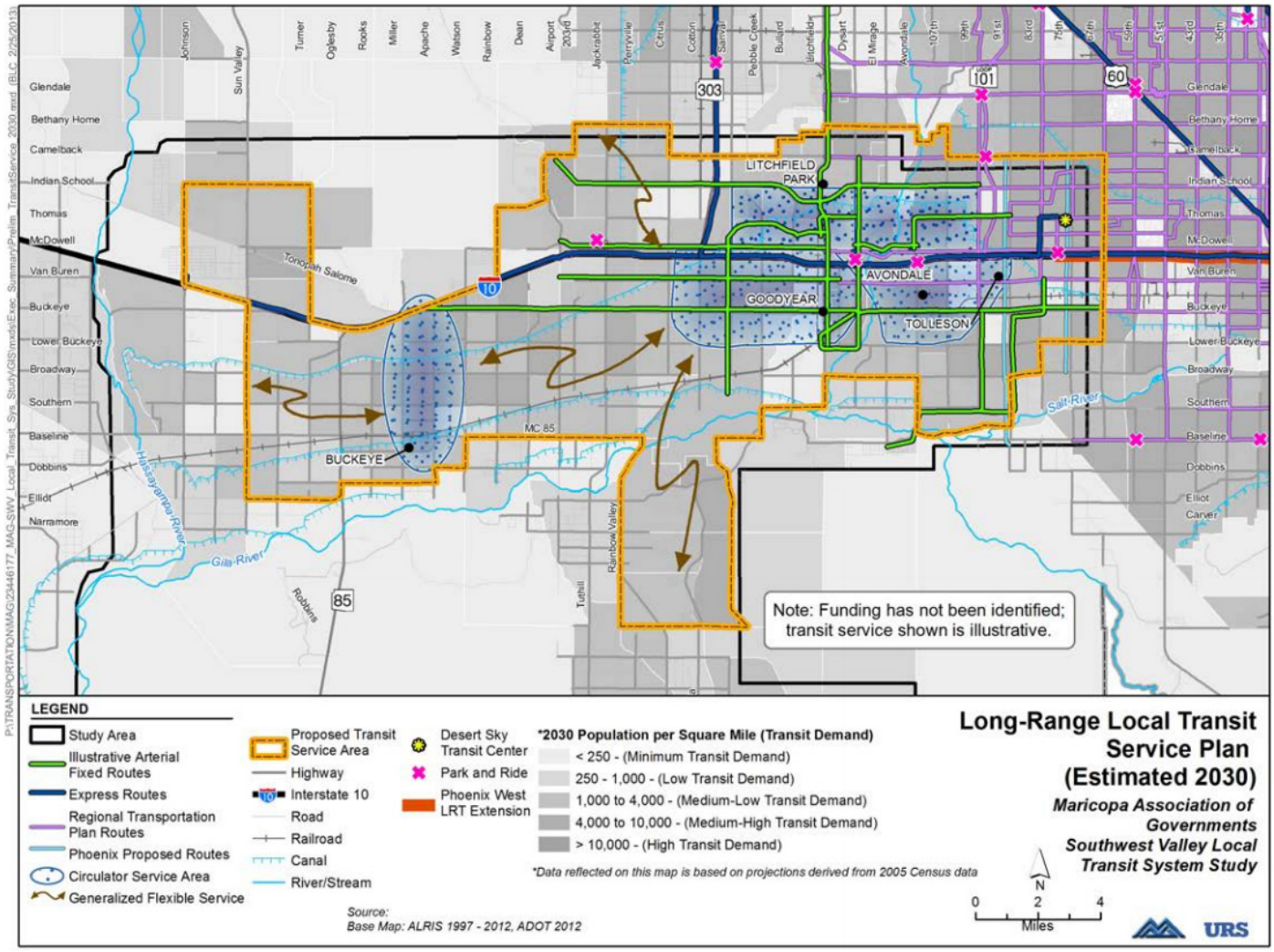
Southwest Valley Local Transit System Study

Completed in 2013, the Southwest Valley Transit System Study (SWVLTSS) assessed transit service needs in the Southwest Valley, including Buckeye, Avondale, Goodyear, Litchfield Park, Tolleson, West Phoenix and unincorporated Maricopa County. The study was conducted by MAG in cooperation with Valley Metro and the relevant member jurisdictions. The study provides short-, mid-, and long-range recommendations to enhance the overall transit system throughout the Southwest Valley upon implementation. Recommendations relevant to the City of Buckeye include three timeframes:

- Short-range: existing regional route (Route 685) that originates on MC 85 and traverses south through Buckeye, ending in Gila Bend.
- Mid-range: potential expansion of a local circulator transit service and extension of the I-10 commuter service to the western extents of the Buckeye city limits.
- Long-range: builds upon the mid-range recommendations and additionally includes an arterial fixed route service originating in Tolleson on the Yuma Road alignment and ending at Verrado Way in Buckeye. Long-range recommendations also propose Generalized Flexible Service within Buckeye, south of I-10.

The long-range recommendations, which are built off the short- and mid-range recommendations, of the SWVLTSS are illustrated on **Figure 3-4**. These recommendations were expanded upon in the 2016 Buckeye Transit Plan described previously.

Figure 3-4: SWVLTSS Long-Range Local Transit Service Plan



Source: MAG, Southwest Valley Local Transit System Study, 2013.

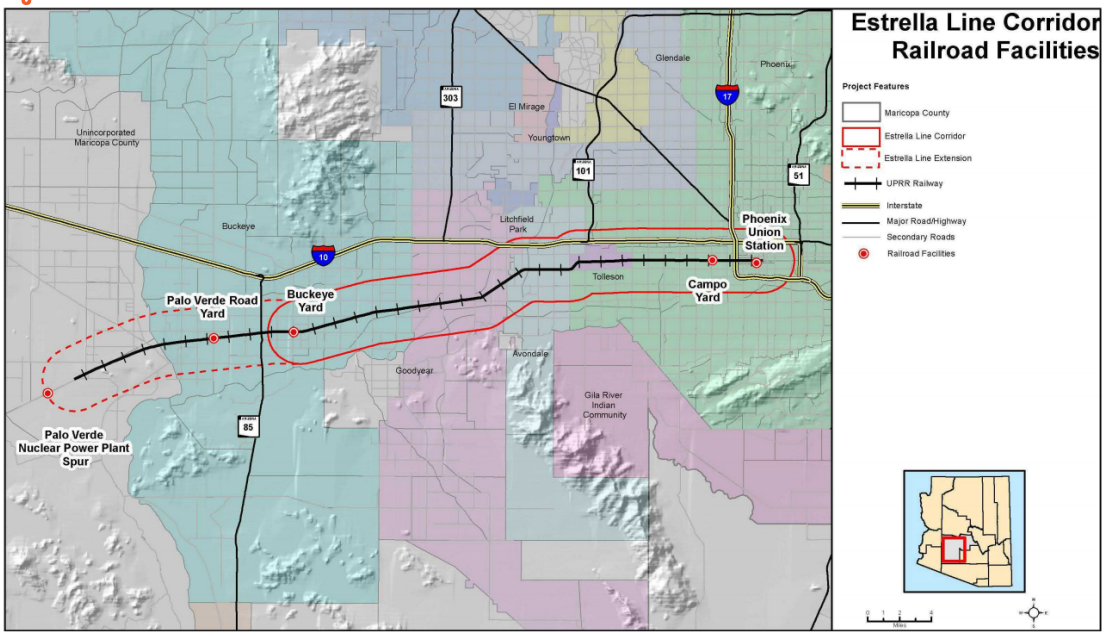
Commuter Rail System Study

MAG updated the 2010 MAG Commuter Rail System Study in the fall of 2018. The 2010 Study evaluated the need and feasibility of commuter rail including corridor alternatives in both the East and West Valley of the Phoenix metropolitan area. The update to this plan revises the results of the original study, further analyzing commuter rail corridors that were initially evaluate din 2010. One of the proposed corridors in the West Valley is the Estrella Line, previously the Yuma West in the 2010 plan, which extends west from Phoenix to Buckeye. This 45-mile corridor would be implemented on the existing UPRR line and would include a station/stop near Historic Downtown Buckeye. Other corridors recommended in the 2018 Study evaluated include: Grand Line (connecting downtown Phoenix to Surprise), the Kyrene Line (connecting downtown Phoenix, Tempe, and Chandler), the San Tan line (connecting downtown Phoenix, Tempe, Mesa, Gilbert, and Queen Creek), and the Chandler Corridor.

According to the plan, the Estrella Line is proposed to connect from Buckeye to Phoenix. The extension into Buckeye is proposed as a near-term corridor extension and is shown on Figure 3-5.

In 2010 MAG completed the Yuma West Commuter Rail Corridor Development Plan which included analysis of existing and future conditions, a conceptual corridor development plan, estimated costs, and implementation strategies. This study recommended implementation of the segment connecting to Buckeye between year 2030 and 2040 with 30-minute headways in the peak AM and PM hours and 60-minute headways in the off-peak hours.

Figure 3-5: Estrella Line Corridor Railroad Facilities



Source: MAG, Commuter Rail System Study, 2018.

Summary of Local and Regional Transit Plans

Of the five previous studies referenced, the Buckeye Transit Plan provides the most relevant recommendations for transit service in the City of Buckeye. The Buckeye Transit Plan included a 14-year planning horizon (Year 2030); therefore, the Buckeye Transit Plan concludes with two key findings, both of which should be consistently revisited and monitored:

- Existing development patterns, and the general undeveloped conditions of the community, do not create enough demand to operate a sustainable transit system for much of the Buckeye planning area.
- Once development occurs, demand for transit will require a financial commitment. Although some federal and regional funding sources exist, the City would need to provide a local financial match for capital improvement and operating costs.

Due to the timing of different route planning activities, the Buckeye Transit Plan does not include a recommendation to connect Route 563 with Route 685, resulting in a noticeable gap in the planned future transit network.

The Commuter Rail System Study highlights the potential for additional financial resources to be needed to support commuter rail service in Buckeye. While the financial requirement and governance structure have not been determined, the City understands the importance of commuter rail in providing commute solutions and enhancing the quality of life for existing and future residents.

Other MAG studies, including the Designing Transit Accessible Communities Study and the Regional Transit Framework Study, do not provide specific recommendations for Buckeye; however, these studies provide valuable best practice solutions that should be used to plan and design Buckeye as the city continues to grow and develop. These are:

- Population and Employment Density
- Socioeconomic Characteristics
- Travel Demand and Traffic
- Transit Service Frequency
- Transit Stop Accessibility

These best practices are summarized in Section 3.6 of this Transit Chapter.

3.6 Factors Influencing Transit Demand

As illustrated in Figure 3-6, demand for transit service is derived from consideration of several factors including population and employment density, socioeconomic characteristics, travel demand and traffic, land use activity, transit service frequency, and transit stop accessibility. Each of these factors described below is an important consideration in future transit route and stop planning as the City of Buckeye continues to develop.

Figure 3-6: Factors Influencing Transit Demand

Population and Employment Density

Historically, areas with a high concentration of jobs or residences tend to provide the ridership to support transit service. Based on the Future Land Use Plan from the Imagine Buckeye 2040 General Plan, population and employment projections were provided for the future buildout of the city. Buckeye's projected population and employment densities in year 2040 and at buildout are illustrated in Chapter 1, Introduction. The Local Bus Recommendations proposed in this chapter include routes that connect planned locations for medium- and high-density residential concentrations with medium- and high-density job concentrations.

Socioeconomic Characteristics

Among a community's population there are specific groups that are more likely to use transit, often referred to as transit-dependent or transit-advocates. These populations include, but are not limited to,

- zero- to one-vehicle households,
- people with disabilities,
- households with seniors over the age of 65,
- young professionals under the age of 30 (commonly referred to as Millennials), and
- low-income residents.

The 2016 recommendations from the Buckeye Transit Plan considered these socioeconomic characteristics. Since much of the Buckeye planning area includes undeveloped land, where future socioeconomic groups may live or work in the future cannot be projected; however, population and employment density have been projected as noted in Chapter 1. Future route feasibility planning must consider the location of these socioeconomic groups and how they increase the demand for transit use.

Travel Demand and Traffic

Roadways with high regional travel demands and high volumes of traffic, tend to provide the ridership to support regional transit service as individuals will seek alternative solutions to sitting in traffic. Locating transit service with dedicated lanes or traffic signal priority along these routes can provide an alternative means of transportation and encourage individuals to ride transit rather than drive a personal vehicle. These routes can help to reduce travel stress for individuals and provide relief to traffic congestion on roadways. The Local Bus Recommendations identified in this Transit Chapter are located along Arterial and Parkway corridors, which are anticipated to experience higher vehicular traffic volumes than the neighboring Collector or Local roadways.

Land Use Activity

In all communities, areas with denser, mixed use development patterns and pedestrian-friendly environments tend to provide the ridership to support transit service. The Imagine Buckeye 2040 General Plan identifies six activity centers:

- Buckeye Highlands
- White Tank Mountain Resort
- Buckeye Airport Employment
- Historic Downtown Buckeye
- Buckeye Gateway
- Buckeye Hills

These planned Activity Centers will be vibrant mixed-use areas providing destination locations. The Imagine Buckeye 2040 General Plan recommends creation of specific area plans for each Activity Center which would provide additional detail into the land uses, planning concepts, and local multimodal solutions for the Activity Center. These future Activity Centers should be supported by transit service and may be ideal locations for transfers between transit routes.

Transit Service Frequency

The size of the travel market for a transit stop is directly related to the density of development within a one-quarter to one-half mile travel envelope from the transit stop, unless otherwise specified by the City engineer. This is commonly considered the longest distance transit users will walk to access a stop location. Frequency of transit service is typically derived from the travel market for that stop location. To maintain good service for transit dependent riders and attract individuals who are not transit-dependent, transit service must be frequent, with buses arriving every 10- to 15-minutes; however, it is common to find transit stops with 30 minute or longer frequencies. The Buckeye Transit Plan includes recommendations for 30-minute service frequency (headways) for the local circulator service (Route 563). As the population and employment densities increase in Buckeye with additional anticipated development, service frequencies should be shortened to a 10- to 15-minute headway.

Transit Stop Accessibility

Transit Stop Accessibility has a socioeconomic focus on the needs of individuals identified in the Socioeconomic Characteristics section. Stop accessibility addresses the segment of an individual's trip between an origin or destination and the transit system or stop, specifically eliminating the barriers transit riders face when accessing transit stops. Valley Metro's *Bus Stop Inventory and Design Guidelines* provides guidance on the placement and design of bus stops throughout the metropolitan region. Additionally, in 2013 MAG published the *Designing Transit Accessible Communities Study* (DTAC Study) that provides guidance related to transit stop area amenities.

According to the DTAC Study, in the MAG region, approximately 90% of all transit users arrive at a transit stop by walking or biking to the stop location. The environment around transit stops is a significant factor influencing real or perceived issues of safety for transit riders. Key factors affecting transit accessibility include:

- lighting
- information signage
- wayfinding
- seating
- shelter
- shade
- adjacent land uses
- bicycle access
- bicycle parking
- pedestrian crossings
- sidewalk

The DTAC Study includes a Transit Accessibility Toolkit that identifies recommended improvements according to the development character of each stop area and should be considered in future transit stop planning.

Bus stops should be located at the far side of intersections so to not back up the right turn movement at intersections. Bus stop should be located within 600' of an intersection crosswalk to provide a safe crossing location across a street. Local serving transit stops should be spaced approximately every 1/4 mile to cover the market shed for transit service and should include a bus bay so buses do not cause intersection congestion. For high capacity transit routes (i.e. bus rapid transit or light rail) stop locations should be less frequent, approximately one to two miles. High capacity transit routes and stop typically do not require a bus bay as the bus rapid transit or light rail service should be provided with a dedicated lane. *It is the recommendation of this TMP that the City require developers to pay the cost of implementing the transit stop facilities including design and construction of the bus bay, shelter pad, sidewalk, and lighting adjacent to their property.*

3.7 Service and Route Recommendations

Expanded transit services will provide Buckeye residents with increased mobility options for commuting, whether for work, shopping, or leisure. The expansion of transit services will reduce the reliance of personal vehicles, thereby reducing the congestion and maintenance burden on the roadway network. The proposed service and route recommendations were developed by incorporating previous transit plan recommendations and through the identification of areas with projected medium- to high-density population and employment when Buckeye is at full buildout. These service and route recommendations guide future transit service enhancements including those for buses and commuter rail networks.

The Transit network component was created by determining the locations of trip generators and higher density land uses identified in the planned future build out in the City's General Plan. Although targeted service areas and regional stop locations are identified, the Transit network does not identify local bus stop locations, which are typically determined once a build out development pattern is established. Actual demand for transit service is a function of population density, employment density, and specific socioeconomic groups that are likely to utilize transit service. Given much of Buckeye is not yet developed, the following transit planning for route operations could not be conducted as part of this Transit Plan:

- service frequency
- hours of operations
- specific local bus stop locations
- fleet requirements

The Transit Plan includes four types of expanded transit services: a commuter rail route, rapid transit routes, fixed route bus services, and carpool and vanpool programs. The proposed routes are described in the following sections and shown on Figure 3-7.

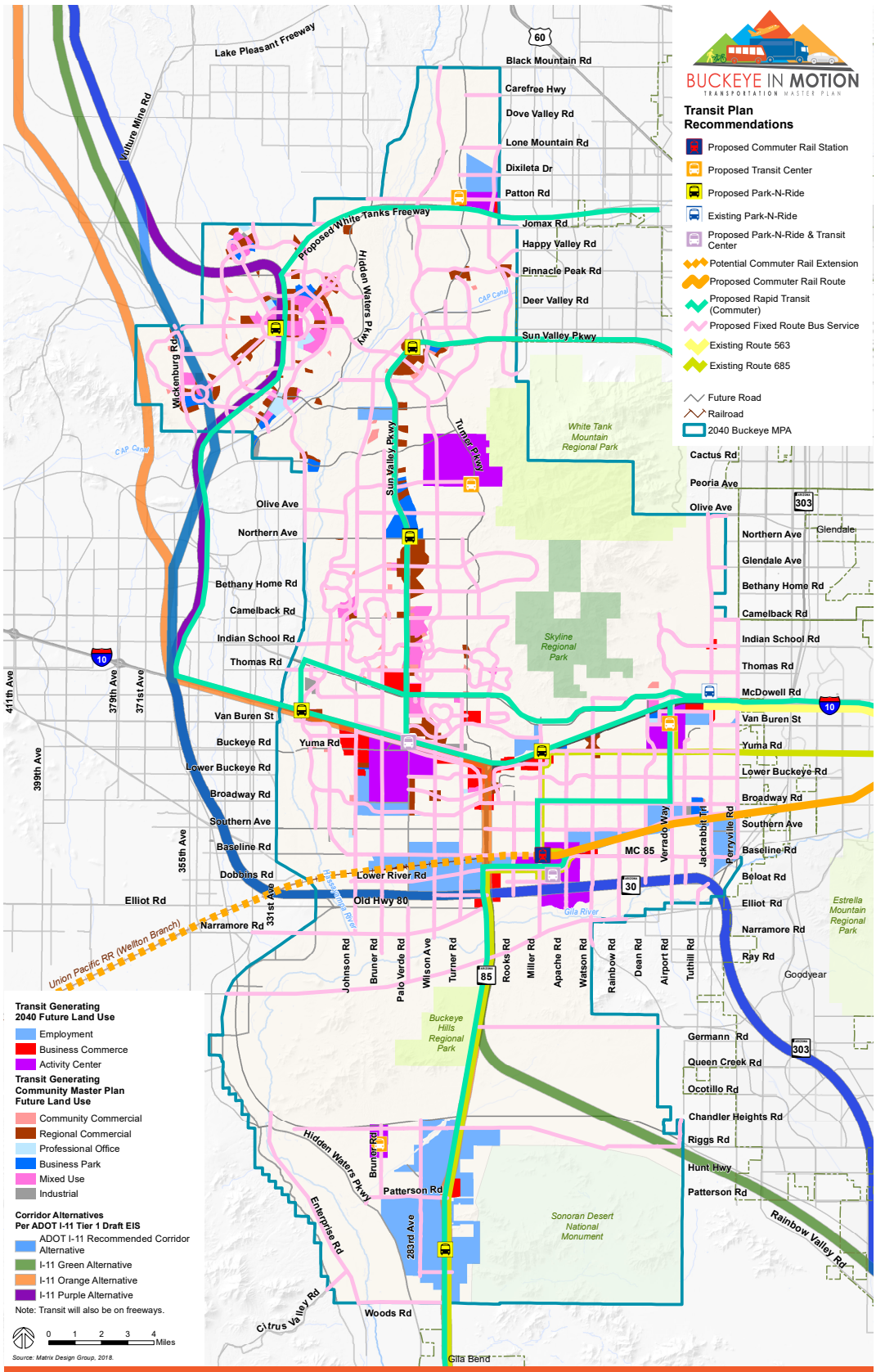


Figure 3-7
Transit Plan Recommendations

Rapid Bus Recommendations

Not to be confused with Bus Rapid Transit, Rapid bus transit is a Valley Metro brand name describing commuter express transit service. Rapid bus transit is transit service that is generally located on highways and operates during high-traffic commuting hours in a municipality. Rapid bus transit has the following characteristics:

- Riders of rapid bus transit board and await buses at park-n-ride facilities throughout the region.
- Typically, rapid bus transit does not include local bus stops along their service routes.
- Due to higher travel speeds and fewer stops, rapid bus transit has less travel time than local buses, yet can travel long distances.
- Rapid bus transit may be developed on existing rights-of-way of transportation corridors or may be developed on exclusive rights-of-way.

A recommendation is to implement rapid transit routes and services to meet commuter growth throughout the city. As illustrated in **Figure 3-7**, the proposed routes for rapid transit connects Buckeye from north to south and east to west and extends outside the city to provide regional connectivity with other cities in the Phoenix metropolitan area. Within Buckeye, rapid bus transit routes are recommended along the following routes:

- Future White Tanks Freeway
- Future I-11 Freeway
- I-10 Freeway
- McDowell Parkway (with 1.5-mile connection on 319th Avenue)
- SR 85 (connecting through Downtown Buckeye, terminating at Jackrabbit Trail park-n-ride)
- Sun Valley Parkway

Ultimately, the combination of these six routes will accommodate commuters accessing jobs outside of Buckeye in Gila Bend, Ajo, and the greater Phoenix region.

Local Bus and High Capacity Transit Recommendations

Local bus service provides scheduled, fixed-route passenger transportation service. These services include frequent stops throughout the community and on roadways classified as arterials or parkways, providing connectivity between neighborhoods and destinations within the city as well as to other neighboring cities. The recommended local bus routes are intended to supplement existing bus routes in Buckeye and connect destinations across the Buckeye planning area including important connections to rapid transit bus stops. **Figure 3-7** depicts the recommended local bus routes in the Buckeye transit network. As Buckeye continues to develop, additional transit feasibility studies will need to be conducted to determine the implementation phasing and operation of transit routes, specific stop locations, service frequencies, and hours of operation.

Additionally, the City should study if high capacity transit, such as bus rapid transit or light rail transit could be supported in the future. Along the streets identified as local bus routes, additional right-of-way should be reserved for dedicated lane service via a Bus Rapid Transit system or fixed rail transit system (i.e. light rail or streetcar). The additional right-of-way necessary should be one lane of travel in each travel direction (approximately 24' total). Given the ability to dedicate a full lane to transit service, no additional right-of-way would be needed for bus bays along the corridor.

Carpool and Vanpool Program Recommendations

The City of Buckeye is anticipated to continue participating in Valley Metro's two Commute Solution Services: Carpool Program and Vanpool Program. The Carpool Program assists commuters with matching riders with similar commutes to carpool. Participants in the Carpool Program agree upon the time and location to meet, vehicle to use, and any compensation for the driver of the vehicle. The Vanpool Program provides groups of six to 15 people with a passenger van. In the Vanpool Program, one of the qualified participants volunteers to be the driver and each rider pays a monthly fee to cover vehicle maintenance and fuel. As the city limits of Buckeye continue to expand, so too will the service areas for the City's Carpool and Vanpool Programs.

3.8 Transit Stop Recommendations

Future transit stop facilities will consist of park-n-ride facilities, bus stops, and a commuter rail station, each of which provide a different type of transit service. Each type of transit stop is discussed in the following sections.

Local Bus Stop Recommendations

Local bus stops provide a pick up and drop off location for passengers on local bus routes. Stop amenities vary and may include a transit shelter, signage, seating, and lighting. Although not identified in this Transit Chapter, future local serving bus stops would occur more frequently than park-n-ride facilities. Only existing bus stops are identified on Figure 3-7 and listed in Table 3-1. Future bus stop locations will be determined as the city develops and only after a further study of route feasibility and operations is conducted, including determining stop locations, service frequency, hours of operation, and fleet requirements. In general, developers should assume a bus stop at every mile along arterials and more frequently where determined by the City Engineer. Provided in Section 3.6 of this Transit Chapter are factors to be considered in future transit stop and route planning.

Park-n-Ride Recommendations

Park-n-ride facilities are dedicated lots with parking for commuters to park their personal vehicles or bicycles while using transit. Multiple local and rapid bus transit routes would converge at these stops. There are multiple park-n-ride stop recommendations for the Buckeye transit network. An existing park-n-ride is located at Jackrabbit Trail and McDowell Road. Additional park-n-ride facilities should be developed as rapid bus transit routes are established. The Transit Service Recommendations includes seven park-n-ride facilities, which are listed in Table 3-2.

Table 3-2: Proposed Transit Hubs

Stop Type	Location
Park-N-Ride and Transit Center	I-10 and Palo Verde Road
Park-N-Ride and Transit Center	Miller Road and MC 85
Transit Center	Turner Parkway and Patton Road
Transit Center	Turner Parkway and Peoria Avenue
Transit Center	Van Buren Street and Verrado Way
Transit Center	Bruner Road and Riggs Road
Park-n-Ride	Future I-11 at Douglas Ranch
Park-n-Ride	Sun Valley Parkway and Turner Parkway
Park-n-Ride	Sun Valley Parkway and Northern Avenue
Park-n-Ride	I-10 and 319th Avenue
Park-n-Ride	I-10 and Miller Road
Park-n-Ride	SR 85 and Patterson Road

Source: City of Buckeye, Matrix Design Group, 2018.

Transit Center Recommendations

Transit Centers are locations where multiple transit routes converge and allow the rider to easily transfer between routes. Transit Centers may be located on public property or private property. Transit Centers located on private property require a shared use agreement with the property owner. Ideally future transit centers would be located on private property so to reduce the City's maintenance costs. Recommended transit center locations are listed in Table 3-2.

3.9 Transit Implementation and Funding

The process for implementing an expanded transit system in the form of commuter rail, rapid bus transit, and local bus transit requires the coordination and support of local, regional, and federal agencies.

Funding

There are several federal formula funds that can be used to partially fund transit costs through the Federal Transit Administration, such as:

- Section 5311 – Rural Areas: This program provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000.
- Section 5310 – Enhanced Mobility of Seniors and Individuals with Disabilities: This program is intended to enhance mobility for seniors and persons with disabilities by providing funds for programs to serve the special needs of transit-dependent populations.
- Section 5307 – Urbanized Areas: This program provides grants to urbanized areas (over 50,000 population) for public transportation, capital, planning, job access, and reverse commute projects as well as operating expenses in certain circumstances.

Portions of Buckeye's eastern area is within the Avondale-Goodyear Small Urbanized Area (UZA) and it is anticipated that this area will be merged with the Phoenix-Mesa UZA or reclassified as a large UZA after the next decennial census in 2020. After 2020, many of the remaining portions of Buckeye are anticipated to be classified as a small UZA. Depending on how Buckeye is classified following the 2020 U.S. Census will determine the eligibility for transit services in Buckeye under each of the federal formula funds. Whether if Buckeye becomes a small UZA, becomes a large UZA with Avondale-Goodyear, or is merged with Phoenix-Mesa UZA, all funding eligibility will be determined by processes established by MAG. MAG's *Regional Programming Guidelines for Federal Transit Formula Funds* provides additional information related to programming decisions for each of the UZAs.

The potential extension of Maricopa County's Proposition 400, the Transportation Excise Tax (TET) set to expire in 2025, is a potential source of funding for transit services at the local level. Revenue from the TET is distributed to the Freeway, Arterial and Transit Life Cycle Programs in percentage of 56.2, 10.5, and 33.3 respectively. The Transit Life Cycle Program (TLCP), maintained by the Regional Public Transportation Authority (RPTA) to implement transit projects in the MAG Regional Transportation Plan (RTP), receives a third of the monthly revenues, which are deposited into the RPTA Public Transportation Fund, and allocated accordingly to the following split: 56.76% to bus programs and 43.24% to light rail / high-capacity programs. Importantly, there is currently not a dedicated funding source for operations and maintenance.

As Buckeye continues to develop and grow, the City's transportation system, including public transit and the operations and maintenance of that system will grow as well and demand more City funding and staff resources. Creation of a transit or transportation tax in Buckeye could provide a sustainable fund for transportation infrastructure maintenance, transit operations, and the required local match for regional, state and federal funding sources. Other potential funding includes Arizona Lottery Funds, Buckeye General Fund, passenger fares, and advertising revenue.

Funding commuter rail operations and maintenance requires a combination of local, state, federal and sometimes private funding sources. Although outside sources of funds can be used to initiate and support commuter rail, implementation of commuter rail will require local governments to annually provide funds to meet the ongoing capital, operating, and maintenance costs.

Commuter rail is just one form of public transit that could be funded through a public-private partnership (P3) agreement. Additionally, some cities have chosen to operate transit service through a P3 agreement.

Implementation

This TMP Transit Chapter provides long-range recommendations to determine the potential provision of transit service at full buildout of the Buckeye planning area. Many of these recommendations require additional study once development has occurred. Implementation of these recommendations requires collaboration with regional transportation planning entities, Valley Metro and MAG. Local Bus and High Capacity Transit Recommendations will require future system and route feasibility studies to determine the operations requirements for transit service expansion including bus stop locations, service frequencies, hours of operations, and fleet requirements. Rapid Bus Recommendations require an expanded service agreement between the City and Valley Metro, which should only be undertaken once the density of development would trigger demand for commuter transit.

Table 3-3 provides a listing of the Short-term Transit System Recommendations. Table 3-4 provides a listing of the Mid-term Transit System Recommendations. Table 3-5 provides a listing of the Long-term Transit System Recommendations. The planning-level costs and other implementation actions associated with these improvements are included in Chapter 9 Implementation.

Table 3-3: Short-term Transit System Recommendations

Project Name	Description	Sources
Continued Transit Service	Continue to operate Routes 563 and 685 as well as the Vanpool and Carpool Programs.	TMP
Identify Transit Funding Sources	Assess available funding sources for transit and determine if a local transit tax is needed now or in the future to make sustainable transit investments.	TMP

Source: City of Buckeye, Matrix Design Group, 2018.

Table 3-4: Mid-term Transit System Recommendations

Project Name	Description	Sources
Transit Feasibility Study	Conduct city-wide study to determine priorities for service expansion and recommendations for operations of transit service, including expansion of local routes, rapid routes, and the carpool and vanpool programs.	TMP

Source: City of Buckeye, Matrix Design Group, 2018.

Table 3-5: Long-term Transit System Recommendations

Project Name	Description	Sources
High Capacity Transit Studies	Conduct corridor studies to determine implementation of high capacity transit service along high demand transit routes.	TMP

Source: City of Buckeye, Matrix Design Group, 2018.

3.10 Summary

Transit service is important for a growing and diverse community. The Imagine Buckeye 2040 General Plan includes policies for expanding transit service to the six future Activity Centers and the broader community. This Transit Chapter provides recommendations on several transit service types including Commuter Rail, Rapid Bus Transit, Local Bus and High Capacity Transit, Carpool, and Vanpool. Furthermore, this Transit Chapter provides guidance for future transit stop locations and how to plan for future transit demand. The transit service expansion recommended in this Transit Chapter provides robust service to connect future medium- and high-density residential and employment concentrations across the Buckeye planning area.

This Transit Chapter provides long-range recommendations to determine the potential provision of transit service at full buildout of the Buckeye planning area. Many of these recommendations require additional study once development has occurred. Implementation of these recommendations requires collaboration with regional transportation planning entities, Valley Metro and MAG. While regional funding is available through the TLCP, the City must plan to fund the local match required in both the initiation of transit service and for the ongoing maintenance and operation of transit service.

Recommendations of this Transit Chapter are incorporated in Chapter 9 (Recommendations and Implementation) of this Transportation Master Plan along with the recommendations of other Transportation Master Plan Elements (Streets, Active Transportation, Aviation, Rail, Freight, and ITS).

ACTIVE TRANSPORTATION CHAPTER 4

4.1 Introduction

Biking, walking, running, hiking, and equestrian are important to Buckeye's future as they are a means to address several interrelated challenges, including traffic, air quality, public health, and safety issues, all while creating community gathering space. By planning a city that is safe for pedestrians and bicyclists, the City can positively affect all of these areas, which collectively can have a profound influence on the quality of life in Buckeye. Quality of life in Buckeye can be influenced by providing opportunities to have an active lifestyle and by providing spaces for community interaction.

The active transportation component in Buckeye's transportation network includes facilities for bicyclists, pedestrians, and other activities, such as equestrian activity. Providing for bicyclist and pedestrian use presents an alternative and active form of transportation for commuting and for recreational activities both of which support healthy communities. Additional detailed recommendations for bicycle and pedestrian networks will be further described in the City of Buckeye Bicycle and Pedestrian Master Plan, which is closely coordinated with the Parks and Recreation Master Plan and this Transportation Master Plan. This Active Transportation Chapter includes the following sections:

- Section 4.1 **Introduction.** Active Transportation Chapter purpose and contents.
- Section 4.2 **Existing Active Transportation Facilities.** Active transportation infrastructure that exists in Buckeye.
- Section 4.3 **Imagine Buckeye 2040 General Plan.** Active Transportation and related Land Use Goals and Policies from the Imagine Buckeye 2040 General Plan.
- Section 4.4 **Multimodal Integration.** Strategies for integration of active transportation facilities within Buckeye.
- Section 4.5 **Relevant Active Transportation Plans.** Relevant previous plans and studies that support the recommendations of the Active Transportation Chapter.
- Section 4.6 **Factors Influencing Active Transportation.** Factors that create demand for active transportation facilities, healthy community indicators, understanding latent demand, understanding trip types, and pedestrian / bicycle friendly streets and communities.
- Section 4.7 **Active Transportation Recommendations.** The foundation for determining future active transportation facilities to be further examined in the Bicycle and Pedestrian Master Plan process.
- Section 4.8 **Implementation and Funding.** Implementation and the potential funding sources for the Active Transportation Chapter.
- Section 4.9 **Chapter Summary.** Summary of the Active Transportation Chapter.

4.2 Existing Active Transportation Facilities

Buckeye's current active transportation network consists of a combination of on-street bicycle facilities, sidewalks, paths and trails that are owned and maintained by various entities including the City of Buckeye, Maricopa County, and local homeowner's associations (HOAs). Existing active transportation facility types in Buckeye include on-street facilities, off-street facilities, and sidewalks. **Figure 4-1** illustrates and **Table 4-1** lists the total miles of each facility type present in Buckeye. Each of these facility types are described below.

Table 4-1: Existing Active Transportation Facilities*

Facility Type	Miles
Bike Lane	21
Bike Route	40
Paved Shoulder	50
Multi-Use Path - Unpaved	27
Multi-Use Path - Paved	24
Recreational Trail	28

** Sidewalks not included in table*
Source: City of Buckeye, 2017

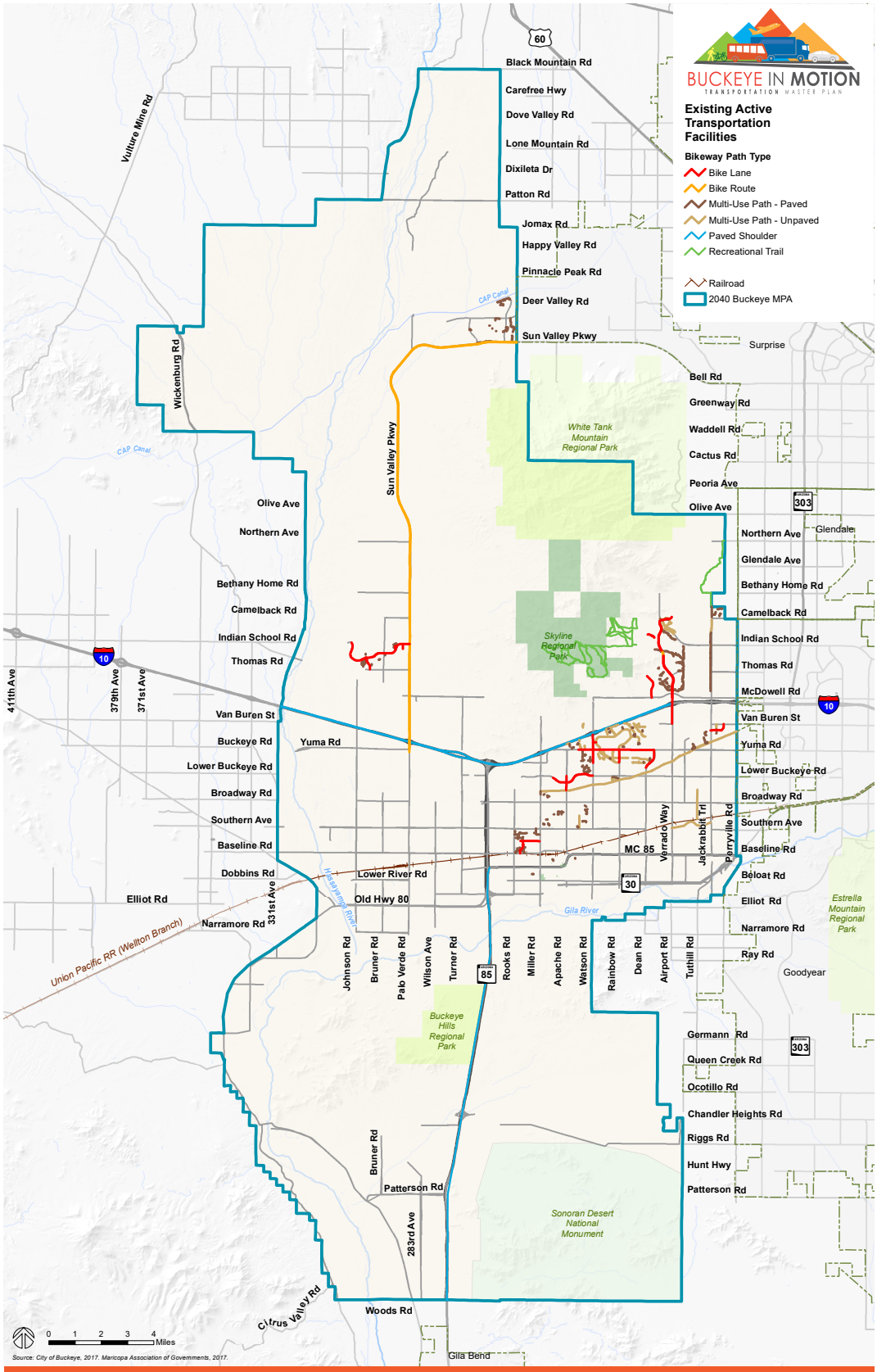


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Figure 4-1

Existing Active Transportation Facilities

On-street Bicycle Facilities

On-street bicycle facilities in Buckeye consist of bike lanes, bike routes, and paved shoulders. Although there are various bicycle facility types within Buckeye, there is not a complete network for this mode of active transportation. The longest routes available for bicycling are facilities that are unprotected from vehicles, such as bike routes and paved shoulders along Parkways where traffic speeds may create real or perceived safety concerns for cyclists. According to the National Association of City Transportation Officials (NATCO), speeds play a role in the cause and severity of crashes – there is a direct correlation between higher speeds, the risk of crashing, and the severity of injuries from crashes. While the design of the roadways should consider the speeds that are associated with the types of street classification, the use of roadways for bicycle use shall also be done in accordance with ARS 28-815 which sets regulations for bicycling on roadways.

Each of the on-street bicycle facility types are described below.

Bike Routes

Bike Routes, also referred to as share the road or “sharrow” facilities, are the most widely implemented facility types in the United States. The appeal to municipalities is that they are very inexpensive and generally require no capital improvements to the road width. Bike routes require careful considerations in terms of streets in which they are incorporated. This treatment is typically reserved for streets with low traffic volumes and slower speeds as the travel lanes are shared by both vehicles and bicycles. Motorists and cyclists can become confused as to who has right-of-way within the travel lane. Often these facilities will be accompanied by share the road signage (which should consider the Manual on Uniform Traffic Control Devices by the U.S. Department of Transportation Federal Highway Administration guidance or as otherwise guided by the City) bike route signage, pavement markings, and/or ordinance signage. A designated bike route exists only on Sun Valley Parkway.

Bike Lanes

Bike lanes can be relatively inexpensive bicycle treatments that can go a long way in helping to increase Level of Service (LOS) for bicyclists. Given roadway conditions, particularly geometry, roadway width, traffic volume, and number of travel lanes, bike lanes can be installed economically. One of the largest advantages of implementing bike lanes is that they delineate separate travel lanes for cyclists and drivers. Additionally, bike lanes are easily recognizable to drivers and help to visually communicate city ordinances in relation to shared right-of-way use. Bike lanes are found throughout 15 different roadways in Buckeye. The longest bike lane segments can be found on portions of Verrado Way, Yuma Road, Lower Buckeye Road, and Tartesso Parkway.

Paved Shoulders

Paved shoulders are often used to accommodate bicyclists and pedestrians on rural roads where volumes of traffic are relatively low. If a roadway shoulder is frequently used by cyclists, it is recommended that supplemental bicycle signage be added and regular street sweeping be conducted to clear debris from the road shoulders. A paved shoulder bicycle route exists on I-10 west of Verrado Way.

Off-street Facilities

Off-street active transportation facilities in Buckeye consist of multi-use paths and recreational trails. Multi-use paths and trails provide low-stress and recreational routes for a bicycle and pedestrian network. Paths and trails in Buckeye have multiple uses, such as hiking, walking, mountain biking, and equestrian use.

Multi-use Paths

Multi-use paths are off-street facilities reserved for the use of pedestrians and bicyclists exclusively and typically consist of a paved surface treatment. Multi-use paths can serve local trips and are often preferred by non-experienced bicycle riders and families riding together.

Trails

Trails are a recreational facility that have an unpaved surface treatment (i.e. crushed gravel or dirt). Trails are typically designed for recreational riders and do not serve local trip options. Trail users can include non-experienced riders as well as experienced riders (i.e. mountain bike riders and equestrians). City owned trail facilities are limited to those in Skyline Regional Park, Sundance Park, and Earl Edgar Recreational Facility. While City owned paths and trails are somewhat limited, several of the community master plans in Buckeye have paths or trails that connect parks and greenbelts. Additionally, Maricopa County and other regional and state entities own and maintain trails within Buckeye. In summary, trails in Buckeye can be found at:

- Skyline Regional Park
- Buckeye Hills Regional Park
- White Tank Mountain Regional Park
- Sonoran Desert National Monument
- Hassayampa River
- Gila River
- Maricopa Trail
- Wildlife corridors

Sidewalks

Although not illustrated in Figure 4-1 or listed in Table 4-1, many roadways within Buckeye include sidewalks. Unlike bicycle facilities, pedestrian facility design does not have a great variation. Typically, pedestrians travel along four different route types: detached sidewalks, attached sidewalks, multi-use paths and trails, and footpaths. Footpaths are locations where pedestrians

may travel that are unconstructed or not engineered, and typically indicate a need for a formalized walking environment to be constructed (e.g. sidewalk or multi-use path/trail). Existing sidewalks in Buckeye are typically a hard surface available for pedestrian use. Although the City's street design standards recommend sidewalks or paths along all roadways, some existing roadways are not built to the City's street design standards and do not include a dedicated pedestrian environment provided by a sidewalk or path. Both detached sidewalks and attached sidewalks are present in Buckeye. Each of these facility types are described as follows.

Detached Sidewalks

Detached sidewalks are sidewalks that incorporate a buffer between the traffic lane and the pedestrian zone. These buffers can be merely concrete extensions of the sidewalk or they can be landscaped with textured surfaces or trees. The main idea is to provide a buffer between the vehicle and pedestrian zones.

Attached Sidewalks

Attached sidewalks are sidewalks that are not separated from the curb. This facility type is more common in older or historic areas as well as commercial corridors where there are large concentrations of commercial and public or institutional uses. Attached sidewalks typically do not accommodate as many pedestrians as detached sidewalks; this is because pedestrians tend to shy away from vehicular traffic near the curb. For this reason, attached sidewalks are not recommended unless widths are significantly increased.

4.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan identified Goals and Policies relevant to active transportation. Of all the Transportation Master Plan elements, active transportation has the most policy guidance. This policy guidance will be valuable in identifying active transportation routes and facilities in the future Bicycle and Pedestrian Master Plan.

Additionally, the policies make it clear that active transportation is compatible with various land uses in Buckeye. One of the land uses most compatible is Open Space. Many of the policies in the Imagine Buckeye 2040 General are related to provided links to different open spaces in the form of paths and trails. There is also a need expressed in the General Plan to provide connectivity between neighborhoods and neighborhood destinations, such as commercial areas. This makes both Residential and Business Commerce land uses compatible with active transportation as well.

These active transportation-related Goals and Policies provide a foundation for future active transportation network planning. The policies state the importance of active transportation infrastructure as well as the role development plays in building it.

Relevant Goals and Policies from the Imagine Buckeye 2040 General Plan are as follows:

- **Goal G-1** To guide a pattern of land uses that provides opportunities for diverse, active lifestyles, and excellent quality of life.
  - **Policy G-1.6** The City of Buckeye will work with Maricopa County and adjacent cities to encourage land uses that are compatible with Buckeye's Future Open Space and Trail (Figure 4-1) and Parks and Recreation Master Plan (2016).
- **Goal G-4** Mixed-use land patterns are developed in appropriate areas throughout the community.
  - **Policy G-4.2** Mixed-use projects should only be designed to support walkability and liability through complete streets concepts, amenities, and services.
- **Goal G-9** Buckeye has an expansive and diverse economy.
  - **Policy G-9.8** The City of Buckeye should take advantage of natural resource and outdoor recreation assets adjacent and within the future City for ecotourism and outdoor recreation uses.
- **Goal G-19** Buckeye has attractive, high quality, and healthy neighborhoods.
  - **Policy G-19.2** The City of Buckeye should promote the development of active communities that are designed to promote pedestrian and bike usage and provide equitable and convenient access to parks, schools, recreation facilities, other public facilities, and shopping areas that are interconnected by trails.
- **Goal S-9** Buckeye is a connected community with an efficient multimodal transportation network.
  - **Policy S-9.2** New development should provide active transportation facilities, such as pedestrian paths, bike paths, and trails that enhance connectivity between community green spaces and to regional parks and the Maricopa County trail system.

- **Policy S-9.4** The City of Buckeye should design roads for multimodal accessibility, including transit, bicycles, and pedestrians.
- **Policy S-9.5** Collector streets should continue and connect community master plans to provide alternative pedestrian, bike, and transportation routes without dependency on the arterial network.

- **Goal S-10** Buckeye has a regional approach to transportation planning.
  - **Policy S-10.4** The City of Buckeye should work with MCDOT to assess the future viability of attached or detached bicycle and pedestrian paths on Sun Valley Parkway.
  - **Policy S-10.5** The City of Buckeye should seek intergovernmental agreements with canal districts, utility providers, and the flood control district for shared use of maintenance roads for pedestrians and bicyclists.

- **Goal S-14** The bicycling and pedestrian circulation system is a well-connected and maintained network, enabling access to all parts of the City.
  - **Policy S-14.1** The City of Buckeye should utilize MAG's Bicycle and Pedestrian Master Plan and the City's Parks and Recreation Master Plan for guidance until the City of Buckeye adopts its own Bicycle and Pedestrian Master Plan through the pending Buckeye Transportation Master Plan.
  - **Policy S-14.2** The City of Buckeye will promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provide access to key destinations, including community facilities (such as schools, libraries, and parks), shopping areas, jobs, and activity centers, with appropriate linkages to neighborhoods.
  - **Policy S-14.3** The City of Buckeye should connect parks to planned bicycle routes and recreation corridors, including trails, such as along the Hassayampa River, Gila River, and to Skyline Park and White Tank Mountains Regional Park.

- **Policy S-14.4** The City of Buckeye will develop a multimodal policy that supports all modes of transportation and addresses the inclusion of pedestrian and bicycling facilities in new and existing road corridors, where appropriate.

- **Policy S-14.5** The City of Buckeye should provide bicycle access in and near Activity Centers, neighborhoods, community centers, parks, and other appropriate destinations.

- **Policy S-14.6** The City of Buckeye will require new development to provide and maintain appropriate bicycle infrastructure such as bicycle racks, lockers, lanes, and paths.

- **Policy S-14.7** The City of Buckeye should ensure that streets in Activity Centers support high levels of pedestrian activity.

- **Goal ST-1** Buckeye is dedicated to preserving the aesthetic and environmental qualities of the desert.

  - **Policy ST-1.7** In order to actively seek to reduce, avoid, or minimize impacts, the City of Buckeye should work to include a requirement during the initial phases of planning by the developer to consult the Open Space and Trail plan, wildlife linkages, and drainage ordinances to identify where impacts may be potential.

- **Goal ST-4** Buckeye upholds a standard of high-quality design in the built-environment.

  - **Policy ST-4.1** Activity Centers should be developed with a focus on walkability, bikeability, and overall pedestrian connectivity.

  - **Policy ST-4.3** Where possible, new development should minimize surface parking and design projects to encourage use of alternate modes of transportation.

- **Goal ST-5** Buckeye has a network of paths and trails that provide local and regional links.
  - **Policy ST-5.1** The City of Buckeye should develop a comprehensive network of paths and trails between natural and man-made linear features, such as canals and powerline corridors, to provide connectivity between open spaces.
  - **Policy ST-5.2** The City of Buckeye should provide multi-use paths and trails between parks and other passive and active recreational facilities.
  - **Policy ST-5.3** The City of Buckeye should encourage paths between planned communities and trail networks.
  - **Policy ST-5.4** The City of Buckeye will coordinate with adjacent cities and Maricopa County to establish connections with trails identified in their parks or trails Master Plans.
  - **Policy ST-5.5** The City of Buckeye will partner with Maricopa County to develop the Maricopa Trail through Buckeye's MPA and ensure linkages to the trail as well as regional parks in coordination with the TMP.
  - **Policy ST-5.6** The City of Buckeye should prioritize open space connectivity between natural resources, such as Rivers to Ridges, by connecting the White Tank Mountains south to the Gila River and west to the Hassayampa River.
- **Goal ST-11** Neighborhoods in Buckeye are unified while maintain their own unique character.
  - **Policy ST-11.3** The City of Buckeye should utilize paths, trails, open space, and community facilities to link neighborhoods.

- **Goal ST-8** Energy in Buckeye is used responsibly and efficiently.
  - **Policy ST-8.3** The City of Buckeye should encourage developers to maximize the use of native vegetation for shade around buildings, parking surfaces, and sidewalks to reduce heat absorption and energy used for cooling. The City should also encourage the retention of natural wash corridors and open spaces to reduce heat absorption and energy used for cooling.
- **Goal ST-14** Buckeye is an active city with programs and facilities that enable healthy lifestyles.
  - **Policy ST-14.2** The City of Buckeye should plan neighborhoods to be within ¼ mile to ½ mile of a pocket or neighborhood parks and paths and trails that connect them into a system.
  - **Policy ST-14.5** The City of Buckeye should provide a system of off-street paths and trails that connect parks and open spaces with residential and commercial areas.

The policies state available community assets including general destinations to connect, specific destinations to connect, possible infrastructure to be utilized to make these connections, and supporting infrastructure to be provided. Each of these asset types are summarized in Table 4-2.

Table 4-2: Imagine Buckeye 2040 General Plan Policy Guidance

General Destinations	Specific Destinations	Infrastructure to Utilize	Supporting Infrastructure
Community parks / green spaces Regional parks Public facilities Recreational facilities Community centers Libraries Schools Activity centers Shopping areas Jobs centers Neighborhoods	Maricopa County trail system Sun Valley Parkway Hassayampa River Gila River Skyline Park White Tank Mountains Regional Park	Roadways Canals Powerline corridors Flood control district properties Washes Wildlife corridors	Bicycle racks Bicycle lockers Bicycle lanes Paths Shade

4.4 Multimodal Integration

Active transportation is part of the overall transportation network, providing alternative forms of transportation for residents and visitors alike. Much of active transportation facilities are existing and planned for Buckeye within parks, or connecting open spaces, creating opportunities for recreational activity. While active transportation trails and pathways should be connected to one another, there should also be connections from these recreational facilities to the sidewalk network along roadways and within activity centers.

As noted in Section 4.2, there are different types of sidewalks that are located in the transportation network, including attached and detached sidewalks, as well as on-street and off-street bicycle facilities. These connections are important for creating pedestrian and cyclist connectivity throughout the City; however, they are also imperative for proving connections to other high capacity transportation options, such as buses, commuter rail. To support the transit system, sidewalks and paths should provide last mile connections as well as connections to transit hubs.

4.5 Relevant Active Transportation Plans

Active transportation networks have been identified by the City of Buckeye and other agencies. The City of Buckeye provided plans for paths and trails in the 2016 Parks and Recreation Master Plan, while MCDOT and MAG are currently in the process of providing plans for bicycle and pedestrian networks through their own Active Transportation Plans.

Table 4-3: Planned Path / Trail Facilities

Facility Type	Miles
Primary Trail/Path	115
Secondary Path	350

Source: City of Buckeye, 2016.

City of Buckeye Parks and Recreation Master Plan

The City of Buckeye adopted the Parks and Recreation Master Plan in 2016 which provides a framework for parks, paths, trails, and open spaces in Buckeye. The plan includes a robust network of planned trail and path facilities along washes, rivers, canals, utility corridors, and flood control channels and structures. The plan identified classifications of paths, including Primary Trail/Path, Secondary Path, and Accessible Trail, all of which should be ADA-accessible. The location of Primary Trails/Paths and Secondary Paths are displayed in **Figure 4-2** and the total mileage of each facility type is summarized in **Table 4-3**. The description of each classification of path or trail is as follows:

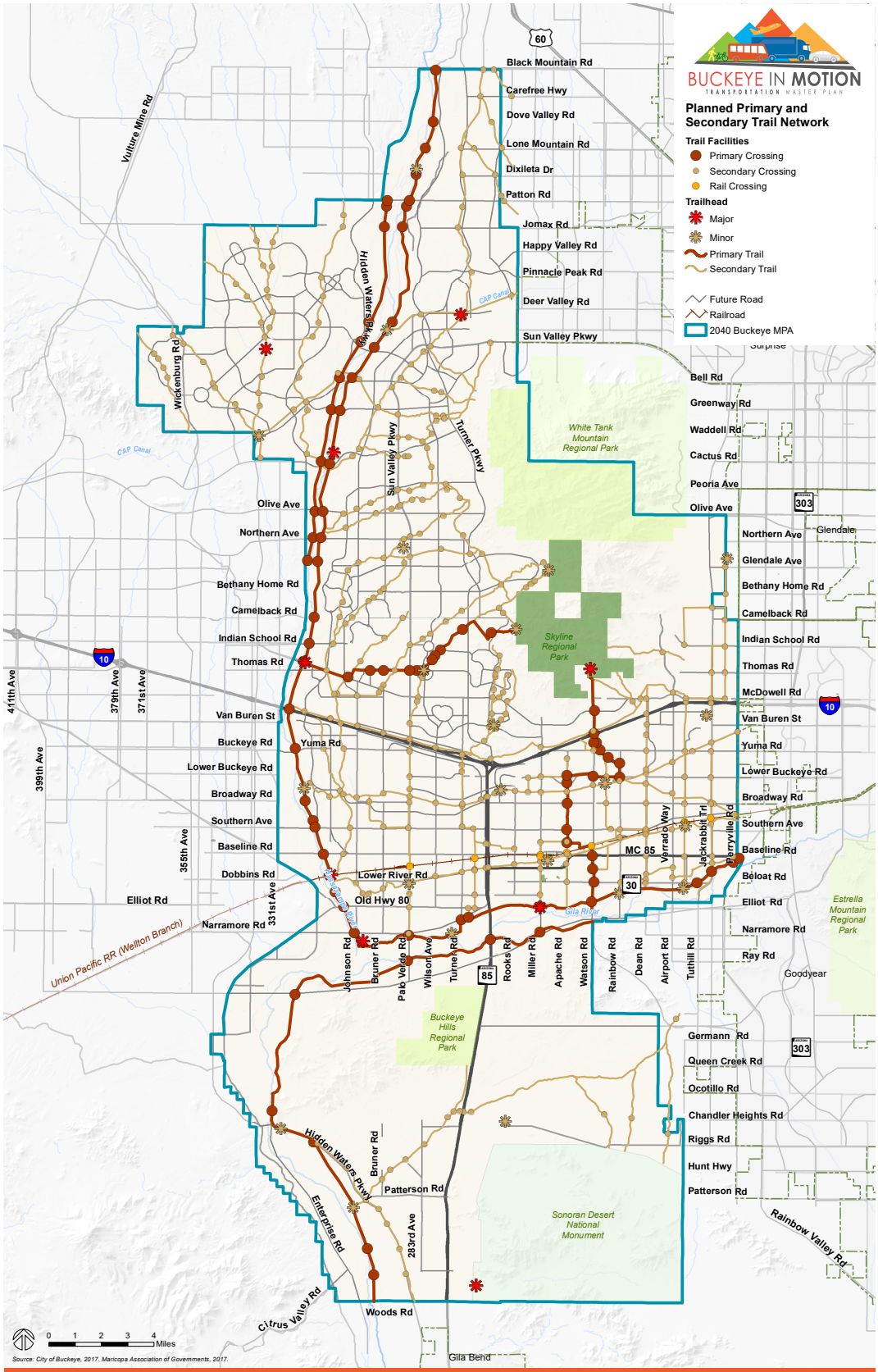

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Figure 4-2

Planned Primary and Secondary Trail Network

- **Primary Paths/Trails.** These provide the highest level of functionality for a wide range of users, including hikers, mountain bikers, and equestrians. Primary Paths/Trails incorporate both hard and soft surfaces to support a multitude of activities and are intended to connect regional parks and natural resources to communities, neighborhoods, and other major destinations.
- **Secondary Paths.** These facilities are intended for more localized use as they connect neighborhoods to community parks, schools, commercial nodes, and employment centers. Secondary paths have hard surfaces and serve both transportation and recreation needs.
- **Accessible Trails.** These trails consist of compacted and stabilized decomposed granite and allow for a more natural experience to users in developed areas of Buckeye. Accessible trails will predominately be constructed along powerline corridors.

The Parks and Recreation Master Plan also identifies the locations for primary and secondary trailheads, which are identified on **Figure 4-2**. In total, there are eight major (primary) trailheads and 21 minor (secondary) trailheads in Buckeye. The differences between major and minor trailheads include the size of trailhead, the amount of parking spaces, the provision of restrooms, lighting, and ramadas, and whether equestrian use is allowed.

The Parks and Recreation Master Plan provides 19 implementation measures over the next 10 years and the responsible parties, which include City departments, developers, sand and gravel companies, other governmental agencies, development communities, and homeowner associations. These implementation measures are being followed by the City of Buckeye to efficiently develop a city-wide trail network. These implementation measures will be an important consideration in development of the Bicycle and Pedestrian Master Plan.

MCDOT Active Transportation Plan

The MCDOT updated its Active Transportation Plan (ATP), which replaces the 1999 Bicycle Transportation System Plan. The ATP is the planning document for the active transportation network, which includes the pedestrian and bicycle network, and will guide decisions and investments for active transportation within unincorporated Maricopa County.

The MCDOT Active Transportation Plan identifies both pedestrian and bicycle facility needs throughout the county. **Table 4-4** lists the identified pedestrian and bicycle network needs in Buckeye and **Figure 4-3** and **Figure 4-4** show these needs respectively.

Table 4-4: MCDOT Active Transportation Plan Pedestrian and Bicycle Needs in Buckeye

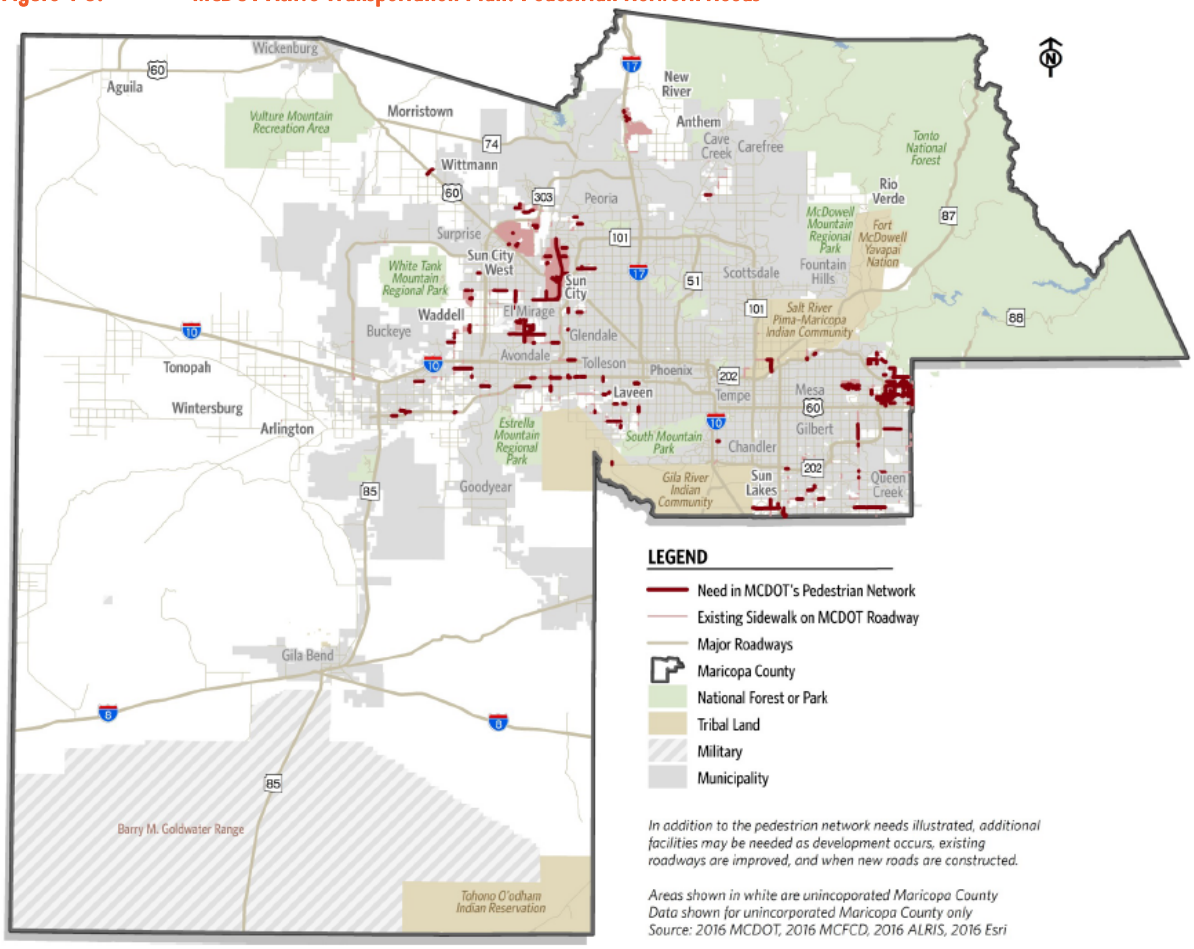
Location	Need
Pedestrian Network Needs	
195th Avenue from Minnezone Avenue to North of Minnezona Avenue	Sidewalk both sides
195th Avenue from South of Camelback Road to Camelback road	Sidewalk both sides
Baseline Road from 1st Avenue to MC 85	Sidewalk both sides
Durango Street from Watson Road to Rainbow Road	Sidewalk south side
Indian School Road from east of 107th Avenue to West of 103rd Avenue	Sidewalk both sides
Jackrabbit Trail from 201st Avenue to 195th Avenue	Sidewalk both sides
MC 85 and Jackrabbit Trail	Sidewalk SW and SE corners
MC 85 from 255th Avenue to Miller Road	Sidewalk both sides
Mc 85 from Ash Avenue to Baseline Road	Sidewalk both sides
MC 85 from Baseline Road to 129th Avenue	Sidewalk both sides
MC 85 from Jackrabbit Trail to West of 193rd Avenue	Sidewalk both sides
Van Buren Street and 191st Avenue	Sidewalk NW
Van Buren Street and Perryville Road	Sidewalks all corners
Van Buren Street from Jackrabbit Trail to 191st Avenue	Sidewalk north side
Bicycle Network Needs	
195th Avenue from Indian School Road to north of Colter Street	Bicycle facility
231st Avenue from Lower Buckeye Road to Durango Street	Bicycle facility
355th Avenue from I-10 to Wickenburg Road	Bicycle facility
355th Avenue from north of Piedmont Road to Dobbins Road	Bicycle facility

Table 4-4: MCDOT Active Transportation Plan Pedestrian and Bicycle Needs in Buckeye (continued)

Location	Need
Pedestrian Network Needs	
Camelback Road from 195th Avenue to Perryville Road	Bicycle facility
Dean Road from MC 85 to Buckeye Canal	Bicycle facility
Dean Road from south of Southern Avenue to Roosevelt Irrigation District Canal	Bicycle Facility
Dobbins Road from 355th Avenue to 331st Avenue	Bicycle facility
Elliot Road from Jackrabbit Trail to Rainbow Valley Road	Bicycle facility
Indian School Road from west of 192nd Lane to Perryville Road	Bicycle facility
Jackrabbit Trail from Elliot Road to M 85	Bicycle facility
Lower Buckeye Road from Dean Road to Perryville Road	Bicycle facility
MC 85 from Dean Road to Jackrabbit Trail	Bicycle facility
MC 85 from Ash Avenue to Dean Road	Bicycle facility
MC 85 from SR 85 to Miller Road	Bicycle facility
Palo Verde Road from Old US 80 to south of Buckeye Airport Road	Bicycle facility
Thomas Road from 195th Avenue to Perryville Road	Bicycle facility
Tuthill Road and Salt River	River crossing
Verrado Way from Lower Buckeye Road to Yuma Road	Bicycle facility
Ward Street from 331st avenue to Salome Highway	Bicycle facility
Wickenburg road from 355th Avenue to north of Central Arizona Project	Bicycle facility
Wickenburg Road from south of Vulture Mine Road to Vulture Mine Road	Bicycle facility

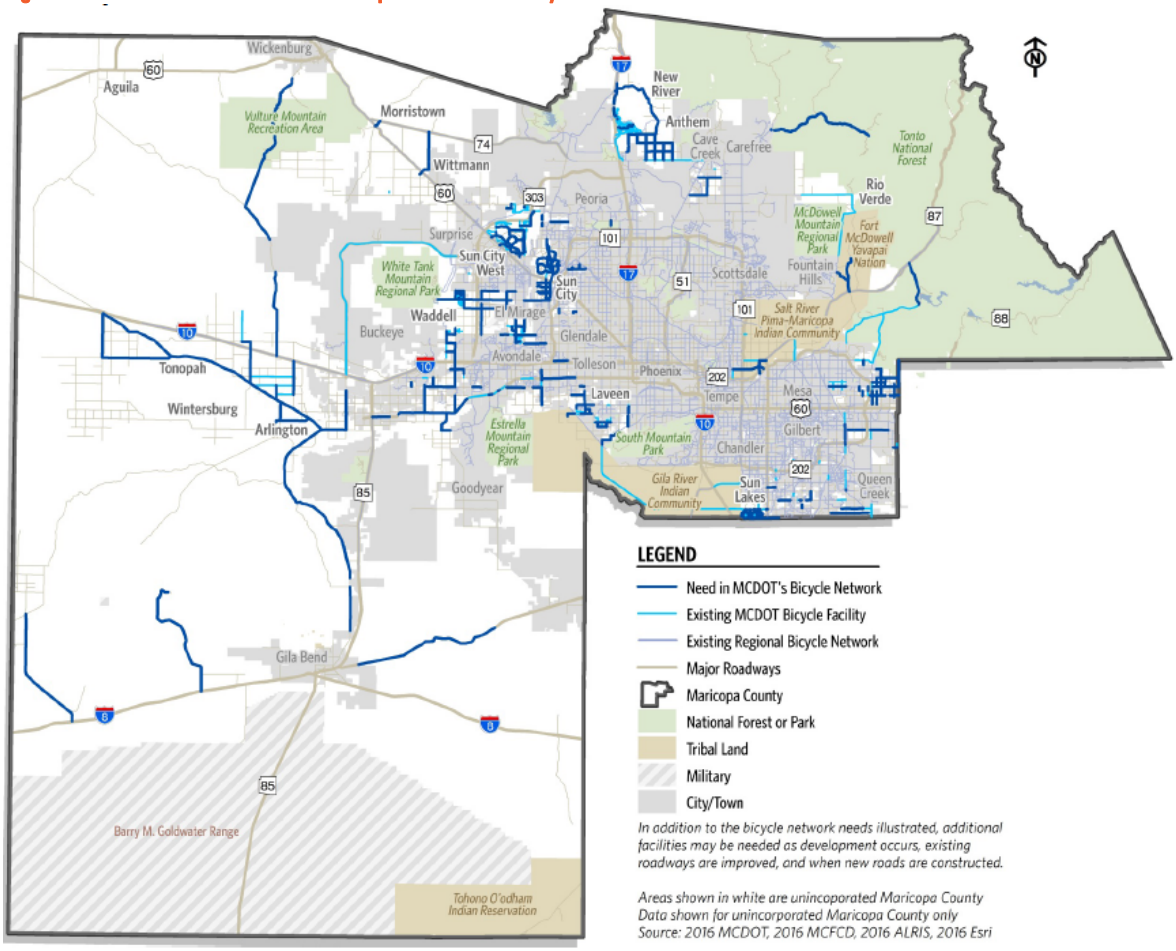
Source: MCDOT Active Transportation Plan, 2018.

Figure 4-3: MCDOT Active Transportation Plan: Pedestrian Network Needs



Source: MCDOT Active Transportation Plan, 2018.

Figure 4-4: MCDOT Active Transportation Plan: Bicycle Network Needs



Source: MCDOT Active Transportation Plan, 2018.

MAG Active Transportation Plan

MAG is currently in the process of creating an Active Transportation Plan, a regional plan that will guide a regional bicycle and pedestrian network. The Plan will identify potential new routes and investments for bicycle and pedestrian connections. Plan recommendations are anticipated in Summer 2019 and will be evaluated by the City.

4.6 Factors Influencing Active Transportation

Demand for active transportation is derived from consideration of several factors including healthy community indicators, latent demand for active transportation, active transportation trip types, and safer streets and safer communities. Each of these factors will be important considerations in the Bicycle and Pedestrian Master Plan process.

Healthy Community Indicators

Public health and urban planning research indicates that impacts of automobiles on public health extend beyond air quality concerns to concerns about a lack of physical activity resulting from auto-oriented development patterns. The resulting consequence is various health-related issues including obesity and other chronic diseases such as coronary heart disease, stroke and diabetes. Research also indicates that pedestrian- and bicycle-friendly environments often leads to a more active and healthy lifestyle. As a result of this research many public health professions and organizations have begun advocating for the creation of pedestrian-friendly and bicycle-friendly communities. Healthy Community Indicators are measurable ways of encouraging improved public health conditions. Health Community Indicators include access to recreation and open space, community design, and air quality. Each of these Healthy Community Indicators are described below.

- **Access to recreation and open space.** Residents who live near or have access to open space and recreation areas have been shown to have reduced risks of heart disease, stress, and an improved mood by giving residents the opportunity to participate in active lifestyles. In addition to park facilities, the provision of sidewalks, paths, trails, and bicycle facilities provide an important link in the open space network, connecting residents to a City's many recreation facilities and open spaces.
- **Community design.** The design of the built environment, including transportation facilities, affects how residents utilize the City and engage in the community. On average a community's transportation network comprises approximately 20% of a city's limits. Furthermore, on average, the transportation network consists of approximately 80% of all land owned by a city. Therefore, the transportation network provides a unique opportunity to influence community design. The Bicycle and Pedestrian Master Plan should provide context sensitive solutions that support community design goals.

- **Air quality.** Maintaining good air quality is necessary for the overall health of the community as well as the attractiveness of the City. Air quality can also affect residents' ability to have active lifestyles. When a person chooses to walk or bike they are typically removing one car from the road. With a more appealing biking and walking environment a larger number of local trips can safely be made on foot, including shopping, restaurants, school, and recreational trips. This change in transportation choice has a positive cumulative impact on improving air quality and reducing congestion. Poor air quality and air pollution have public health consequences including asthma and other respiratory conditions.

These three indicators are significant in planning active transportation networks and is being considered in the Bicycle and Pedestrian Master Plan. As Buckeye continues toward their goal of becoming a bike-friendly and pedestrian-friendly community, the City will witness a higher proportion of residents choosing to exercise and achieve increased activity levels.

Latent Demand for Active Transportation

Latent demand is a methodology to determine when infrastructure is built if individuals will use it. Understanding areas within Buckeye with the highest opportunity for active transportation trips is critical for developing a multimodal transportation network and in determining high priority areas. Furthermore, prioritizing where people are most likely to walk or bike can be an effective way to prioritize implementation and funding. By understanding a combination of factors including infrastructure, land use types, and population information, the City can determine where active transportation trips are most likely to occur. Origin and destination information help to determine where trips are generated and where trips need to reach. Provided in Table 4-5 are common origin and destination factors in determining latent demand for active transportation. These factors should be considered in the Bicycle and Pedestrian Master Plan.

Table 4-5: Active Travel Origin and Destination Locations

Origins	Destinations
▶ Population Density	▶ Schools
▶ Employment Density	▶ Transit Stops
▶ Low- and Moderate-Income Block Groups	▶ Civic Facilities (post office, library, government buildings)
▶ Percent who Walk, Bike, or Use Transit to Commute to Work	▶ Commercial Land Use
▶ Percent of Zero-Vehicle Households	▶ Active Open Space and Parks
▶ Density of Children (16 and under)	▶ Activity Centers
▶ Density of Seniors (65 and older)	
▶ Density of People with Disability	

Active Transportation Trip Types

Active transportation systems typically consist of three common trip types: commuting, recreation (both on-road and off-road), and local trips. Commuters are those that use active transportation facilities as a means to get to work or school. Recreational users are those that use active transportation facilities for exercise or enjoyment. Local trip users are those that use active transportation facilities as a means to get to shopping, healthcare, entertainment, and other daily activities. Each active transportation facility user not only prefers different facility types but also utilizes facilities differently. Public engagement during the Bicycle and Pedestrian Master Plan will provide valuable insights into the existing common trip types and evaluate if additional constructed facilities would generate additional trips. This will be an important consideration in prioritizing various facility types in the Bicycle and Pedestrian Master Plan.

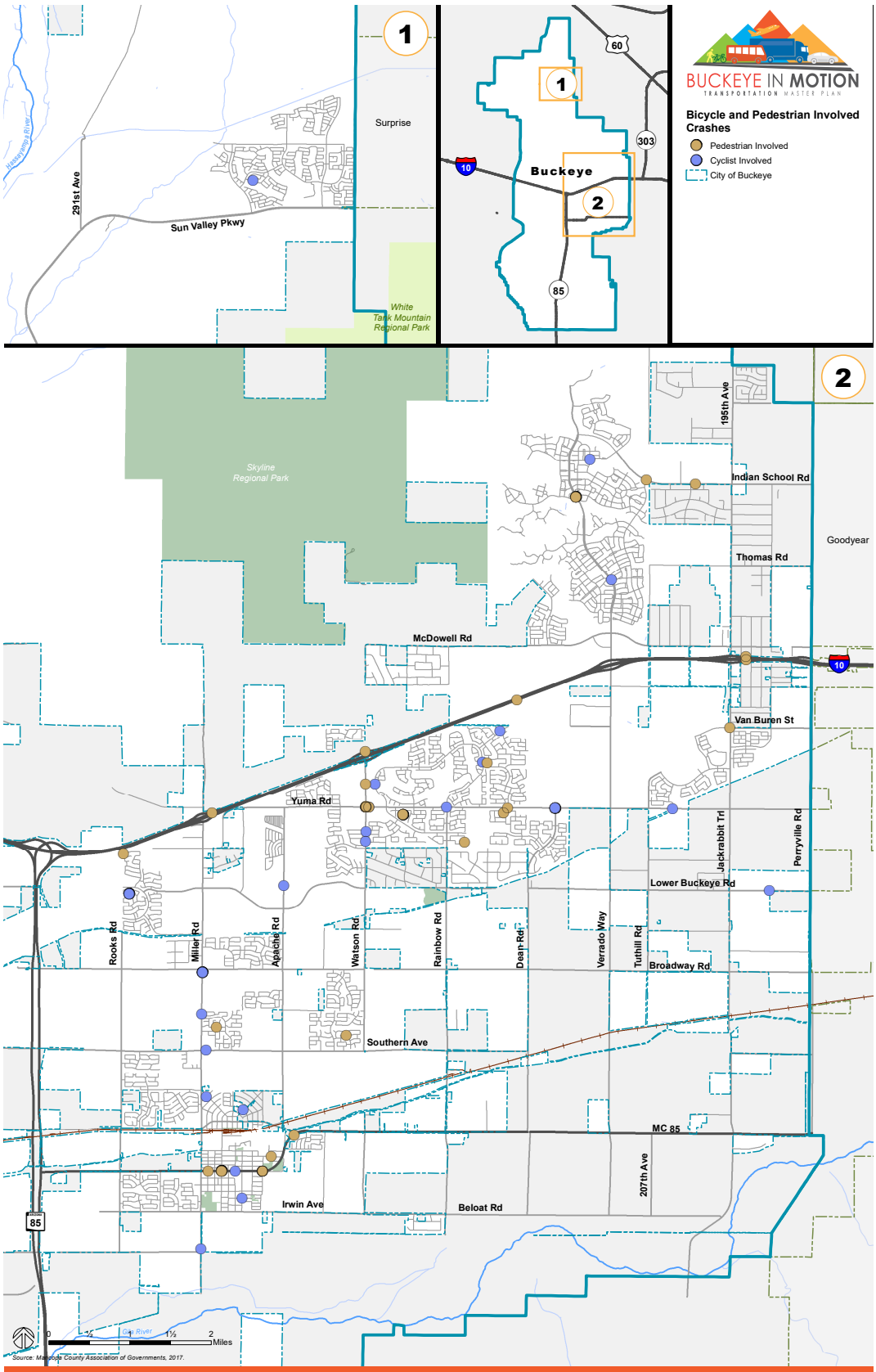
Bicycle and Pedestrian Friendly Communities

Targeting pedestrian and bicycle improvements to accommodate older adults, the disabled, and children often results in higher pedestrian and bicycle counts due to improved LOS. Additionally, properly designed pedestrian facilities can also improve mobility and access for persons with disabilities. Many communities are upgrading existing sidewalk and path facilities to meet the latest Public Right-of-Way Accessibility Guidelines (PROWAG) standards and enhance urban design elements. Improving pedestrian crossings, providing seating, and improving lighting, signage and pavement markings are all beneficial improvements for communities and improve pedestrian and bicycle LOS for all users.

Streets designed to accommodate pedestrians and bicyclists often result in safer conditions for all roadway users. Additionally, these streets often include other measures that are targeted to reduce vehicle travel speeds and provide access control. All of these measures collectively can significantly reduce the number of conflicts that occur along a roadway, particularly at driveways and intersections. These LOS factors will be important considerations in the Bicycle and Pedestrian Master Plan.

Bicycle and Pedestrian Involved Crashes

Bicycle and pedestrian crash data is important to analyze, strategize, and determine if adjustments are necessary to improve active transportation. MAG crash data (2012-2017) was queried to determine locations of bicycle and pedestrian involved crashes. In these five years (2012-2017), 17 pedestrian-involved crashes were reported on roadways owned and maintained by the City of Buckeye, whereas, 22 bicycle-involved crashes were reported in this same period.



Matrix DESIGN GROUP

Figure 4-5
Bicycle and Pedestrian Involved Crash Locations

All pedestrian- and bicycle-involved crashes between 2012 and 2017 are listed in **Table 4-6** and illustrated in **Figure 4-5**. Of the crashes resulting in fatalities, two incidences involved a pedestrian and one involved a cyclist. Of the crashes resulting in an incapacitating injury, three incidences involved a pedestrian and three involved a cyclist. This data is useful in applying for several funding sources, but more importantly, in determining if and where a pedestrian or bicycle facility is needed or needs improvement.

Table 4-6 indicates the jurisdiction responsible for the roadway where the crash occurred. Solutions for incidences occurring on I-10 would be addressed by the Arizona Department of Transportation (ADOT) in consultation with the Federal Highway Administration (FHWA). The Federal Highway Authority (FHWA) recommends a comprehensive approach to identifying solutions for high crash locations. These solutions should include the six E's associated with active transportation identified by the League of American Bicyclists:

1. **Education** – Giving people of all ages and abilities the skills and confidence to ride
2. **Encouragement** – Creating a strong bicycle culture that welcomes and celebrates bicycling
3. **Enforcement** – Ensuring safe roads for all users
4. **Evaluation and Planning** – Planning for bicycling as a safe and variable transportation option
5. **Equity** – Support safe, active, and healthy opportunities for all trail and path users
6. **Engineering** – Creating safe and convenient places to ride and park

These six areas reflect the multidisciplinary nature of transportation safety. Incorporating elements of the 6 E's into the planning process can continue to contribute to reduced crashes, injuries, and fatalities.

Four locations are within Buckeye city limits but are on MCDOT owned and maintained roadways. In these instances, solutions would be addressed by MCDOT. In total, 33 locations are on roadways owned and maintained by the City of Buckeye. The Bicycle and Pedestrian Master Plan should examine the six high priority locations (those resulting in incapacitating injury or fatality on Buckeye roads) to determine if solutions are needed.

Table 4-6: Active Transportation Crash Locations, 2012-2017

Crash Location	Jurisdiction	Incapacitating Injury	Fatality	Non-Injury
Pedestrian Involved				
I-10, west of Verrado Way	ADOT/FHWA	●		
I-10, west of Jackrabbit Trail	ADOT/FHWA		●	●
I-10 and Rooks Road	ADOT/FHWA			●
I-10 and Miller Road	ADOT/FHWA			●
I-10 and Watson Road	ADOT/FHWA			●
237th Drive, north of Southern Avenue	City of Buckeye			●
Baseline Road and MC 85	MCDOT			●
Dean Road and Yuma Road				●
Dove Trail, east of Miller Road	City of Buckeye	●		
Indian School Road and Acadia Way	City of Buckeye			●
Indian School Road and 199th Avenue	City of Buckeye			●
Hopi Street at Rainbow Road	City of Buckeye			●
MC 85 at 2nd Street	City of Buckeye			●
MC 85 at 4th Street	City of Buckeye			●
MC 85 at 9th Street	City of Buckeye			●
MC 85 and Watson Avenue	MCDOT			●
MC 85 and 4th Street	City of Buckeye	●		
Papago Street and 231st Lane	City of Buckeye			●
Sundance Parkway and Harrison Street	City of Buckeye			●
Van Buren Street and Jackrabbit Trail	MCDOT			●
Verrado Way and Lost Creek Drive	City of Buckeye			●
Watson Road at Sundance Parkway	City of Buckeye	●		
Watson Road, north of Yuma Road	City of Buckeye			●
Watson Road at Yuma Road	City of Buckeye		●	●

Table 4-6: Active Transportation Crash Locations, 2012-2017 (continued)

Crash Location	Jurisdiction	Incapacitating Injury	Fatality	Non-Injury
Bicycle Involved				
6th Street and South Avenue	City of Buckeye			●
224th Drive	City of Buckeye			●
Apache Road, north of Lower Buckeye Road	City of Buckeye			●
Deniza Boulevard and 3rd Avenue	City of Buckeye			●
Lower Buckeye Road, east of Jackrabbit Trail	MCDOT	●		
Marco Polo Road, north of Sun Valley Parkway	City of Buckeye			●
MC 85 and 5th Street	City of Buckeye			●
Miller Road at Dove Cove Drive	City of Buckeye	●		
Miller Road and Southern Avenue	City of Buckeye			●
Miller Road and Maricopa Road	City of Buckeye			●
Miller Road and Hazen Road	City of Buckeye			●
Miller Road and Broadway Road	City of Buckeye	●		
Sundance Parkway and Sundance Avenue	City of Buckeye			●
Sunrise Lane, east of Verrado Way	City of Buckeye			●
Van Buren Street and 221st Avenue	City of Buckeye			●
Verrado way and Thomas Road	City of Buckeye			●
Watson Road and Hagar Street	City of Buckeye			●
Watson Road, north of Durango Street	City of Buckeye			●
Winslow Avenue and 258th Drive	City of Buckeye	●		
Yuma Road at the canal crossing	City of Buckeye		●	
Yuma Road and Dean Road	City of Buckeye			●
Yuma Road and Rainbow Road	City of Buckeye			●
Yuma Road at Watson Road	City of Buckeye	●		

Source: Maricopa Association of Governments, 2017.

4.7 Active Transportation Recommendations

The future active transportation network will provide a user friendly and connected bicycle and pedestrian network. The City is undertaking the first ever Bicycle and Pedestrian Master Plan which was funded by a combination of MAG and City funds. The Bicycle and Pedestrian Master Plan will complement the Transportation Master Plan and the Parks and Recreation Master Plan and should be referenced for all bicycle and pedestrian planning and implementation efforts. The Bicycle and Pedestrian Master Plan will identify projects, programs, policies, and performance measures for short- and long-term implementation.

Although a more detailed set of recommendations will be provided in the Bicycle and Pedestrian Master Plan, the following are recommendations that will guide the Bicycle and Pedestrian Master Plan process. The future active transportation network will consist of on-street facilities, off-street facilities, and other supporting facilities; each of which will be further examined in the Bicycle and Pedestrian Master Plan.

On-Street Facilities

On-street bicycle facilities typically include bike route, bike lanes, paved shoulders, cycle tracks, and bike boulevards, among other potential facility types. On-street bicycle and pedestrian facilities should be implemented on collector and some arterial roadways.

Collector Roadways

Collector roads provide low-stress routes for a bicycle and pedestrian network. Existing and future collectors should be assessed for preferred routes and best practice guidance should be developed to create a safe and low-stress on-street bicycle and pedestrian transportation network. Collector roadways are the preferred facility for the bicycle and pedestrian network.

Arterial Roadways

Although arterial roadways often create high-stress environments for pedestrians and bicyclists, in some instances they may be recommended as the best route for network connectivity and to fill essential gaps in the bicycle and pedestrian network. Furthermore, arterial roadways are often the location of key destinations in a community including commercial developments and transit stops. The arterial network should be assessed to identify arterials that will be essential to creating a complete bicycle and pedestrian network.

Street Cross-Sections

The City's existing street design standards for collector and arterial roadways include sidewalks and striped bicycle lanes. In addition to these existing street design standards, the City should develop street cross-sections for a variety of land use contexts (i.e. rural areas, suburban areas, and activity centers).

In summary, the Bicycle and Pedestrian Master Plan should provide best practice guidance for long-term implementation including identifying where on-street facilities are needed in the arterial and collector network, identifying the type of facility recommended, and identifying a variety of cross-sections to be implemented throughout the changing landscape of Buckeye.

Off-Street Facilities

Off-street facilities (trails and multi-use paths) provide low-stress and recreational routes for a bicycle and pedestrian network. Multi-use paths are off-street facilities reserved for the use of pedestrians and bicyclists exclusively and typically consist of a paved surface treatment. Multi-use paths can serve local trips and are preferred by non-experienced cyclists, pedestrians, and equestrians. Conversely, a trail is also a recreational facility but has an unpaved surface treatment (i.e. crushed gravel or dirt). Trails are typically designed for recreational riders and do not serve local trip options. Trail users can include pedestrians, non-experience cyclists, experienced cyclists (i.e. mountain bike riders), and equestrians.

In the Bicycle and Pedestrian Master Plan, locations of planned off-street facilities should be identified to determine which off-street facilities are already planned for the future. In areas where off-street facilities are not planned, Wildlife Linkages, powerline corridors, irrigation corridors, washes, channels, and the Buckeye Parks and Recreation Master Plan should be used to identify additional future off-street facilities. The Bicycle and Pedestrian Master Plan should provide best practice guidance including typical cross-sections and safe roadway crossing designs.

Supporting Facilities

Planning for bicycle and pedestrian improvements involves identifying both route improvements as well as improvements at key points in the transportation network. The Bicycle and Pedestrian Master Plan is identifying the following:

- Targeted improvements in areas where the City should pursue additional funds to execute design improvements.
- Best practices in roadway crossings as well as transit accessibility improvements to support a truly multimodal network and address safety concerns at locations with pedestrian- and bicycle-involved crashes that resulted in serious injuries or fatalities.
- A signage program to be implemented in phases or over time as areas of Buckeye are developed.

4.8 Implementation and Funding

Implementation

Recommendations in this Active Transportation Chapter should be further examined in the forthcoming Buckeye Bicycle and Pedestrian Master Plan. The recommendations to be identified will focus on roadways owned and maintained by the City of Buckeye. In addition to bicycle and pedestrian projects, the Bicycle and Pedestrian Master Plan will also identify policies, programs, and performance measures. Furthermore, local and regional partners will be engaged to determine potential strategies for cooperative implementation. Each of these items are further described below.

Partner Engagement

Engaging the community in planning for a future active transportation network is a key component of the Buckeye Bicycle and Pedestrian Master Plan. This partner engagement includes elected/appointed officials, City staff, elementary schools, homeowner's associations, cycling clubs, developers, MAG, MCDOT, neighboring municipalities, UPRR, Maricopa County, AZGFD, conservatory groups, US Corps of Engineers, APS, Roosevelt Irrigation District, Buckeye Water Conservation and Drainage District, and the general public. Providing for partner engagement not only better informs the planning process but also establishes project champions that will advocate for the ongoing implementation of bicycle and pedestrian infrastructure.

Projects

The Bicycle and Pedestrian Master Plan should categorize improvements including the type of facility and location of facility. Furthermore, an Implementation Matrix should provide project priorities, cost estimates, phasing, funding sources, partners, and jurisdictional roles and maintenance of the recommended improvements.

Policies

Active Transportation policies provide an additional means for incremental implementation of an active transportation network. Effective active transportation policies will dictate the intention for both publicly-paid and privately-paid infrastructure and will document the established exceptions to the policies. The Bicycle and Pedestrian Master Plan should consider existing and future policies, department procedures, and design standards and guidelines that promote safe accommodation of active transportation facilities.

Programs

Often referred to as the "6 Es" of transportation safety practices, promoting safe active transportation through Education, Encouragement, Evaluation, Enforcement, Equity, and Engineering is a proven technique to promote safe interactions between pedestrians, bicyclists, equestrians, and vehicles. The Bicycle and Pedestrian Master Plan will identify best practices, guidance, and strategies to be undertaken as programs by the City of Buckeye.

Performance Measures

Performance measures are an effective way to evaluate progress and effectiveness in implementing the active transportation network. Performance measures can be divided into one of two types: inventory measures or outcome measures. Inventory measures are easy to calculate. Examples of inventory measures might include miles of trails, sidewalks, or bike lanes constructed or the number of pedestrian lighting units installed. Outcome measures are more difficult to quantify as they require a deliberate intention to measure before and after construction. Examples of outcome measures might include change in pedestrian- and bicycle-involved crashes, change in pedestrian and bicycle counts conducted, change in sales tax generated, or change in property values. The Bicycle and Pedestrian Master Plan should identify active transportation performance measures that will allow the City of Buckeye to measure progress and effectiveness in implementing the Bicycle and Pedestrian Master Plan.

Funding

Funding for active transportation can come from a variety of sources including City funds, private funds (philanthropic or developer-paid), and federal and state funds passed through MAG. Traditional government funding opportunities are summarized below.

Federal Funds

Several federal funding sources can be used to fund active transportation infrastructure. For Buckeye, these funds would be applied for through the MAG Transportation Improvement Program (TIP). These federal funding sources include the Congestion Mitigation and Air Quality (CMAQ) Program and the Surface Transportation Block Grant (STBG) Program which includes the Transportation Alternative (TA) Set-Aside and the Recreation Trails Program (RTP). Each of these programs are described below.

CMAQ provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). As of February 2017, Maricopa County is in nonattainment for ozone and particulate matter. Funds in this program

can be used for an active transportation project or program that has the potential to contribute to the attainment or maintenance of a NAAQS. The project or program should be effective in reducing air pollution and should be included in the MAG's current transportation plan and TIP.

STBG funds include two set-aside programs: Transportation Alternatives (**TA**) and Recreational Trails Program (**RTP**). The **TA** set-aside funds are authorized for transportation alternatives, including:

- On- and off-road pedestrian and bicycle facilities
- Infrastructure projects for improving non-driver access to public transportation and enhanced mobility
- Community improvement activities such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity
- Recreational trail projects
- Safe routes to school projects
- Projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former divided highways

The **RTP** is a set-aside within the TA set-aside. The RTP provides funds to develop and maintain recreational motorized and nonmotorized trails and trail-related facilities, including facilities for hiking, bicycling, equestrian use, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, and other off-road motor vehicles.

Regional Funds

In addition to CMAQ and STBG funds, the Maricopa Association of Governments (MAG) has three funding programs that can be utilized for active transportation projects. These funding sources include the Safe Routes to School (SRTS) Program, the Bicycle and Pedestrian Design Assistance Program, and the Bicycle and Pedestrian Master Plans and First Time Updates Program. Each of these programs are summarized below.

The **SRTS Program** provides resources for schools and municipalities to administer Safe Routes to School (SRTS) initiatives and activities such as:

- Crossing Guard training workshops;
- Programming of Transportation Alternative SRTS federal aid funding; and
- Administration of SRTS Studies Projects.

The MAG region receives an annual allocation of federal aid for transportation alternatives from ADOT. MAG member agencies are eligible to submit applications on behalf of a requesting school district to utilize these funds for projects that will help schools and communities promote the health and safety of students. MAG allocations fund qualifying SRTS non-infrastructure projects.

The **Bicycle and Pedestrian Design Assistance Program** involves an application process where local governments compete for funding. Project applications are evaluated by the MAG Active Transportation Committee via an objective scoring process. The highest scoring projects receive funding to complete a scoping study, project assessment, or preliminary engineering for bicycle or pedestrian infrastructure projects. Eligible projects include regional shared-use paths or canal paths, bicycle and pedestrian access to transit, and bicycle and pedestrian facilities.

The **Bicycle and Pedestrian Master Plan and First Time Updates Program** involves an application where local governments compete for funding. Interested municipalities submit an application indicating their need to conduct a bicycle and pedestrian master plan. Applications are evaluated by the MAG Active Transportation Committee via an objective scoring process and the highest scoring applications receive funding to complete. The City of Buckeye will utilize this funding source to complete the Bicycle and Pedestrian Master Plan.

4.9 Summary

When people chose to walk, bike, or do other activities such as hiking or equestrian activities, they increase the likeliness of chance meetings with other members of the community, which build neighborhood and community relationships. Additionally, improving bicycling and walking conditions significantly improves economic conditions in communities. Numerous studies have demonstrated significant improvements in consumer cost savings, increased property values, and improved access to jobs, in addition to greater accessibility for low- and moderate-income families. Other studies have found the related costs for road maintenance, public parking, traffic congestion, and crashes can be significantly reduced by shifting vehicular trips to non-motorized trips.

This Active Transportation Chapter provides a foundation for the future effort of completing the first Bicycle and Pedestrian Master Plan for Buckeye. Plan recommendations include identification of projects, in the form of on-street facilities, off-street facilities, and other supporting facilities, as well as the identification of policies, programs, and performance measures. Each of which will provide valuable guidance for effective plan implementation as Buckeye continues to grow and develop.

Please see the next page.

AVIATION CHAPTER 5

5.1 Introduction

Aviation services provide regional, national, and international access, enhancing convenient and proximate resident and visitor travel to and from Buckeye, as well as economic development through commercial and employment uses. This Chapter establishes a recommended plan of action for the maintenance and enhancement of aviation services within the City of Buckeye.

The primary facility providing aviation services in Buckeye is the Buckeye Municipal Airport, which is owned and operated by the City of Buckeye. The Imagine Buckeye 2040 General Plan establishes goals and policies for the expansion of the Buckeye Municipal Airport to serve Buckeye into the future. Additionally, the General Plan identifies an economic development opportunity to establish the Buckeye Airport Employment Activity Center near the municipal airport. This activity center is envisioned as a regional employment and retail hub, anchored by the airport. The expansion of the municipal airport will provide a catalyst for the growth and development of the activity center and increasing economic development within the city.

Included in the Aviation Chapter are six sections:

- Section 5.1 **Introduction**. Aviation Chapter purpose and contents.
- Section 5.2 **Existing Airports and Military Installations.** Existing local and regional aviation services to the City of Buckeye.
- Section 5.3 **Imagine Buckeye 2040 General Plan.** Aviation and related Land Use Goals and Policies of the General Plan.
- Section 5.4 **Multimodal Integration.** Strategies for integration of aviation services into the larger transportation system.
- Section 5.5 **Previous Aviation Plans.** Previous plans and studies relative to aviation services within the City of Buckeye.
- Section 5.6 **Aviation Plan Recommendations.** Actions, strategies and recommendations to maintain and enhance aviation services in and to the City of Buckeye.
- Section 5.7 **Aviation Implementation and Funding.** Implementation program and potential funding sources to implement the recommendations of this Chapter.
- Section 5.8 **Summary.** Summary of the Aviation Chapter.

5.2 Existing Airports and Military Installations

Convenient and proximate access to air services is an integral component of a diverse and vibrant economy. Buckeye is served locally by the Buckeye Municipal Airport, and regionally by Sky Harbor International Airport. Luke Air Force Base and the Phoenix Goodyear Airport exist to the east of the Buckeye Municipal Planning Area. Coordinated aviation planning is necessary to ensure growth of aviation services in Buckeye which augment and expand resident, visitor and business transportation to regional, national and international locations and markets.

This section provides the descriptions and operational characteristics for the three largest airports in or just outside of the Buckeye municipal planning area (Buckeye Municipal Airport, Luke Air Force Base, and Phoenix Goodyear Airport). Due to the proximity between these large airports and military installation, it is important to ensure that flight operations of facilities remain safe and compatible by maintaining coordinated airspace. **Figure 5-1** shows the existing airports in the Buckeye MPA and in the immediate surrounding area.

A summary of the primary aviation facilities within or near the City of Buckeye are provided in the following subsections.

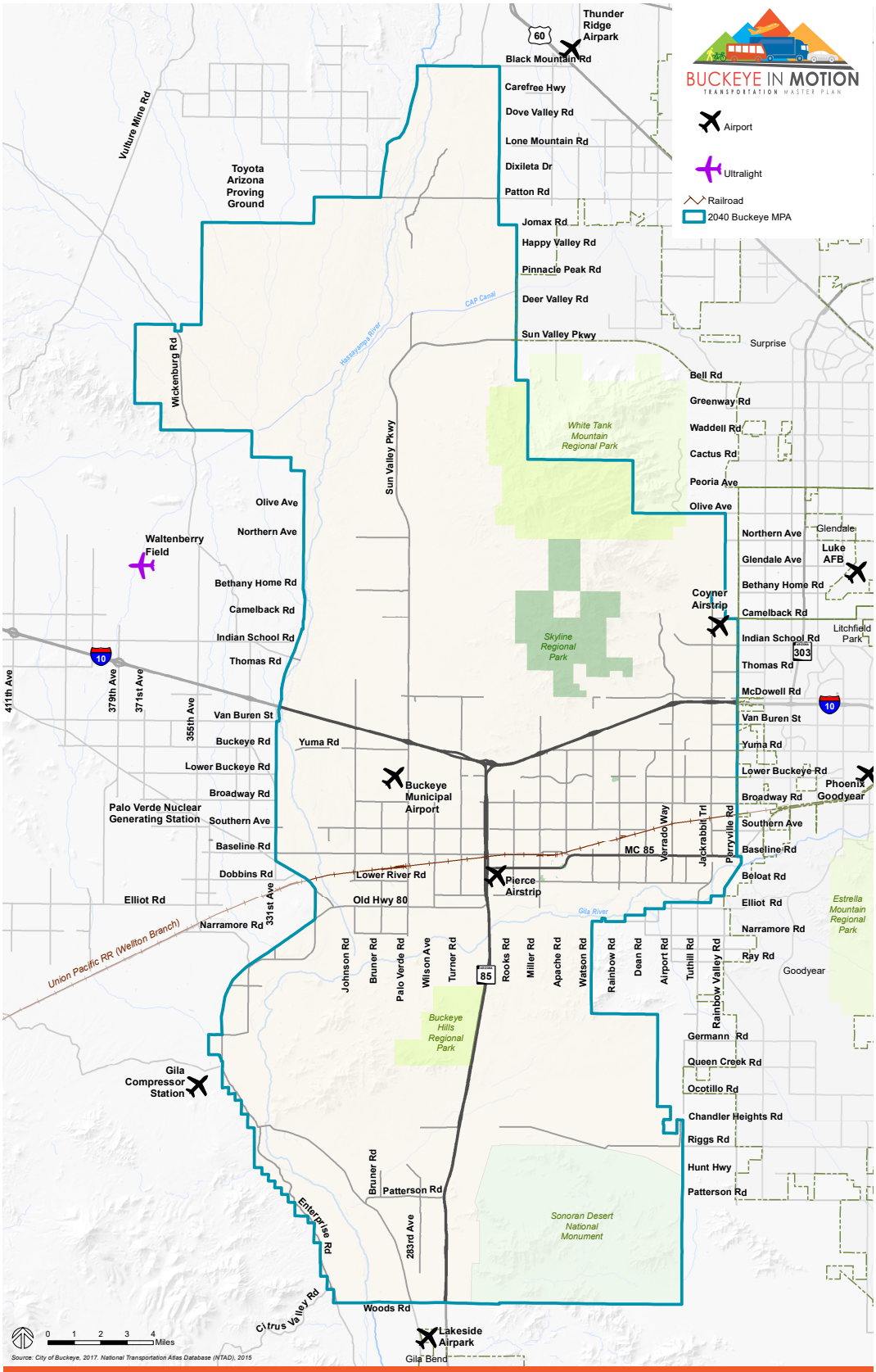


Figure 5-1
Existing Airports

Buckeye Municipal Airport

The City of Buckeye owns and operates the Buckeye Municipal Airport, located south of I-10 and west of SR 85. The municipal airport currently has a single runway which is designed for general aviation operations on approximately 700 acres. **Figure 5-2** illustrates the existing Buckeye Municipal Airport.

In terms of aviation operations, the majority of trips (70%) are itinerant trips from aircraft with a destination or origin away from the airport. The remaining 30% is comprised of local trips performed by aircraft that operates in sight of the airport. In 2015, the airport had an average of 145 aviation operations per day.

A variety of services and programs are offered at the Buckeye Municipal Airport, such as aircraft storage and self-serve fuel. Aviation related businesses are located within the airport, including: Sky Dive Buckeye, LLC, which provide parachute training and skydiving opportunities for the general public. In addition, Arizona Public Service (APS) leases part of a hangar at the airport for emergency preparedness related to the Palo Verde Nuclear Generating Station. Additional businesses are anticipated to open at the airport in the near future, including aircraft maintenance services and Fixed Base Operations (FBO), further contributing to the economic development of the area.

The airport is an economic focus area for the city, based on the opportunity for business sector expansion and increased travel options for residents and visitors to the City of Buckeye. Improvements to the airport have been completed over time, guided by the 2007 Buckeye Municipal Airport Master Plan. This plan includes a recommendation for an additional runway to increase capacity at the airport, which will serve as a catalyst for future economic development providing jobs and services within the local economy. The recently completed Imagine Buckeye 2040 General Plan includes an Implementation Action to complete a new airport master plan to update the vision, recommended improvements, and operational plan for the municipal airport. It also identifies the land surrounding the airport as a future planned activity center or hub for future employment and retail uses. This activity center is further described in Section 5.3.

Phoenix Sky Harbor International Airport

Phoenix Sky Harbor International Airport (Sky Harbor) is owned and operated by the City of Phoenix and is the primary airport serving the Phoenix metropolitan area supporting travel for an average of 120,000 passengers a day and over 800 tons of commercial cargo. Sky Harbor serves more than 100 domestic and international destinations with 1,200 daily flights.

Sky Harbor has a 30-nautical mile Class B restricted air space. The Buckeye Municipal Airport is outside of the Sky Harbor restricted airspace and air operations at the airport are not required to be coordinated with Sky Harbor. Additionally, as the Buckeye Municipal Airport is outside of the restricted air space for Sky Harbor, the planned expansion of the Buckeye Municipal Airport should not impact air operations at Sky Harbor.

Figure 5-2: Existing Buckeye Municipal Airport

Exhibit 1A
EXISTING FACILITIES

Luke Air Force Base

Luke Air Force Base (AFB) is a U.S. Air Force (USAF) base located within the city limits of Glendale, Arizona approximately four miles from the City of Buckeye planning boundary. Known as a primary training base of the Air Education and Training Command (AETC), Luke AFB is home to the 56th Fighter Wing. Considered the largest fighter wing in the world, Luke AFB has over 135 F-16's assigned and trains approximately 300 fighter pilots and 350 maintenance technicians a year. In 2014, Luke AFB was assigned 144 F-35 Lighting II fighter jets from the Lockheed martin factory in Fort Worth, Texas. Currently there is approximately 20 F-35 jets at Luke AFB, with the remaining aircraft scheduled to be deployed to Luke AFB over the next decade.

Joint Land Use Studies and Compatibility Studies were conducted for Luke Air Force Base in 2003 and provide the latest guidance on the future of this air facility. Luke AFB has two parallel runways, each of which has associated safety zones, called Clear Zones (CZs) and Accident Potential Zones (APZ). The safety zones impact the types and density of development in those zones. Such limitations on development can influence the types of roadways and modes of transportation in these areas. CZs exist primarily on-base, but some areas do extend off-base into unincorporated Maricopa County lands. Luke AFB APZs extend northeast into unincorporated Maricopa County and El Mirage, and southwest into Buckeye, the county, and Goodyear.

In terms of noise impact, associated noise contours extend into nearby residential communities, with high noise zones occurring throughout areas of Buckeye, El Mirage, Goodyear, and unincorporated Maricopa County land. Flight operations and training range areas are crucial components of military installations and their approach to land use compatibility with surrounding communities. Although not located in the City of Buckeye, flight tracks associated with Luke AFB and Luke Auxiliary Field #1 have the potential to impact Buckeye through noise and safety concerns as well as any future operations at Buckeye Municipal Airport. As noted in the section on Buckeye Municipal Airport, future operations should consider potential impacts to the military mission at Luke AFB.

Phoenix Goodyear Airport

The Phoenix Goodyear Airport is located approximately 18 miles from the Buckeye Municipal Airport in Goodyear, although it is owned and operated by the City of Phoenix. When originally built, the facility served various naval air and military functions until it was converted to a public airport in 1968. The airport does not include commercial passenger service; however, it is a storage and maintenance location for commercial airlines that operate out of Phoenix Sky Harbor International Airport. Additionally, the airport includes general aviation, corporate, and industrial aviation operations.

The Phoenix Goodyear Airport Master Plan is currently underway. A Draft Master Plan was published in April 2018, which does not indicate any future runway extensions. Nonetheless, the plans for extending Buckeye Municipal Airport runway must be coordinated with Phoenix Goodyear Airport, which has a Class D airspace, to ensure that future operations do not alter the airspace in which the Buckeye Municipal Airport currently falls under (Class E), which could potentially impact flight operations. Class D airspace is generally airspace from the surface to 2,500 feet above elevation and Class E airspace is the controlled airspace that is not classified as any of the other airspaces (Class A, B, C, or D).

Other Air Facilities

According to the National Transportation Atlas Database, there are two additional registered air facilities within the Buckeye Municipal Planning Area (MPA): Pierce Airstrip (located near the intersection of Main Street and Rooks Road), and Coyner Airstrip (located near the intersection of Camelback Road and Jackrabbit Trail). Pierce and Coyner are both private airfields limited to agricultural operations.

5.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan is a recently completed comprehensive planning effort to update the General Plan for the City. This General Plan Update has been approved by the Mayor and City Council and was ratified by the citizens of Buckeye in the fall of 2018.

The Imagine Buckeye 2040 General Plan identified numerous recommendations applicable to the maintenance and enhancement of aviation services in the City of Buckeye into the future. These goals, policies and implementation actions are utilized in the development of aviation related recommendations in Section 5.6 of this Chapter. Applicable goals, policies and implementation actions from the recently adopted Imagine Buckeye 2040 General Plan are identified within this section.

Buckeye Municipal Airport Master Plan Update

Long term sustainability and growth of the Buckeye Municipal Airport is important to the City of Buckeye for convenient air travel for residents and visitors to Buckeye and for future economic development opportunities associated with this community asset. The Imagine Buckeye 2040 General Plan established a primary implementation action to update the Buckeye Municipal Airport Master Plan to provide for an updated vision and planned improvements to the airport. The implementation action is as follows:

- Action 46 — Update the Buckeye Municipal Airport Master Plan in close coordination with Luke AFB.

The update the Buckeye Municipal Airport Master Plan is identified within the midterm timeframe of five to ten years. This planned update to the 2007 master plan will define future improvements to the airport, including a funding strategy to complete the planned improvements over time. The master plan update will also address operational aspects of the airport and future compatible uses within the airport boundary. As the update to the Buckeye Municipal Airport will occur in the future, the timing, sequence and specific future improvements to the airport are not available for inclusion into this Transportation Master Plan (TMP). The Imagine Buckeye 2040 General Pan also provides a number of goals and policies that establish the intended improvements to enhance aviation services at the Buckeye Municipal Airport as follows:

- **Goal S-13** The Buckeye Municipal Airport is a key growth center and protected from encroachment.
  - **Policy S-13.1** The City of Buckeye should continue to support the expansion of operations at the Buckeye Municipal Airport in close coordination with Luke AFB.
  - **Policy S-13.2** Proposed land uses and development proposals will be consistent with the 2007 Buckeye Municipal Airport Master Plan.
  - **Policy S-13.3** Multi-modal connections should be provided to the Buckeye Municipal Airport.
  - **Policy S 13.4** The City of Buckeye will improve public awareness of the airport through public outreach and education campaigns.
  - **Policy S-13.5** The City of Buckeye should expand telecommunications at the airport to support state of the art technology, such as wireless internet access and fiber optics.
  - **Policy S-13-6** The City of Buckeye will support work to extend the runway at Buckeye Municipal Airport in close coordination with Luke AFB.

These policies provide broad guidance for the airport master plan update, including improvements to sustain and enhance air services from the Buckeye Municipal Airport into the future.

Buckeye Airport Employment Activity Center

The Imagine Buckeye 2040 General Plan identified the area surrounding the Buckeye Municipal Airport as the Buckeye Airport Employment Activity Center. This activity center is expected to serve as a regional employment and retail hub, anchored by the Buckeye Municipal Airport. Planned future uses are intended to complement and support the business functions of the airport, without limiting the long-term growth potential for the airport.

To guide development of the Buckeye Airport Employment Activity Center, the Imagine Buckeye 2040 General Plan includes an implementation action to complete a specific area plan for the activity center to define land uses, development standards and limitations to ensure no negative impact to operations at the airport. The implementation action is:

- Complete a Specific Area Plan for the Airport Employment Activity Center, as described in the Imagine Buckeye 2040 General Plan.

The Buckeye Airport Employment Activity Center specific area plan is identified within the short timeframe of one to five years.

5.4 Multimodal Integration

The location of the Buckeye Municipal Airport provides significant opportunities for the integration of other modes of transportation including the street network, freight corridors and transit operations. Multimodal connectivity between the airport and other modes of transportation is addressed in the Imagine Buckeye 2040 General Plan with a relevant goal and policy as follows:

- Goal S-9 Buckeye is a connected community with an efficient multi-modal transportation network.
  - Policy S-9.1 The City of Buckeye will require new development to provide connectivity to existing transportation networks to provide accessibility and efficient connections to adjacent parcels, neighborhoods, Activity Centers, and the region.

The Buckeye Municipal Airport is adjacent to a national interstate system, state highway system and a national rail corridor which transport significant passenger traffic and freight through the Phoenix metropolitan area. This passenger traffic and freight provides a significant opportunity for synergy with airport operations and planned expansion of the airport and surrounding area into an employment and retail hub providing jobs and services within the City of Buckeye.

The Buckeye Municipal Airport is located immediately south of I-10, which provides for regional, national, and international access. The airport is located west of SR 85, an important state highway connecting I-10 with Interstate 8 (I-8) which connects southern Arizona and southern California to the west and New Mexico and Texas to the east. This location provides a significant opportunity to integrate the airport with state and interstate travel and commerce. A connected

truck route or freight stop will capitalize on the regional, national and international freight passing through the City of Buckeye every day and support potential future employment and commercial uses with related freight transportation needs.

Truck routes to the airport present opportunities for cargo transport as the airport grows, supporting potential future commercial freight uses that utilize cargo transport. A connected truck route or freight stop supports the distribution of goods and the potential development of distribution centers providing jobs and commerce for the City of Buckeye.

The Union Pacific Railroad (UPRR) line exists in relative proximity to the airport. The location of rail facilities near the airport represent an opportunity for integration with the airport and other modes of transportation in this area. Potential improvements to rail facilities are further identified in Chapter 6, Rail.

At the local level, the Buckeye Municipal Airport is connected to the community through the street network; however, connectivity could be improved by increasing roadway linkages and connecting transit services to the airport for travelers or airport employees. Realignment of Yuma Road and Broadway Road will accommodate the planned expansion of the airport and provide additional opportunities for expanded transit routes.

5.5 Previous Aviation Plans

Buckeye Municipal Airport Master Plan

The Buckeye Municipal Airport Master Plan (Airport Master Plan), adopted in 2007, was created to evaluate the airport's capabilities and to plan for future aviation demand and corresponding airport facilities. In the Airport Master Plan, a series of airside improvements (facilities related to aircraft operations) and landside improvements (facilities that support aircraft services and operations), were proposed, all of which contribute to expanded services at the airport. The following is a summary of the proposed improvements:

Buckeye Municipal Airport Master Plan

Airside Improvements

- Increase airfield capacity
- Upgrade Runway 17-35 to Airport Reference Code C-II design standards
- Extend Runway 17-35 to 8,700 feet
- Provide a precision instrument approach procedure for Runway 17-35
- Install an automated weather observation system (completed)

- Create a holding apron / bypass at each runway end to reduce departure delays (completed)

Landside Improvements

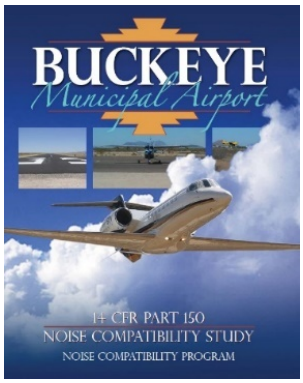
- Create a public terminal building
- Provide areas for the development of facilities associated with aviation businesses that would utilize the airfield (completed)
- Develop small general aviation aircraft storage hangars
- Develop large conventional hangars
- Consider the installation of a helipad
- Maintain a drop zone for existing skydiving activities (completed)
- Relocate fuel tanks for terminal expansion
- Establish a permanent maintenance facility (under design)
- Develop an aircraft wash / maintenance facility
- Establish an airport traffic control tower

In total, 13 of the 75 recommended improvements in the Airport Master Plan have been completed.

The Imagine Buckeye 2040 General Plan establishes an implementation action to update the Airport Master Plan to provide guidance on the future growth and development of the airport. The update to the Airport Master Plan will include a reassessment and reprioritization of the recommendations listed in the 2007 Buckeye Airport Master Plan and will also include new recommendations based on existing and future conditions. Until the Airport Master Plan is updated, the existing Airport Master Plan and its associated recommendations will be used by the City of Buckeye for development guidance.

Buckeye Municipal Airport Noise Compatibility Study

The Buckeye Municipal Airport Noise Compatibility Study (Study) was prepared in 2008 and 2009 for Buckeye Municipal Airport to plan for noise related to airport operations. The Study was conducted in two parts, which are required under federal law (Title 14, Code of Federal Regulations, Part 150 Noise Compatibility Study). The first part, consisting of the Noise Compatibility Study Noise Exposure Maps was released in 2008 and documents the anticipated noise impact five years into the future. The second part, the Noise Compatibility Program, was released in 2009 and provides a noise compatibility plan for noise abatement, land use management, and program management.



Buckeye Municipal Airport Noise Compatibility Study

As part of the Study, noise contours were mapped to show how land uses would be impacted by noise from the airport with the additional proposed runway, as described in the 2007 Airport Master Plan. According to this Study, while no noise-sensitive institutions (i.e. schools, libraries, and places of worship) would be impacted by aircraft noise, there are existing residential land uses as well as potential for additional residential growth around the airport that are impacted by aircraft noise. These Noise Compatibility Study recommendations were considered in the development of this TMP and should be further referenced in future land use planning for the Buckeye Airport Employment Activity Center, defined in the Imagine Buckeye 2040 General Plan, and other properties that could be impacted by the air operations at Buckeye Municipal Airport.

5.6 Aviation Plan Recommendations

This section includes summarized recommendations of the Imagine Buckeye 2040 General Plan as well as the Buckeye Municipal Airport Master Plan. The Buckeye Municipal Airport presents an opportunity for expanded economic development as there is a focus in the Airport Master Plan on extending the current runway. Doing so will add to the capability of the airport to perform operations and expand the types of aircraft that are able to fly into Buckeye Municipal Airport. This economic development opportunity is further expanded in this section including the Imagine Buckeye 2040 General Plan recommendations for an Employment Activity Center at Buckeye Municipal Airport.

Imagine Buckeye 2040 General Plan Recommendations

The Imagine Buckeye 2040 General Plan includes an important recommendation for a future Buckeye Airport Employment Activity Center. Activity Centers are mixed-use centers that offer an environment where residents will be able to actively live, work, and play within the same development area. As such, Activity Centers will include a range of medium- and high-density development (six dwelling units per acre) that promotes walking, bicycling, and transit as viable means of getting from one destination to another.

The Buckeye Airport Employment Activity Center is expected to serve as a regional employment and retail hub, anchored by the Buckeye Municipal Airport. Ensuring future land uses will complement and support the business functions of the airport and not infringe upon the long-term potential of the airport is a significant goal in the planning for the future activity center. Therefore, the Imagine Buckeye 2040 General Plan recommends three key actions:

- Specific Area Plan: Prepare a specific area plan for the Buckeye Airport Employment Center. This specific area plan effort will need to be done in close coordination with Luke AFB and incorporate findings of the Buckeye Municipal Airport Noise Compatibility Study.
- Extend Transit Service: Plan for the extension of transit service to the future Buckeye Airport Employment Center. This recommendation is addressed in Chapter 3, Transit of this TMP.

- **Airport Master Plan Update:** Following the specific area plan, the Buckeye Municipal Airport Master Plan will need to be updated to identify any additional improvements or changes to airport operations.

The Imagine Buckeye 2040 General Plan indicates that the Airport Employment Activity Center is one of the top priorities for short-term implementation by the City. The specific area plan for the Buckeye Airport Employment Activity Center is anticipated to be completed within the first five years following the 2018 Imagine Buckeye 2040 General Plan adoption and voter ratification.

Buckeye Municipal Airport Master Plan Recommendations

The 2007 Buckeye Municipal Airport Master Plan (Airport Master Plan) provides recommendations for airport improvements through an airport capital improvement program (CIP). It is the recommendation of this TMP that the City continue to implement actions identified in the Airport Master Plan until a future update to the Airport Master Plan is completed, following completion of the specific area plan for the Buckeye Airport Employment Activity Center.

Recommendations in the Airport Master Plan are divided into three planning horizons: Short-Term (First Five Years), Intermediate Term (6-10 years), and Long-Term (11-20 years). **Table 5-1** summarizes the total costs for each planning horizon and provides a total cost for all recommendations and eligibility for federal and state funding sources.

Table 5-1: Total Costs by Planning Horizon - Capital Improvement Program for Buckeye Municipal Airport

Total Costs by Planning Horizon	Total Cost	Federally Eligible	ADOT Eligible	Local Share
Short-Term Planning Horizon	$12,038,000	$10,671,350	$280,825	$1,085,825
Intermediate Term Planning Horizon	$27,883,000	$25,468,550	$670,225	$1,744,225
Long-Term Planning Horizon	$52,565,000	$48,916,450	$1,287,275	$2,361,275
Total All Development	**$92,486,000**	**$85,056,350**	**$2,238,325**	**$5,191,325**

Source: Buckeye Municipal Airport Master Plan, 2007.

In total, the Airport Master Plan includes 75 separate projects, 49 of which were to be completed in the first ten years following completion of the Airport Master Plan (2007-2017). In total, 13 projects that have been completed to date, including:

- Land acquisition environment assessment
- Construct taxilane
- Construct airport entrance road
- Design taxiway lighting
- Design interior security fencing and gates
- Design AWOS-III installation
- Install taxiway lighting
- Install interior security fencing and gates
- Install AWOS-III
- Design north and south apron expansion – Phase I
- Extend apron north and south – Phase I
- Prepare pavement maintenance management program
- Pavement maintenance.

A future update of the Airport Master Plan may change the recommended improvements identified in the current Airport Master Plan.

Figure 5-3 illustrates the expanded airport property proposed in the Airport Master Plan and the necessary realignment of Broadway Road and Yuma Road. Additionally, there will be a need to either realign the Roosevelt Irrigation District Canal or pipe or tile the canal to go under the future extended runway. In order to expand the airport, the City must acquire 74 acres to the north of the existing runway, which may be purchased utilizing federal funds.

Figure 5-4 illustrates the development staging of all recommendations identified in the current Airport Master Plan organized by short-, intermediate-, and long-term improvements. The Airport Master Plan lists individual projects by planning horizon, including the total cost per project and the potential cost sharing between the City, federal government, and ADOT. A listing of individual projects by planning horizon are provided on the following pages.

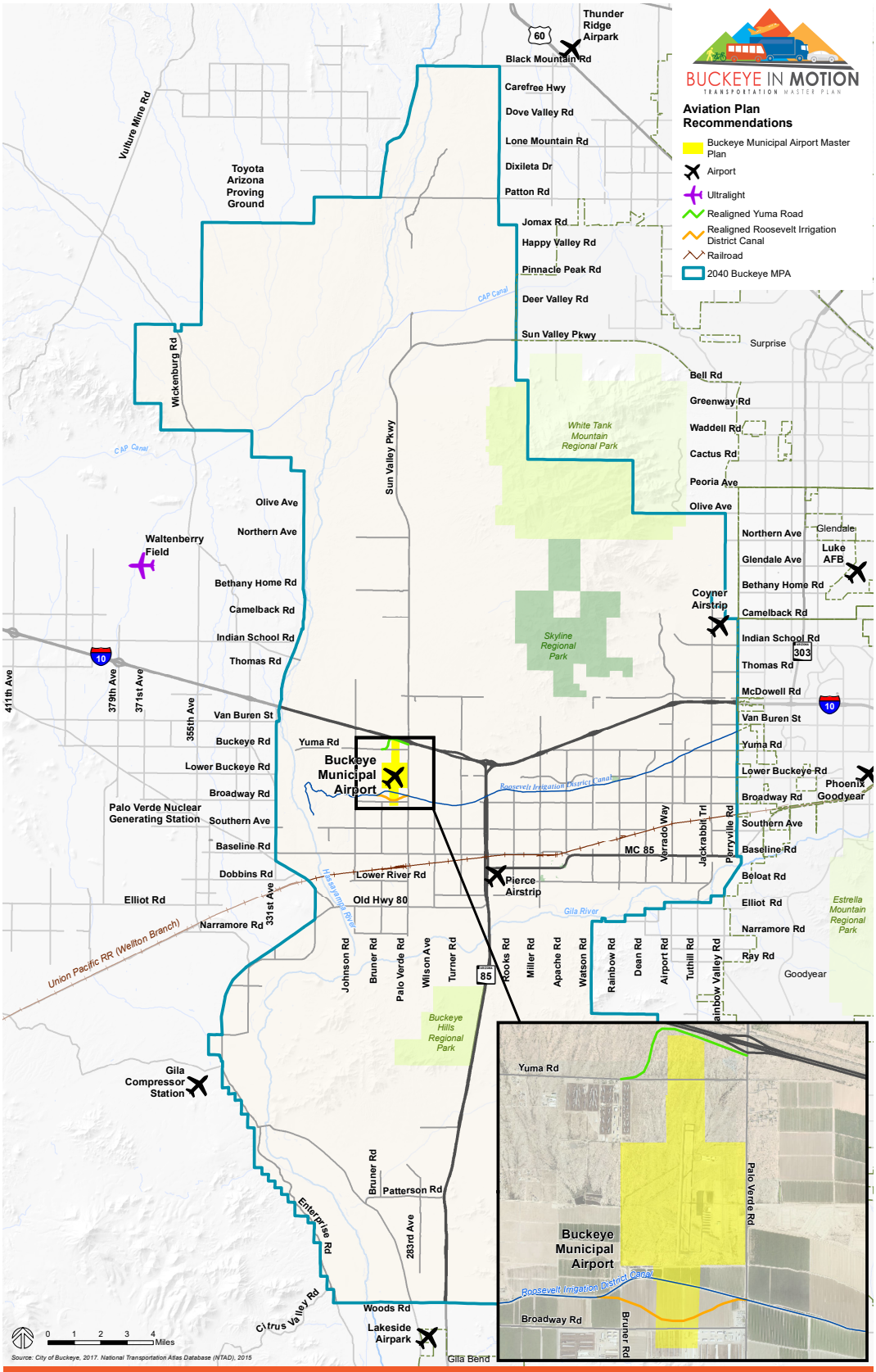


Figure 5-3
Aviation Plan Recommendations

Figure 5-4: Development Staging of Buckeye Municipal Airport Capital Improvement Program

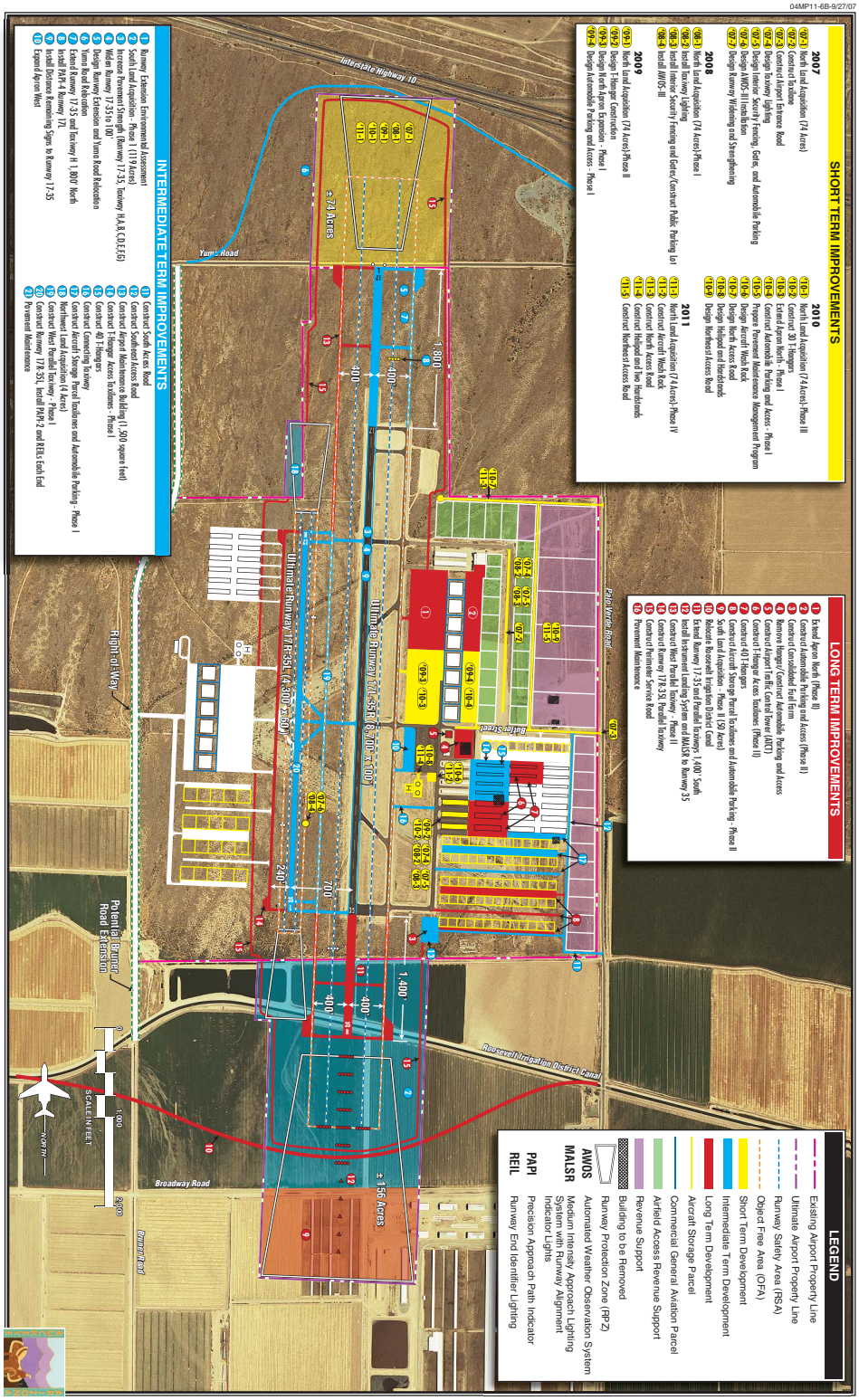


Exhibit 6B
DEVELOPMENT STAGING

Table 5-2 lists the 28 projects, project costs, and eligibility for funding sources within the Short-Term Planning Horizon (First Five Years). In total, 12 projects have been completed from the original Short-Term Planning Horizon project list.

Table 5-2: Short-Term Planning Horizon (First Five Years) - Capital Improvement Program for Buckeye Municipal Airport

Short-Term Planning Horizon (First Five Years)			Total Cost	Federally Eligible	ADOT Eligible	Local Share
2007	1.	Land Acquisition Environmental Assessment (COMPLETE)	$200,000	$190,000	$5,000	$5,000
2007	2.	Construct Taxilane (COMPLETE)	$431,000	$409,450	$10,775	$10,775
2007	3.	Construct Airport Entrance Road (COMPLETE)	$1,000,000	$950,000	$25,000	$25,000
2007	4.	Design Taxiway Lighting (COMPLETE)	$75,000	$71,250	$1,875	$1,875
2007	5.	Design Interior Security Fencing and Gates (COMPLETE)	$32,000	$30,400	$800	$800
2007	6.	Design AWOS-III Installation (COMPLETE)	$38,000	$36,100	$950	$950
2008	1.	North Land Acquisition (74 Acres) -Phase 1	$4,075,000	$3,871,250	$101,875	$101,875
2008	2.	Install Taxiway Lighting (COMPLETE)	$508,400	$482,980	$12,710	$12,710
2008	3.	Install Interior Security Fencing and Gates (COMPLETE)	$210,000	$199,500	$5,250	$5,250
2008	4.	Install AWOS-III (COMPLETE)	$250,000	$237,500	$6,250	$6,250
2009	1.	North Land Acquisition (74 Acres) - Phase II	$4,075,000	$3,871,250	$101,875	$101,875
2009	2.	Design T-Hangar Construction	$75,000	$71,250	$1,875	$1,875
2009	3.	Design North and South Apron Expansion – Phase I and Blast Pads (COMPLETE)	$235,000	$223,250	$5,875	$5,875
2009	4.	Design Automobile Parking and Access - Phase I	$135,000	$128,250	$3,375	$3,375
2010	1.	North Land Acquisition (74 Acres) - Phase III	$4,075,000	$3,871,250	$101,875	$101,875
2010	2.	Construct 30 T-Hangars	$805,000	-	-	$805,000
2010	3.	Extend Apron North and South – Phase I and Blast Pads (COMPLETE)	$3,685,000	$3,500,750	$92,125	$92,125

Source: Buckeye Municipal Airport Master Plan, 2007.

Table 5-2: Short-Term Planning Horizon (First Five Years) - Capital Improvement Program for Buckeye Municipal Airport (continued)

Short-Term Planning Horizon (First Five Years)		Total Cost	Federally Eligible	ADOT Eligible	Local Share
4.	Construct Automobile Parking and Access - Phase I	$627,000	$595,650	$15,675	$15,675
5.	Prepare Pavement Maintenance Management Program (COMPLETE)	$30,000	$28,500	$750	$750
6.	Design Aircraft Wash Rack	$38,000	$36,100	$950	$950
7.	Design North Access Road	$103,000	$97,850	$2,575	$2,575
8.	Design Helipad and Hardstands	$55,000	$52,250	$1,375	$1,375
9.	Design Northeast Access Road	$105,000	$99,750	$2,625	$2,625
1.	North Land Acquisition (74 Acres) - Phase IV	$4,075,000	$3,871,250	$101,875	$101,875
2.	Construct Aircraft Wash Rack	$250,000	$237,500	$6,250	$6,250
3.	Construct North Access Road	$683,000	$648,850	$17,075	$17,075
4.	Construct Helipad and Two Hardstands	$367,000	$348,650	$9,175	$9,175
5.	Construct Northeast Access Road	$855,000	$812,250	$21,375	$21,375
	Subtotal	$27,092,400	$24,973,030	$657,185	$1,462,185

Source: Buckeye Municipal Airport Master Plan, 2007.

Table 5-3 lists the 21 projects, project costs, and eligibility for funding sources within the Intermediate-Term Planning Horizon (6-10 years). In total, one project was completed from the original Intermediate-Term Planning Horizon project list.

Table 5-3: Intermediate-Term Planning Horizon (6-10 Years) - Capital Improvement Program for Buckeye Municipal Airport

Intermediate-Term Planning Horizon (6-10 years)		Total Cost	Federally Eligible	ADOT Eligible	Local Share
1.	Runway Extension Environmental Assessment	$200,000	$190,000	$5,000	$5,000
2.	South Land Acquisition - Phase I (119 Acres)	$6,158,000	$5,850,100	$153,950	$153,950
3.	Increase Pavement Strength (Runway 17-35, Taxiway H, A, B, C, D, E, F, G)	$680,000	$931,000	$24,500	$24,500
4.	Widen Runway 17-35 to 100'	$1,120,000	$1,064,000	$28,000	$28,000
5.	Design Runway Extension and Yuma Road Relocation	$430,000	$408,500	$10,750	$10,750
6.	Yuma Road Relocation	$1,614,000	$1,533,300	$40,350	$40,350
7.	Extend Runway 17-35 and Taxiway H 1,800' North	$4,133,000	$3,926,350	$103,325	$103,325
8.	Install PAPI-4 Runway 17L	$65,000	$6,1750	$1,625	$1,625
9.	Install Distance Remaining Signs to Runway 17-35	$200,000	$190,000	$5,000	$5,000
10.	Expand Apron West	$835,000	$793,250	$20,875	$20,875
11.	Construct South Access Road	$832,000	$790,400	$20,800	$20,875
12.	Construct Southeast Access Road	$825,000	$783,750	$20,625	$20,625
13.	Construct Airport Maintenance Building (1,500 square feet)	$150,000	$142,500	$3,750	$3,750
14.	Construct T-Hangar Access Taxilanes - Phase I	$598,000	$568,100	$14,950	$14,950
15.	Construct 40 T-Hangars	$1,074,000	-	-	$1,074,000
16.	Construct Connecting Taxiway	$209,000	$198,550	$5,225	$5,225
17.	Construct Aircraft Storage Parcel Taxilanes and Automobile Parking – Phase I	$720,000	$684,000	$18,000	$18,000
18.	Northwest Land Acquisition (4 Acres)	$190,000	$180,500	$4,750	$4,750
19.	Construct West Parallel Taxiway - Phase I	$2,710,000	$2,574,500	$67,750	$67,750
20.	Construct Runway 17R-35L, Install PAPI-2 and REILs Each End	$4,840,000	$4,598,000	$121,000	$121,000
21.	Pavement Maintenance (COMPLETE)	$2,500,000	$2,375,000	$62,500	$62,500
	Subtotal	$30,383,000	$27,873,550	$732,725	$1,806,725

Source: Buckeye Municipal Airport Master Plan, 2007.

Table 5-4 lists the 16 projects, project costs, and eligibility for funding sources within the Long-Term Planning Horizon (11-20 years). No projects have been completed from the original Long-Term Planning Horizon project list.

Table 5-4: Long-Term Planning Horizon (11-20 Years) - Capital Improvement Program for Buckeye Municipal Airport

Long-Term Planning Horizon (11-20 years)		Total Cost	Federally Eligible	ADOT Eligible	Local Share
1.	Extend Apron North (Phase II)	$3,920,000	$3,724,000	$98,000	$98,000
2.	Construct Automobile Parking and Access (Phase II)	$960,000	$912,000	$24,000	$24,000
3.	Construct Consolidated Fuel Farm	$500,000	$475,000	$12,500	$12,500
4.	Remove Hangar/Construct Automobile Parking and Access	$375,000	$356,250	$9,375	$9,375
5.	Construct Airport Traffic Control Tower (ATCT)	$3,000,000	$2,850,000	$75,000	$75,000
6.	Construct T-Hangar Access Taxilanes (Phase II)	$702,000	$666,900	$17,550	$17,550
7.	Construct 40 T-Hangars	$1,074,000	$0	$0	$1,074,000
8.	Construct Aircraft Storage Parcel Taxilanes and Automobile Parking – Phase II	$554,000	$526,300	$13,850	$13,850
9.	South Land Acquisition - Phase II (50 Acres)	$10,000,000	$9,500,000	$250,000	$250,000
10.	Relocate Roosevelt Irrigation District Canal	$12,560,000	$11,932,000	$314,000	$314,000
11.	Extend Runway 17-35 and Parallel Taxiways 1,400' South	$4,140,000	$3,933,000	$103,500	$103,500
12.	Install Instrument Landing System and MALSR to Runway 35	$3,000,000	$2,850,000	$75,000	$75,000
13.	Construct West Parallel Taxiway - Phase II	$1,920,000	$1,824,000	$48,000	$48,000
14.	Construct Runway 17R-35L Parallel Taxiway	$2,860,000	$2,717,000	$71,500	$71,500
15.	Construct Perimeter Service Road	$2,000,000	$1,900,000	$50,000	$50,000
16.	Pavement Maintenance	$5,000,000	$4,750,000	$125,000	$125,000
	Subtotal	$52,565,000	$48,916,450	$1,287,275	$2,361,275

Source: Buckeye Municipal Airport Master Plan, 2007.

The recommendations provided in the Airport Master Plan provide a listing of projects to be constructed within the identified timeframes. By 2018, 49 of the 75 identified projects were to be completed; however, to date just 13 projects have been completed. In the future update to the Airport Master Plan this project list will be revisited and likely revised to address evolving needs of the airport operations. These evolving needs will address changes in technology, changes in services and customer types, and the changes associated with becoming an employment activity center.

Buckeye Municipal Airport Drainage and Utilities Study Recommendations

The Buckeye Municipal Airport Drainage and Utilities Study was created in 2008 by an engineering firm to create recommendations to the City of Buckeye for increasing drainage and utility capacity and services that would support growth of the airport. Recommendations were made for the following:

- **Water system** – Water system recommendations include the design and construction for proposed domestic water system and fire protection system infrastructure. This is estimated to cost $6.5 million.
- **Sewer system** – It is recommended that a complete sanitary wastewater sewer system infrastructure be designed and constructed in three independent sewer improvement sections. The cost estimated for these recommendations is $2.8 million.
- **Electrical** – Recommendations for electrical include the utilization of primary power on Palo Verde Road as underground service. It is also recommended that the existing overhead secondary power on the airport be converted to buried duct banks and converting 1,000 feet of existing power poles along Yuma Road to buried service.
- **Communications** – Communications recommendations include shared trench electrical and telephone services on property and cable service followed by conduit for voice and data transmission infrastructure. The cost associated with these recommendations is $1.9 million.
- **Natural Gas System** – While Southwest Gas has indicated that it is unlikely that natural gas facilities will be available on Palo Verde Road, the City of Buckeye has identified possible infrastructure that could service facilities at the airport. If such infrastructure was constructed, the cost is estimated at $700,000.
- **Utility Corridors** – Utility corridors are recommended to be identified for future water, sewer, electric, ITS, telecommunications, and gas utilities. Drainage is not to be placed in such corridors. There is no specified cost detailed for these improvements.
- **Drainage** –Drainage improvement recommendations include six tributary drainage sub-areas with drainage features that are grouped into four systems: off-site drainage system, on-site infield retention system, on-site storm drain system, and on-site graded system with swales. The estimated cost for these improvements is $4.2 million.

These recommendations should be further evaluated and considered in the update to the Buckeye Municipal Airport Master Plan. Additionally, a sustainable funding source should be identified for these needed investments at Buckeye Municipal Airport and the long-term maintenance of such infrastructure.

5.7 Aviation Implementation and Funding

This section provides an overview of the implementation strategies for the Buckeye Municipal Airport and the available sources of funding to implement the Aviation Plan recommendations.

Funding

Currently the City of Buckeye receives entitlement funding of $150,000 annually for the Airport Capital Improvement Program via the Federal Aviation Administration (FAA) and/or ADOT. The City has saved past entitlement funds for the design of taxiway and apron improvements. The FAA and/or ADOT funds capital projects for the airport, focusing on projects related to the runway, taxiway, and other flight safety specific projects. Operations at the airport, such as maintaining infrastructure operations and upgrading facilities, are being supported by airport revenues.

Specific improvements needed are identified by the City of Buckeye, consistent with the approved Airport Master Plan. The City of Buckeye prioritizes the needs, submit grant requests, and provide the required local matching funds. All FAA grant monies awarded go directly from the FAA to the City of Buckeye; they do not pass through MAG or ADOT.

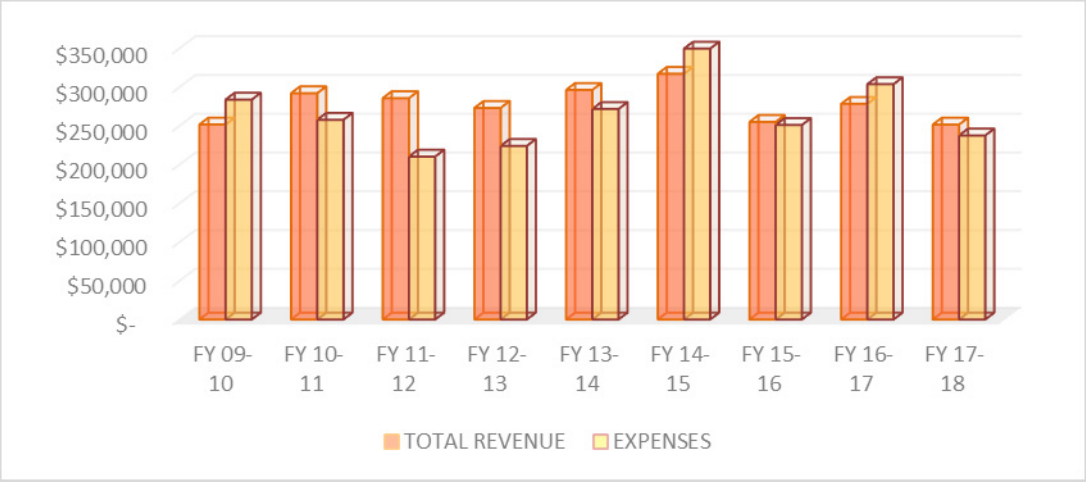
As seen in Table 5-5 and shown on Figure 5-5, much of the airport revenue goes towards operations, making it important to continue investment into the airport to increase airport related businesses and additional airport operations, thus expanding upon runway expansion requirements, which can increase FAA funding. It is the recommendation of this TMP that the City investigate a sustainable local funding source to provide the necessary match for airport capital investments and any investments deemed non-eligible for entitlement funding.

Table 5-5: Buckeye Municipal Airport Revenue and Expenses from 2010-2018

	Fuel Sales	Ground Rental	Airport Hangar	Revenue	Carryover	Total Revenue	Expenses	%Over or Under
FY 09-10	$130,686	$9,818	$89,664	$230,168	$21,399	$251,567	$283,668	-13%
FY 10-11	$131,331	$55,000	$88,555	$274,886	$17,077	$291,962	$257,664	6%
FY 11-12	$131,665	$55,000	$95,017	$281,682	$3,864	$285,546	$210,132	25%
FY 12-13	$94,076	$89,718	$100,581	$284,375	$11,406	$272,969	$223,908	21%
FY 13-14	$110,392	$82,363	$101,737	$294,492	$1,667	$296,159	$271,571	8%
FY 14-15	$40,053	$41,805	$109,151	$291,009	$25,979	$316,987	$349,492	-20%
FY 15-16	$132,836	$425	$109,369	$242,630	$12,265	$254,895	$250,919	-3%
FY 16-17	$146,031	$250	$117,309	$263,590	$14,562	$278,152	$303,594	-15%
FY 17-18	$143,856	$500	$104,589	$248,945	$2,524	$251,469	$237,372	5%

Source: City of Buckeye, 2018.

Figure 5-5: Buckeye Municipal Airport Total Revenue v. Expenses



Source: City of Buckeye, 2018.

The Buckeye Municipal Airport Master Plan provides short-term (first five years), intermediate-term (6-10 years), and long-term (11-20 years) planning horizons for the implementation of improvements. The cost for improvements may be funded by the City; however, state and federal funding sources are available with the potential to cover some of the cost.

The **Airport and Airway Trust Fund (Trust Fund)** is a federal fund, provided by taxes on airline ticket sales, aviation fuel, air cargo, and the flight segment tax. Funds from the Trust are distributed annually by the FAA from appropriations by Congress and may cover both capital and operating costs. Airport improvements can also be implemented through the **Airport Improvement Program (AIP)**, which is a funding mechanism for public agencies to receive funding for public-use airports. Eligible airports must be a part of the National Plan of Integrated Airport Systems (NPIAS), which identifies existing and proposed airports that are eligible for AIP grants due to their significance to national air transportation. As of 2017, Buckeye Municipal Airport is listed as an NPIAS airport.

At the state level, funds for airports are sourced through the **State Aviation Fund**. Distribution of these funds is allocated through the **Airport Capital Improvement Program**, developed by ADOT, which maximizes the use of both state and FAA funds. State Aviation Funds are derived from flight property tax, aircraft lieu taxes, and aviation fuel taxes and distributed between design / construction projects, planning projects, and land acquisition. The State Transportation Board approves the distribution of these funds annually. Through the State Aviation Fund, the State can match federal grants and provide state-funded grants for qualifying airport projects. ADOT also has an **Airport Loan Program**, which provides funding for airport improvements to eligible airports. Such loans are provided to improve the economic status of the airport.

In addition to traditional funding sources, the City should investigate additional public-private partnership arrangements. Public-private partnerships refers to arrangements between the public and private sectors whereby some of the services that would typically be a public-sector responsibility are provided by the private-sector, with agreement on objectives for delivery of public infrastructure or public services. Several privatization models exist that may be examined further through the update to the Airport Master Plan, including:

- Service contracts
- Management contracts
- Developer financing / operation
- Full privatization (long-term lease or sale)

Implementation

This Aviation chapter identifies four improvement types: implement recommendations of the Buckeye Municipal Airport Master Plan, prepare a specific area plan, extend transit service to Buckeye Municipal Airport, and update the existing Airport Master Plan.

Table 5-6 provides a listing of the Short-term Aviation Recommendations. Table 5-7 provides a listing of the Mid-term Aviation Recommendations. Table 5-8 provides a listing of the Long-term Aviation Recommendations. The planning-level costs and other implementation actions associated with these improvements are included in Chapter 9, Recommendations and Implementation.

Table 5-6: Short-term Aviation System Recommendations

Project Name	Description	Sources
Airport Operations	Continue to operate the Buckeye Municipal Airport focusing on safety of aviation operations.	TMP, AMP
Funding Sources	Assess available funding sources for aviation and determine if a dedicated local funding source is needed now or in the future to make sustainable investments in Buckeye Municipal Airport. Investigate opportunities associated with public-private partnership agreements.	TMP
Specific Area Plan	Complete a Specific Area Plan for the Airport Employment Activity Center, as described in the Imagine Buckeye 2040 General Plan.	GP
Airport Master Plan Short-Term Recommendations	Continue to implement the short-term recommendations identified in the 2007 Airport Master Plan.	AMP
Purchase Land	Complete the purchase of the 74 acres located north of the existing runway to allow for an expansion of the current runway.	AMP, TMP

Source: Matrix Design Group, 2018; Imagine Buckeye 2040 General Plan, 2018; Buckeye Municipal Airport Master Plan, 2007.

Table 5-7: Mid-term Aviation System Recommendations

Project Name	Description	Sources
Drainage and Utility Study	Implement recommendations of the Buckeye Municipal Airport Drainage and Utility Study	TMP
Airport Master Plan Update and Implementation	Following completion of the Specific Area Plan, conduct an update of the Airport Master Plan including assessing previously recommended improvements, available funding sources, and additional goals for the airport and surrounding development areas. Begin implementing recommendations of the updated Airport Master Plan.	GP
Transit Feasibility Study	Assess the feasibility of transit service to the Buckeye Municipal Airport and implement recommendations from the study. This recommendation is incorporated in Chapter 3, Transit.	TMP, GP

Source: Matrix Design Group, 2018; Imagine Buckeye 2040 General Plan, 2018; Buckeye Drainage and Utility Study, 2008.

Table 5-8: Long-term Aviation System Recommendations

Project Name	Description	Sources
High Capacity Transit Studies	Conduct corridor study to determine implementation of high capacity transit service to Buckeye Municipal Airport. This recommendation is incorporated in Chapter 3, Transit.	TMP
Airport Master Plan Implementation	Continue to implement recommendations identified in the updated Airport Master Plan.	TMP

Source: Matrix Design Group, 2018; Buckeye Municipal Airport Master Plan, 2007.

5.8 Summary

The City of Buckeye acknowledges the importance of the Buckeye Municipal Airport and the integral role the airport plays in the transportation network. The airport is considered one of the top economic development priorities for the City. In fact, the Imagine Buckeye 2040 General Plan identifies the airport as a future Airport Employment Activity Center that will include a mix of medium- and high-density developments that encourage people to live, work and play all within the same activity center. The future Buckeye Municipal Airport will be surrounded by mixed-use development that do not impede airport operations and meets compatible land use requirements. The mixed-use development will be supported by multimodal transportation options, allowing people to choose to either drive, walk, bike, or ride transit to reach their destination.

To meet this vision, the Buckeye Municipal Airport runway must be upgraded and extended, which requires realignment of Yuma Road and Broadway Road. The City should revaluate if rerouting the Roosevelt Irrigation District Canal or piping/tiling the canal under the future extended runway would be the best option. However, the City must recognize and fund the much-needed utility infrastructure improvements needed, otherwise, the airport will be stagnant in its growth potential, as has been evidenced in the past several decades. Additionally, the Buckeye Municipal Airport Master Plan identifies airside and landside improvements that will raise the caliber of operation and attract additional customers with these additional amenities.

Lastly, the goal and vision for the airport and the surrounding development areas have changed since the completed of the Airport Master Plan in 2007. As such, an Airport Master Plan update should be conducted to address any changes in technology, changes in airport operations, and changes in the long-range goal of creating a future employment activity center surrounding the airport.

Recommendations of this Aviation Plan are incorporated in Chapter 9 (Recommendations and Implementation) of this TMP along with the recommendations of other TMP Plan Elements (streets, transit, active transportation, rail, freight, and ITS).

Please see the next page.

6.1 Introduction

The Imagine Buckeye 2040 General Plan establishes economic development goals, which include diversifying the economy by expanding upon various industries such as manufacturing, agriculture technology, and retail that heavily rely on the movement of goods and materials by rail. Rail supports expansion and diversification of the local economy by providing connections to regional, national, and international markets. Additionally, opportunities associated with diversifying use of the existing rail corridor includes the potential additional of commuter rail service to meet the demands of a growing commuter population. Included in the Rail Chapter are eight sections:

- Section 6.1 **Introduction.** Rail chapter purpose and contents.
- Section 6.2 **Existing Rail Facilities.** Existing rail infrastructure in Buckeye.
- Section 6.3 **Imagine Buckeye 2040 General Plan.** Relevant goals and policies from the Imagine Buckeye 2040 General Plan that support rail and associated land uses that are compatible with the use of rail.
- Section 6.4 **Multimodal Integration.** An overview of how rail is related to other modes of transportation within the Buckeye transportation network.
- Section 6.5 **Relevant Rail Plans.** Relevant previous rail plans and studies.

- Section 6.6 **Rail Recommendations.** Recommendations from previous rail plans.
- Section 6.7 **Rail Implementation and Funding.** Implementation plan and potential funding sources for recommendations.
- Section 6.8 **Summary.** Summary of the Rail Chapter.

6.2 Existing Rail Facilities

Understanding the existing rail and freight facilities within the Buckeye planning area is a necessary step before planning for future rail services. This section includes an overview of the rail facilities that currently exist in Buckeye, which are shown in **Figure 6-1**.

The Union Pacific Railroad (UPRR) is an interstate railroad that traverses through the Buckeye Municipal Planning Area (MPA). The UPRR rail line extents into 23 states in the West and Midwest. In Buckeye, the rail line runs in an east-west direction generally along the Baseline Road alignment. This rail line ultimately provides connection to California and New Mexico.

The UPRR rail line includes the Wellton Branch Line, which is currently in service within the Buckeye MPA. Although the Wellton Branch rail line is in service within the Buckeye MPA, an 80-mile segment of the Wellton Branch rail line, west of the Buckeye MPA, is currently out of service. This out of service segment requires trains to detour 130 miles to reach California. Various reports have studied the possibility of re-establishing this branch line, which is detailed further in the Relevant Rail Plans section.

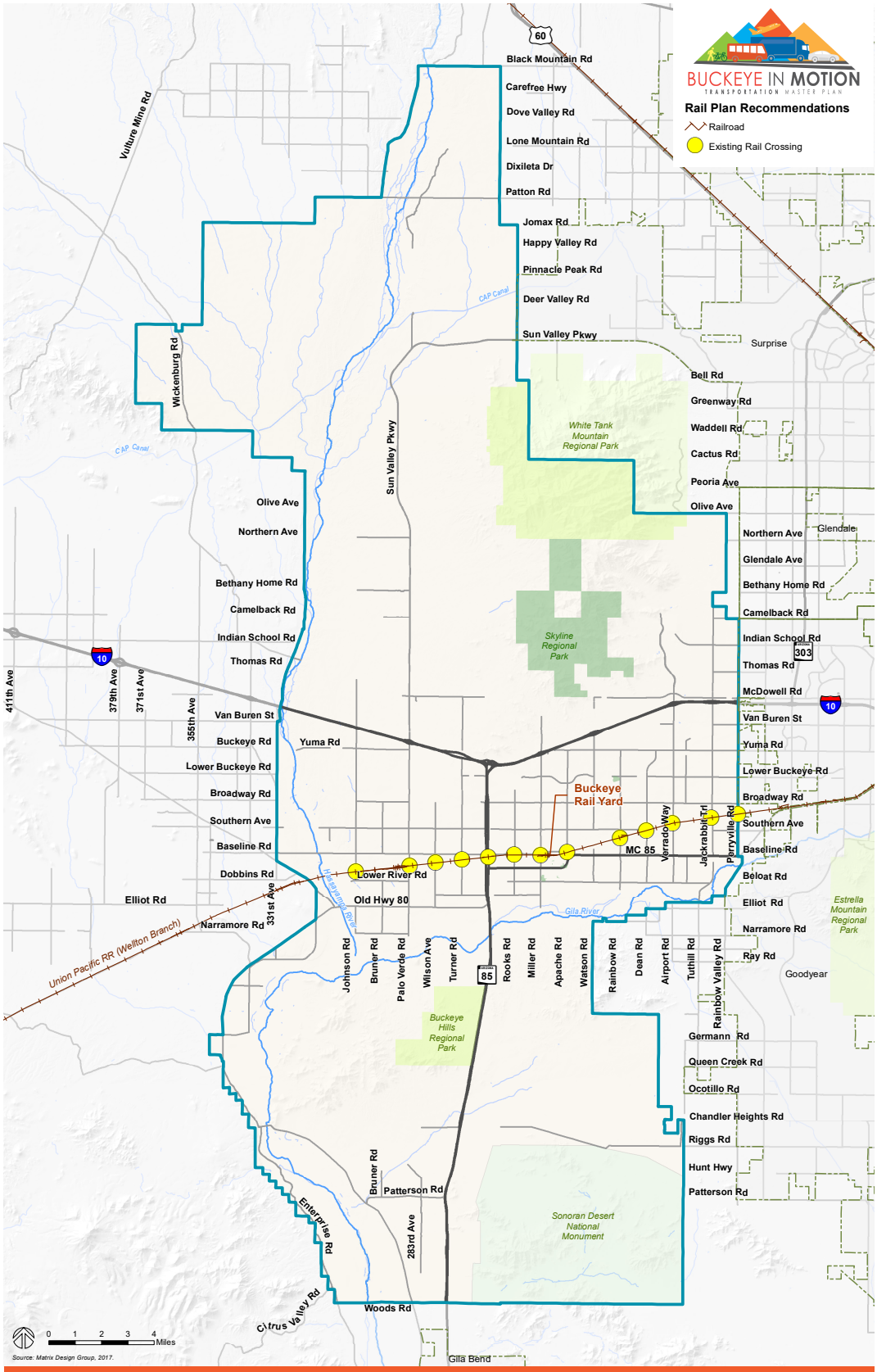
Several rail facilities are located along the UPRR including the Buckeye Yard, and 14 existing at-grade rail crossings. The following is a description of these rail facilities:

- **Buckeye Yard** includes a former depot site, which has been identified in several studies as a potential commuter rail station. The Buckeye Yard is located east of the intersection of Baseline Road and Miller Road. The yard is located on the north side of the tracks; however, the customers the yard serves are located on the south side of the tracks.

- **At-grade Rail Crossings** exist at 16 locations in the Buckeye MPA including:
  - 4th Street
  - Apache Road
  - Baseline Road and
  - Dean Road
  - Jackrabbit Trail
  - Johnson Road
  - Miller Road
  - Palo Verde Road
  - Perryville Road
  - Rainbow Road
  - Rooks Road
  - SR 85 North
  - SR 85 South
  - Turner Road
  - Verrado Way
  - Wilson Avenue

At-grade crossing, Wellton Branch rail line at Palo Verde Road

The existing rail lines and facilities were considered during the development of the recommendations for this Chapter.



Matrix DESIGN GROUP

Figure 6-1
Existing Rail Facilities

6.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan identified recommendations relevant to the support of rail in Buckeye. The goals and policies are used for the development of the rail recommendations in this Chapter. These policies focus on promoting employment and industrial uses in appropriate areas, maintaining compatibility between rail operations and neighboring land uses, and expanded regional rail connectivity.

Promoting Employment, Industrial, and Compatible Land Uses

Land uses that are most compatible with rail are those that are dependent upon, or benefit from, having access to the distribution of goods. Such examples of these land uses are employment and agricultural uses. While there are land uses that would benefit from rail, there are some that would not due to noise sensitivity, vibration, traffic, and other impacts that rail may have. Land uses that are incompatible with rail in Buckeye are residential uses, dense commercial areas, and open spaces that promote active recreation. These land uses are generally more sensitive to the impacts of rail or would not necessarily benefit from having rail nearby and should be considered when planning for rail.

The Imagine Buckeye 2040 General Plan defines the Employment land use, which may include industrial uses, such as manufacturing and warehouse facilities, both of which would benefit from having rail as a distribution option proximate to their location. Additionally, agricultural uses are dependent upon the distribution of goods that are grown or produced, making such uses compatible with rail terminals. Linking rail with these land uses will support the economic growth of industries within Buckeye.

The Imagine Buckeye 2040 General Plan identified the following rail-related goals and policies that support compatible land uses.

- Goal G-7 Buckeye has a strong employment base providing a range of jobs opportunities with competitive salaries.
  - Policy G-7.2 The City of Buckeye will encourage the use of the land adjacent to existing rail corridors for light and general industrial employment uses.
  - Policy G-7.3. The City of Buckeye should protect existing industrial development from encroachment by incompatible development.

- **Goal G-9** Buckeye has an expansive and diverse economy.
  - **Policy G-9.3** The City of Buckeye should protect its primary industrial and commercial corridors (areas with access to highways and railroads) from conversion to non-employment uses or encroachment by uses that would limit future uses on these sites.

Expanded Regional Rail Connectivity

Do to the expansiveness of the UPRR, the rail line in Buckeye provides regional, and even national, connectivity. Supporting the existing rail lines and encouraging new uses, such as commuter rail, on the lines, will expand the City's ability to transport goods and serve commuters throughout the region. The following goals and policies support rail expansions:

- **Goal S-9** Buckeye is a connected community with an efficient multimodal transportation network.
  - **Policy S-9.8** The City of Buckeye will actively promote and lobby for the expansion and development of new key transportation facilities, including commuter rail and other regional transportation opportunities.
- **Goal S-12** Buckeye's multimodal system provides alternatives for modes of travel.
  - **Policy S-12.3** The City of Buckeye should explore options for adding high capacity transit, such as commuter rail.
  - **Policy S-12.9** The City of Buckeye will support work to reopen the UPRR Wellton Branch.

These goals and policies underscore support for a rail system that influences industry growth and regional transportation opportunities. Provided in this Rail Chapter are transportation recommendations that support these policies, including both freight and commuter rail.

6.4 Multimodal Integration

The future multimodal transportation network in Buckeye will support connectivity and economic development throughout the city. Rail is one component of the overall network but is an important link in the chain in Buckeye's transportation network. More than any other mode of transportation, rail can provide the mass movement of goods and expands the markets the City is able to reach. Rail terminals in Buckeye should be connected by truck routes to move goods throughout the city. Additionally, while the UPRR rail does not directly run to the Buckeye Municipal Airport, truck routes could connect the rail line to the airport, creating additional opportunities for cargo transport.

In Buckeye, the UPRR rail line intersects with SR 85 and will intersect with the future I-11 corridor. The intersections of these two types of modes of transportation creates an opportunity for the

development of industry hubs for the city and the region. Additionally, the intersection with the future I-11 corridor may require the need for crossings that would not disrupt the flow of traffic on the roadways.

The potential future commuter rail stations would be well integrated with bus stops, allowing regional travelers to reach their destination in Buckeye via city-wide transit. Neighboring transit hubs and commuter rail stops would support an efficient integration of transportation networks.

6.5 Relevant Rail Plans

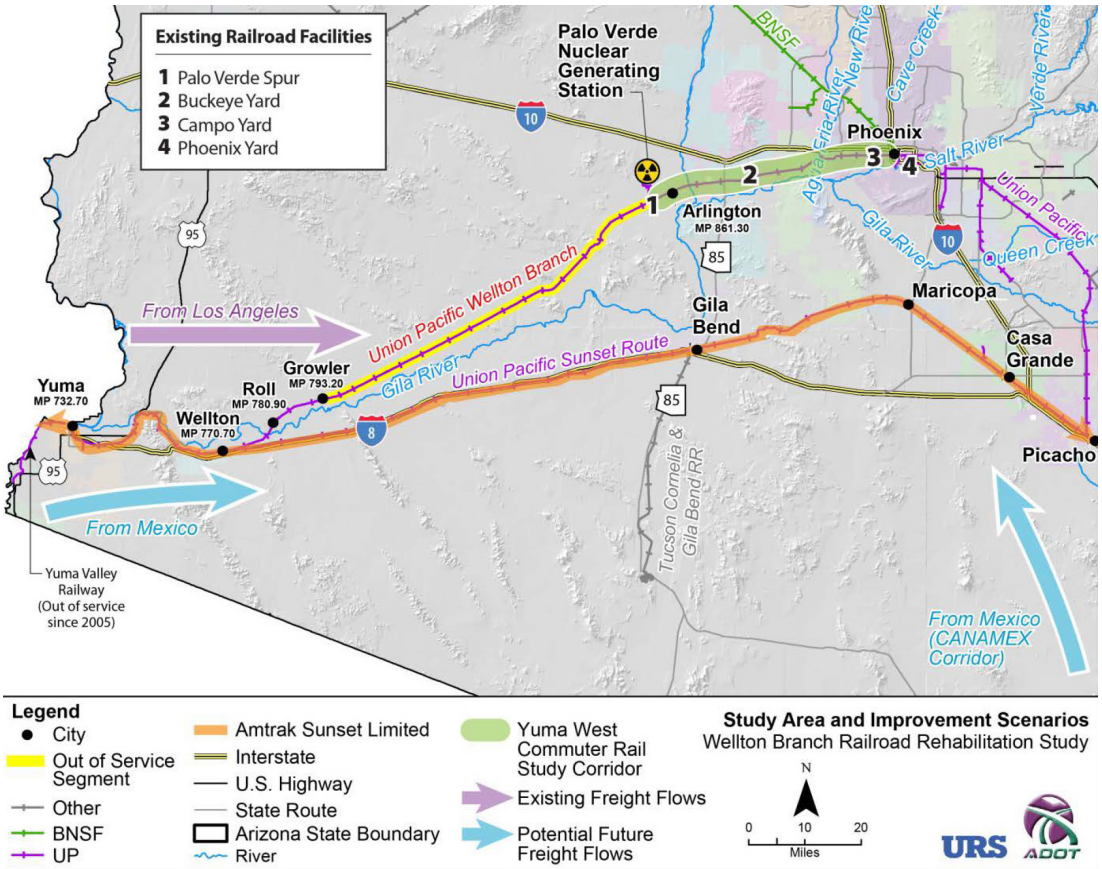
The Maricopa Association of Governments (MAG) has conducted several studies related to rail and freight mobility for the region. The railroad improvements proposed in the studies present opportunities for economic growth in Buckeye. Rail transportation can serve as a catalyst for economic development in the City by supporting the import of materials and the distribution of goods. Additionally, Buckeye, MAG, and MAG's member jurisdictions have planned for the future use of the UPRR line for passenger (commuter) rail service. Therefore, the UPRR line would be used for the movement of both goods and people. Passenger rail services would enhance the connectivity of the region and expand the multimodal transportation network.

Wellton Branch Railroad Rehabilitation Study

In 2014, MAG released the Wellton Branch Railroad Rehabilitation Study (Study), to present alternatives for rehabilitation of the 80-mile out of service segment of the railroad line. The Study presented four different alternatives with various levels of rehabilitation or new infrastructure to provide for freight and passenger rail services with costs ranging from $165 million to $420 million. The Study concluded with the recommendation that the cost of improvements was not justified with passenger rail use exclusively and that additional freight generating land uses are needed along the rail corridor. The Study recommends that agencies continue to identify and develop freight opportunities to increase freight demand for the corridor. As freight opportunities increase, the infrastructure investment becomes more warranted and will support the necessary improvements to the disconnected service line that exists today.

Figure 6-2 shows the study area for the Wellton Branch Railroad Rehabilitation Study.

Figure 6-2: Wellton Branch Railroad Rehabilitation Study – Study Area



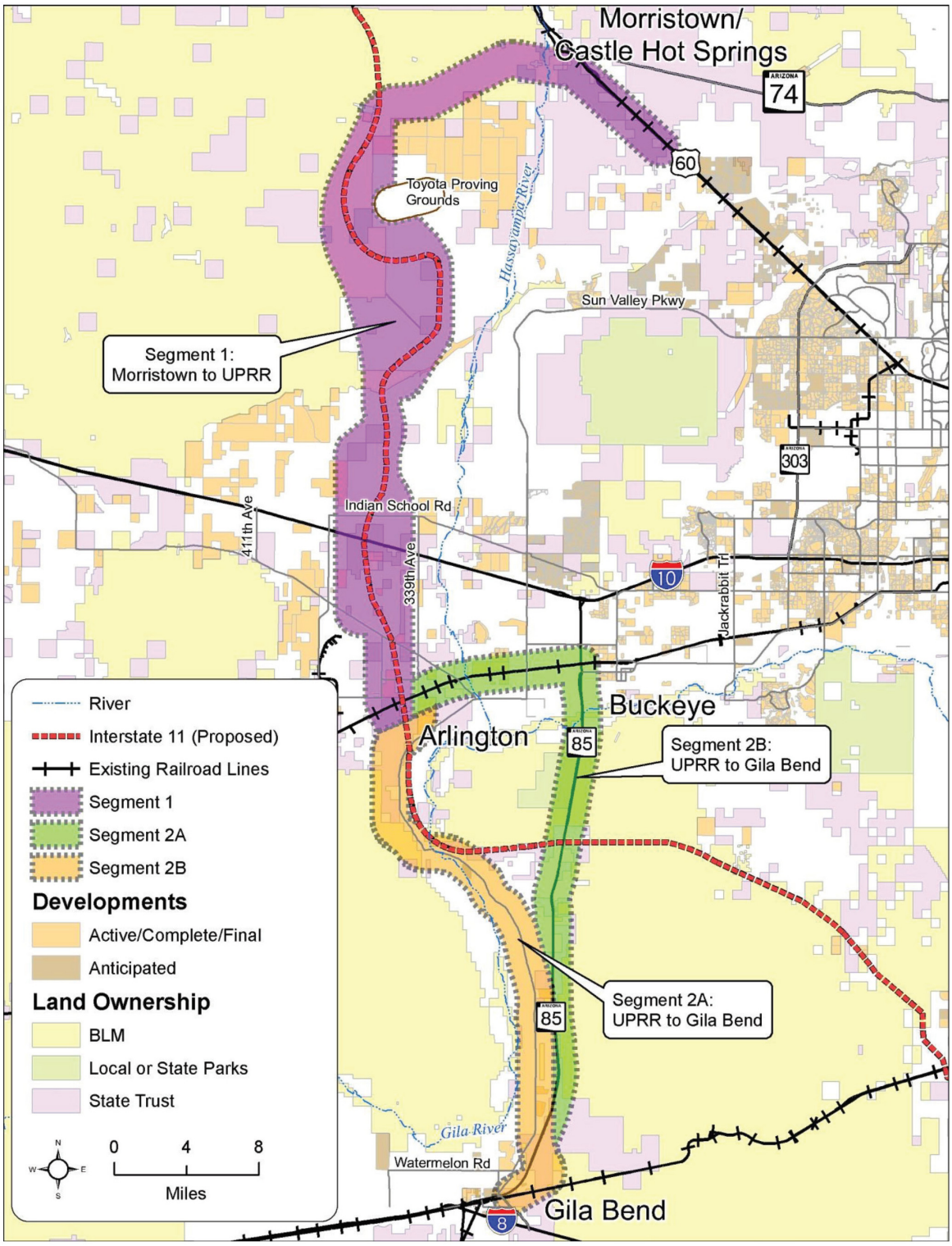
Source: MAG, Wellton Branch Railroad Rehabilitation Study, 2014.

Hassayampa Valley Rail Corridors Cost Analysis Update

In 2013 MAG produced the Hassayampa Valley Rail Corridors Analysis Update (Analysis Update), which analyzed the north-south rail corridors in the southwest Phoenix metropolitan area; however, the study has not garnered regional support for interagency cooperation and funding. Nevertheless, the study was evaluated for the purpose of this TMP and was ultimately not included in the Rail recommendations.

The potential rail corridors evaluated in the Analysis Update are shown on **Figure 6-3**. Segment 1 would connect the UPRR Sunset line, south of I-10 and the Burlington Northern Santa Fe (BNSF) line, along US 60. If completed, this would connect the two Class I railroads in Arizona and serve as a detour to the portion of Wellton Branch rail line that is out of service. Another potential connection evaluated in the Analysis Update would connect the UPPR line with the line located in the Town of Gila Bend. There are two potential connections for this – one would connect to the Gila Bend line through Buckeye and the other would connect to Gila Bend through Arlington. Both potential connections are shown as Segment 2A and Segment 2B on **Figure 6-3** and will be assessed in the future as need arises.

Figure 6-3: Hassayampa Valley Rail Corridor Segment Alternatives



Source: MAG, Hassayampa Valley Rail Corridors Cost Analysis Update, 2013.

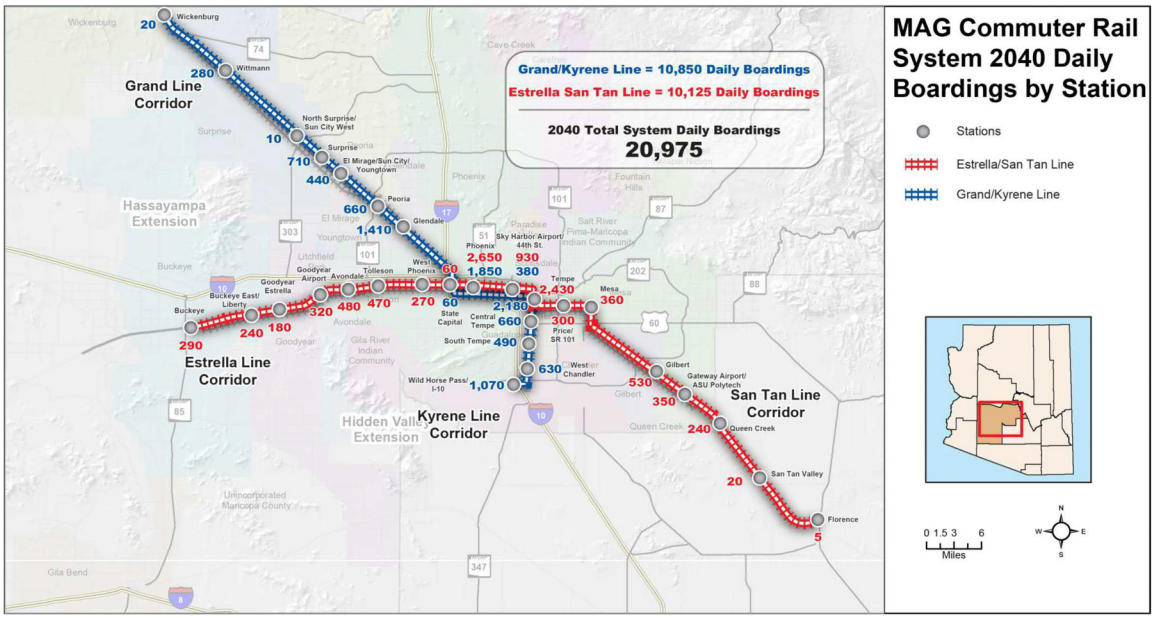
Commuter Rail System Study

MAG updated the 2010 MAG Commuter Rail System Study (Commuter Study) in the fall of 2018. The 2010 Commuter Study evaluated the need and feasibility of commuter rail including corridor alternatives in both the East and West Valley of the Phoenix metropolitan area. The update to this plan revises the results of the original study, further analyzing commuter rail corridors that were initially evaluate din 2010. One of the proposed corridors in the West Valley is the Estrella Line, previously the Yuma West in the 2010 plan, which extends west from Phoenix to Buckeye. This 45-mile corridor would be implemented on the existing UPRR line and would include a station/stop near Historic Downtown Buckeye. Other corridors recommended in the 2018 Commuter Study evaluated include: Grand Line (connecting downtown Phoenix to Surprise), the Kyrene Line (connecting downtown Phoenix, Tempe, and Chandler), the San Tan line (connecting downtown Phoenix, Tempe, Mesa, Gilbert, and Queen Creek), and the Chandler Corridor.

According to the Commuter Study, the Estrella Line is proposed to connect from Buckeye to Phoenix. The extension into Buckeye is proposed as a near-term corridor extension. Figure 6-4 illustrates the estimated daily boardings in 2040 from the 2018 Study Update.

In 2010 MAG completed the Yuma West Commuter Rail Corridor Development Plan which included analysis of existing and future conditions, a conceptual corridor development plan, estimated costs, and implementation strategies. This study recommended implementation of the segment connecting to Buckeye between year 2030 and 2040 with 30-minute headways in the peak AM and PM hours and 60-minute headways in the off-peak hours.

Figure 6-4: MAG Commuter Rail System 2040 Daily Boardings By Station



Source: MAG, Commuter Rail System Study Update, 2018.

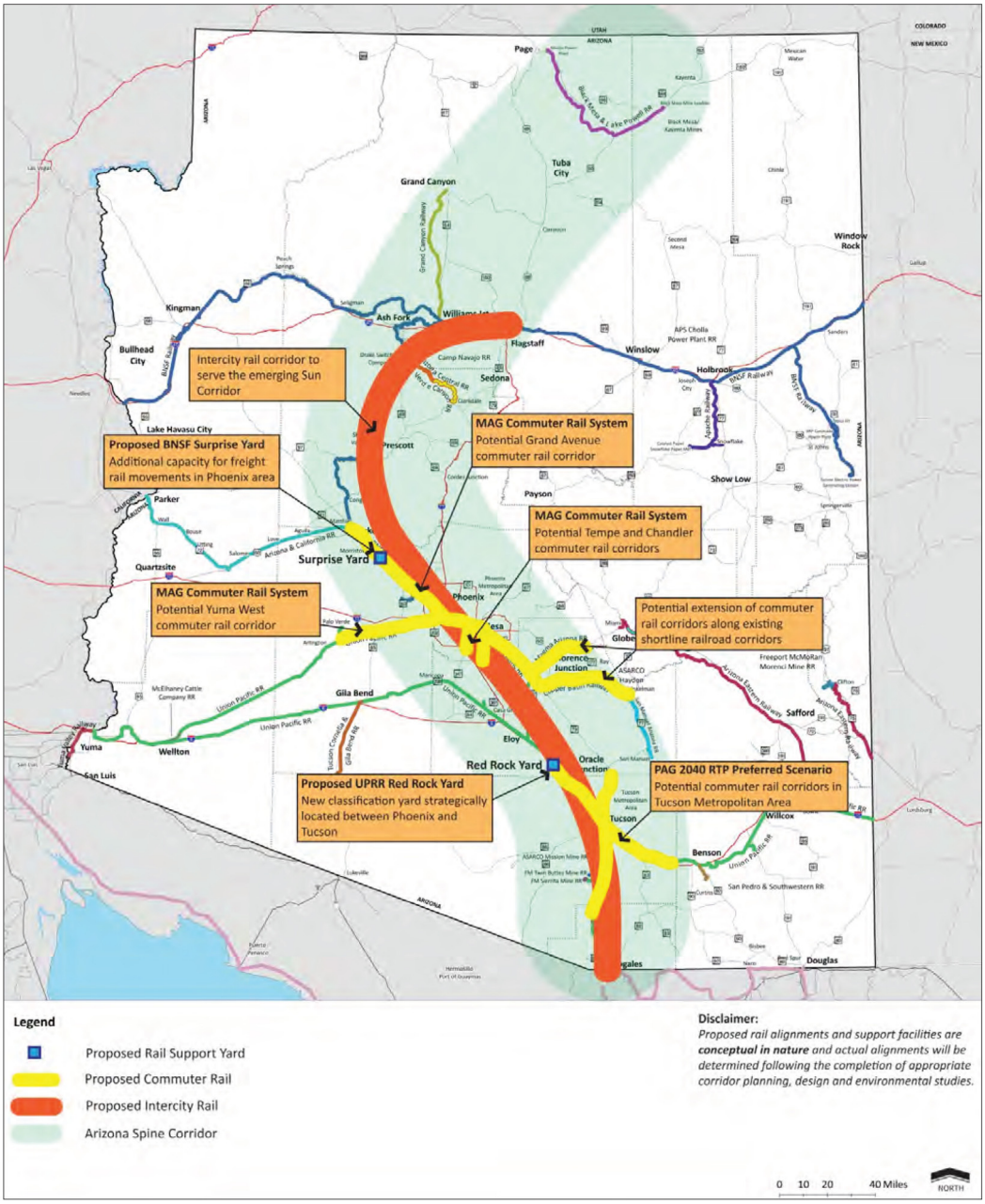
ADOT Arizona State Rail Plan

ADOT completed the Arizona State Rail Plan in 2011 and is slated to update this plan in late 2018. This plan is a comprehensive assessment of the passenger and freight needs in the state. Through this plan, the current rail system was assessed, infrastructure needs were determined with the intent of including rail projects into long-range planning processes in the State.

The State Rail Plan notes that one of the rail facilities in the state is the Buckeye Yard where switching activities are conducted. According to the plan, UPRR owns additional property to create a rail and truck logistics center that would support rail deliveries, if warranted by sufficient levels of economic activity.

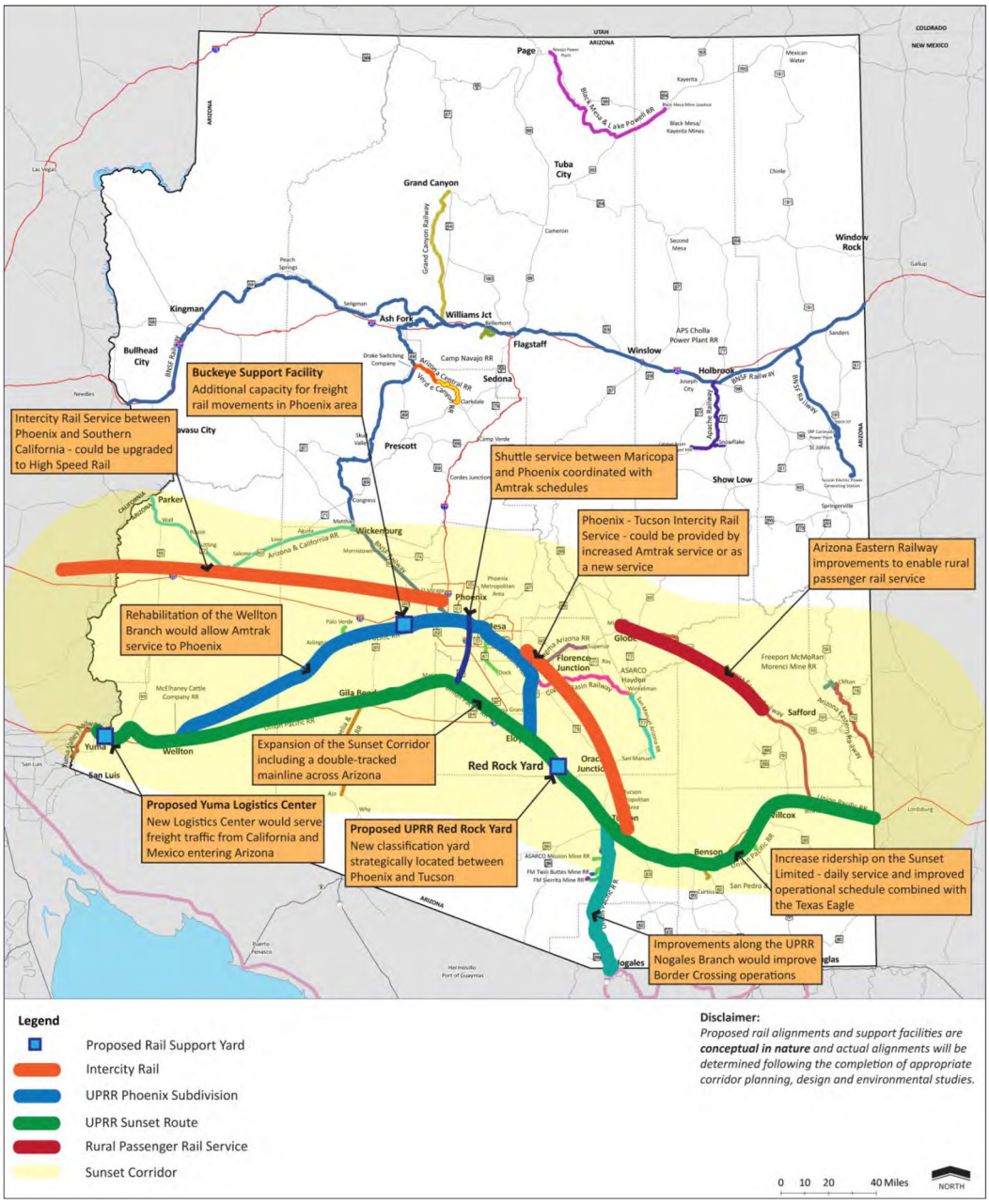
In addition to identifying proposed logistic centers, the plan also illustrates proposed Corridors of Opportunity, each which has specific strategies associated with them. These corridors are the Arizona Spine, CANMEX Corridor, Route 66 Corridor, and Sunset Corridor. The Arizona Spine Corridor and the Sunset Corridor include segments of Buckeye and are shown on **Figure 6-5 and Figure 6-6,** respectively. **Table 6-1** and **Table 6-2** list the implementation actions for the Arizona Spine Corridor and Sunset Corridor as outlined in the State Rail Plan.

Figure 6-5: ADOT Arizona State Rail Plan – Arizona Spine Corridor of Opportunity



Source: ADOT, Arizona State Rail Plan, 2011.

Figure 6-6: ADOT Arizona State Rail Plan – Sunset Route Corridor of Opportunity



Source: ADOT, Arizona State Rail Plan, 2011.

Table 6-1: State Rail Plan – Arizona Spine Corridor Implementation Actions

Implementation Action	Description
Short-Term (within 5 years)	
Phoenix to Tucson Intercity Rail Study	Establish a Locally Preferred Alternative and Environmental Clearance for the Phoenix to Tucson Intercity Rail corridor.
Amtrak Service to Phoenix	Route the Sunset Limited service to Phoenix.
Intermediate (within 19 years)	
Commuter Rail	Partner with MAG and PAG to plan commuter rail systems within the Phoenix and Tucson metropolitan areas.
Additional Amtrak	Establish more frequent Amtrak Service between Phoenix and Tucson, and if feasible between Phoenix and Los Angeles.
Short Line Assistance Program	Implement a program which can provide financial assistance for improvement sot short line railroads.
Intermodal and Freight Logistics Centers	Based on recommendations provided by the Freight and Rail Advisory Council, work with private sponsors to plan and implement new facilities at key locations. Public incentives could be established to promote facility development.
Long-term Implementation (within 20 years)	
Intercity rail service between Phoenix and Tucson	Design and construct an intercity rail system connecting Phoenix and Tucson.
Extensions of intercity rail throughout the Sun Corridor	Complete corridor studies and obtain environmental clearance for extensions of the intercity rail system north of Phoenix, and south of Tucson.
Freight Rail improvements to benefit Arizona communities	Implement feasible improvements within communities such as; Quiet Zones, rail realignments, or other improvements.

Source: ADOT Arizona State Rail Plan, 2016.

Table 6-2: State Rail Plan – Sunset Corridor Implementation Actions

Implementation Action	Decrisption
Short-Term (within 5 years)	
Partner with Amtrak	Increase frequency of service and modifications to the operation schedule.
Phoenix to Tucson Intercity Rail Study	Establish a Locally Preferred Alternative (LPA) and Environmental Clearance for the Phoenix to Tucson Intercity Rail Corridor
Amtrak Service to Phoenix	Route the Sunset Limited service to Phoenix.
Rehabilitation of the Wellton Branch	Reinstate rail service along the UPRR Wellton Branch.
Intermediate (within 19 years)	
Arizona Eastern Rural Passenger Rail Service	Partner with Arizona Eastern Railway to help acquire funding for improvements which would allow for rural passenger service.
Sunset Corridor Transcontinental Mainline	Implement improvement to the transcontinental rail corridors.
Intermodal and Freight Logistics Centers	Based on recommendations provided by the Freight and Rail Advisory Council, work with private sponsors to plan and implement new facilities at key locations. Public incentives could be established to promote facility development.
Long-term (within 20 years)	
Intercity rail service between Phoenix and Tucson	Design and construct an intercity rail system connecting Phoenix and Tucson.
Extensions of Intercity Rail throughout the Sun Corridor	Complete corridor studies and obtain environmental clearance for extensions of the intercity rail system north of Phoenix and south of Tucson.
Freight Rail Improvements to benefit Arizona communities	Implement feasible improvements within communities such as; Quiet Zones, rail realignments, or other improvements.

Source: ADOT Arizona State Rail Plan, 2016.

ADOT Passenger Rail Study: Tucson to Phoenix

ADOT began the Passenger Rail Study in 2011 and conclucded a record of decision in 2016. The purpose of the plan was to determine if a passengar rail system between Tucson and Phoenix was feasible. Through the Tier 1 Draft Environmental Impact Statement and the Record of Decision, the Yellow Corridor Alternative was selected to be further reviewed during Tier 2 studies, which is shown on Figure 6-7. the altneritve shows a passenger rail line extending in Buckeye.

Figure 6-7: ADOT Passenger Rail Study: Tucson to Phoenix –Preferred Alterative

Source: ADOT, Passenger Rail Study: Tucson to Phoenix, 2016.

6.6 Rail Recommendations

Rail recommendations are divided into three project types: commuter rail, rail crossings, and rail rehabilitation. Each of these project types are described in this section and illustrated on Figure 6-8.

Commuter Rail

Commuter rail recommendations are derived from MAG Commuter Rail System Study described in the previous section, of which Buckeye has been an active participant. The commuter rail recommendations from the 2010 Study and the 2018 Study Update include using existing railroads for commuter rail services in addition to freight services, which would provide commuters with an alternative mode of local and regional transportation. It is recommended that the City, in cooperation with MAG and the future commuter rail authority, implement the commuter rail route to Miller Road with the potential extension on the Wellton Branch west of the Buckeye MPA.

Table 6-3 includes the identified implementation actions from the draft 2018 Study Update. The City of Buckeye should continue to support and participate in implementation actions as an active MAG member agency.

Table 6-3: Commuter Rail Implementation Next Steps

Item	Responsible Party	Partners	Timeframe
1) Periodic Ridership Forecasting Updates	• MAG	• Local Jurisdictions	Ongoing
2) Coordination with Railroads	• ADOT • MAG • Railroads	• Local Jurisdictions • Valley Metro	Ongoing
3) Local Planning Efforts	• Local Jurisdictions	• MAG • ADOT	Ongoing
4) Address Enabling Legislation Regarding Liability and Indemnification	• ADOT • MAG	• Railroads	2018-2022
5) Coordination of Infrastructure Improvements with the Railroads, ADOT and Local Jurisdictions	• MAG • Local Jurisdiction • ADOT	• Railroads • Valley Metro	Ongoing
6) Identify Funding Commitments	• MAG • ADOT • Legislature	• Local Jurisdictions	2018-2022
7) Develop and Initiate Governance Plan	• MAG • ADOT	• Local Jurisdictions • Valley Metro	Following identification of local funding commitments
8) Initiate Process for Federal Funding	• MAG	• Local Jurisdictions	Following identification of local funding commitments
9) Preserve Future Options	• Commuter Rail Authority or Joint Powers Authority	• Local Jurisdictions • Railroads • MAG • CAG • ADOT	Ongoing

Source: 2018 Regional Commuter Rail System Study Update, Draft July 2018.

As indicated in Table 6-4 the commuter rail recommendations are divided into two primary action items.

Table 6-4: Rail Recommendations

Project Type	Location
Commuter Rail	Support the initial Commuter Rail Service from Baseline Road to Miller Road on Wellton Branch
Commuter Rail	Support the extension of Commuter Rail Service West of Miller Road on Wellton Branch

Source: City of Buckeye, Matrix Design Group, 2018.

Rail Crossings

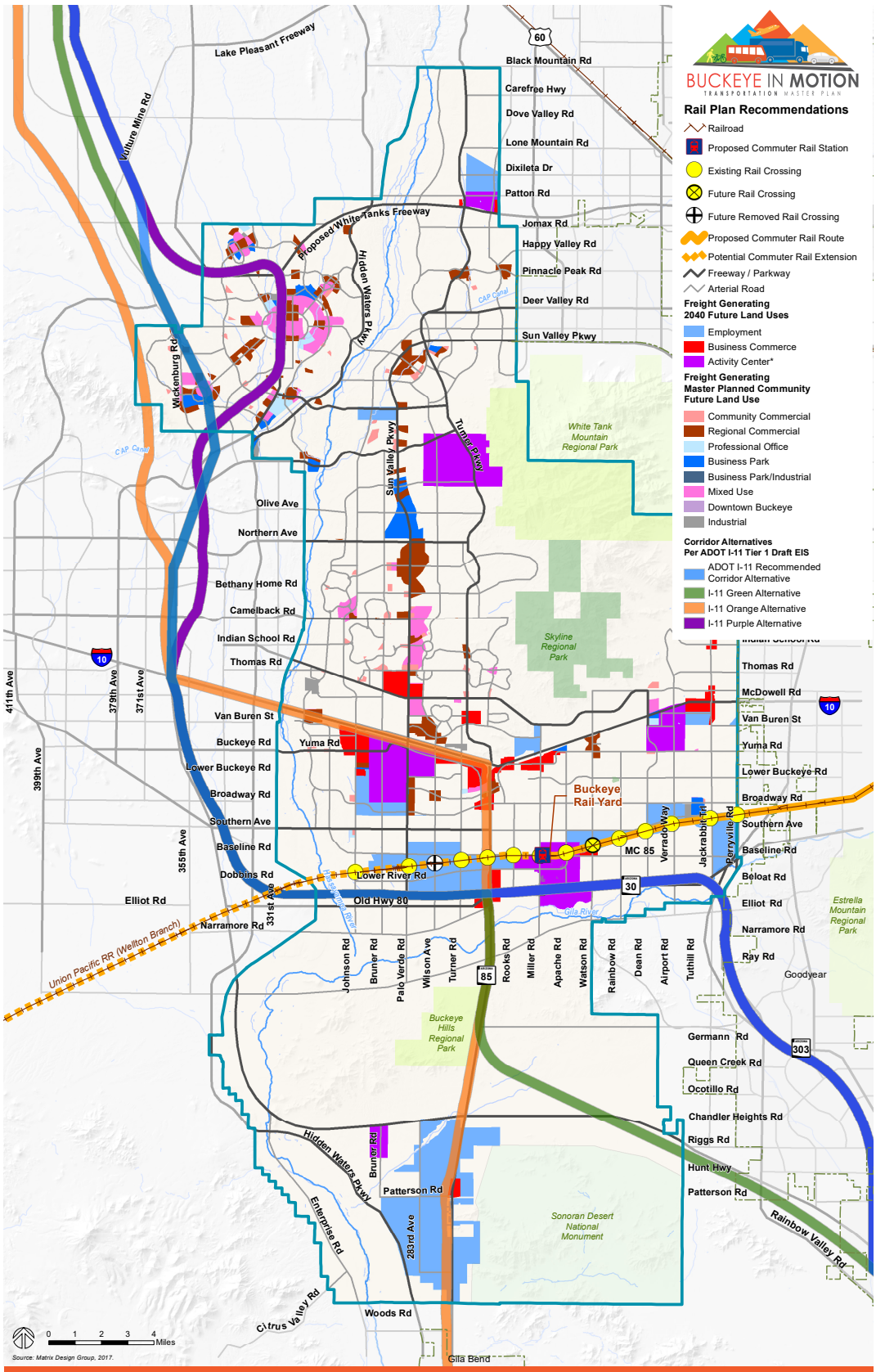
This plan recommends preservation of the existing at-grade rail crossings throughout Buckeye. Potential expansion of at-grade crossings or construction of grade-separated crossings will be evaluated in the future. Key rail crossings that should be preserved as the City continues to grow, include:

- 4th Street south of Baseline Road
- Apache Road north of Baseline Road
- Dean Road and Southern Avenue
- Jackrabbit Trail, between Southern Avenue and Broadway Road
- Johnson Road, north of Lower River Road
- Miller Road and Baseline Road
- Palo Verde Road, between Baseline Road and Lower River Road
- Perryville Road, between Southern Avenue and Broadway Road
- SR 85 and Baseline Road
- Turner Road and Baseline Road
- Verrado Way, north of Southern Avenue
- Watson Road, north of Baseline Road

The City may choose to study these crossing locations as potential candidate locations for grade-separated rail crossings in the future, when an increase in rail and/or vehicle traffic become a safety or mobility concern.

Wellton Branch Rehabilitation

The 2014 Wellton Branch Railroad Rehabilitation Study identified significant improvements necessary to reinstate intercity connection along the Wellton Branch rail line that would connect the Phoenix metropolitan area with California markets. The study indicates that additional freight generating land uses are needed along the rail corridor. The Imagine Buckeye 2040 General Plan supports this goal including locating future employment land uses along the rail corridor. Given MAG has determined to not proceed with the Wellton Branch Rehabilitation, specific railroad rehabilitation recommendations have not been included in the TMP. However, the City of Buckeye supports a future study of the Wellton Branch to determine appropriate timing of rehabilitation and reopening.



Matrix DESIGN GROUP

Figure 6-8
Rail Plan Recommendations

6.7 Rail Implementation and Funding

The following are potential funding sources that the City of Buckeye could consider for improvements to the rail system in Buckeye.

Funding

Funding for rail-related improvements are typically derived from Federal funding sources. Additionally, the potential addition of commuter rail could potentially be funded by an extension of the MAG region's Proposition 400 excise tax. Provided in this section is a description of the eligible funding sources.

Federal

As part of the Federal Highway Administration Highway Safety Improvement Program (HSIP), the Railway-Highway Crossings Program, also known as Section 130, provides funding for improvements at railway-highway crossing to eliminate hazards. Improvements include either separation, relocation, or protective devices. Funds are eligible for projects at all public crossings, including roadways, bike routes and trail, and pedestrian paths. ADOT administers this program in Arizona and receives approximately $2.3 million annually for such projects.

Federal Competitive Discretionary Grants

Although these programs are highly competitive, discretionary funding programs, such as the BUILD and INFRA discretionary grant programs provide an additional funding source for rail projects.

The **BUILD** (Better Utilizing Investments to Leverage Development) transportation discretionary grant program (formerly TIGER grants) are for regionally-significant roads, bridges, transit, rail, ports or intermodal transportation projects. The program has eight (8) overarching objectives that should be considered when determining if BUILD-eligible projects will compete well against national competition:

- Safety
- Economic competitiveness
- Quality of life
- Environmental protection
- State of good repair
- Innovation
- Partnership
- Non-Federal revenue for future transportation infrastructure investments

The **INFRA** (Infrastructure for Rebuilding America) discretionary grants (formerly FASTLANE grants) are a competitive funding source that can be used to fund a variety of infrastructure project costs including: reconstruction, rehabilitation, acquisition of property, environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance. The program has four overarching objectives that should be considered when determining if INFRA-eligible projects will compete well against national competition:

- Supporting Economic Vitality
- Leveraging Federal Funding
- Performance and Accountability
- Innovation
- Environmental Review and Permitting
- Special Experimental Authorities
- Safety and Technology

Proposed rail projects in this Chapter should be prioritized based on the metrics of the BUILD and INFRA programs. Although BUILD and INFRA are highly competitive federal funding programs, the criteria outlined in their Notice of Funding Opportunity (NOFO) are a consistent way to measure the recommended rail projects against regional and state competition for limited funds. Additionally, whenever possible, the City of Buckeye should work to align these recommendations with goals established in the Arizona State Rail Plan to be competitive when pursuing Section 130 Highway-Railroad Grade Crossing Safety Program funds.

Implementation

This Rail chapter identifies implementation recommendations for adding commuter rail and freight facilities in Buckeye. **Table 6-5**, **Table 6-6**, and **Table 6-7** provide a listing of the Short-term, Mid-term, and Long-term rail recommendations. The planning-level costs and other implementation actions associated with these recommendations are included in Chapter 9 Recommendations and Implementation.

Table 6-5: Short-term Rail System Recommendations

Project Name	Description	Sources
Identify Funding Commitments	In coordination with MAG and ADOT, identify funding commitments for infrastructure improvements.	MAG Commuter Rail System Study
At-Grade Rail Crossing Preservation	Preserve the rail crossings that are identified in Section 6.6.	TMP

Source: City of Buckeye, Matrix Design Group, 2018; MAG Commuter Rail System Study, 2018.

Table 6-6: Mid-term Rail System Recommendations

Project Name	Description	Sources
Coordinate Infrastructure Improvements	In coordination with UPRR and ADOT, coordinate infrastructure improvements.	MAG Commuter Rail System Study
Rail Crossings Study	Considering studying some of the rail crossings in Section 6.6 as potential candidate locations for grade-separated rail crossings in the future, when an increase in rail and/or vehicle traffic become a safety or mobility concern.	TMP

Source: City of Buckeye, Matrix Design Group, 2018; MAG Commuter Rail System Study, 2018.

Table 6-7: Long-term Rail System Recommendations

Project Name	Description	Sources
Commuter Rail Route Implementation	In cooperation with MAG and the future commuter rail authority, implement the commuter rail route to Miller Road with the potential extension on the Wellton Branch west of the Buckeye MPA.	TMP
Logistics Center Implementation	In cooperation with UPRR, implement a future logistics center at the Buckeye Yard if deemed necessary by UPRR.	ADOT State Rail Plan

Source: City of Buckeye, Matrix Design Group, 2018; ADOT State Rail Plan, 2011.

6.8 Summary

Rail is an important component in achieving economic development goals. Many previous rail plans or studies have been conducted for the area which have identified railroad rehabilitation efforts and commuter rail service. In support of those efforts, the City of Buckeye incorporates the draft commuter rail recommendations. Furthermore, this TMP identifies the existing at-grade rail crossings as key crossings to be preserved. Additionally, some of these at-grade rail crossings should be studied as potential grade-separated rail crossings if increased vehicle and rail traffic become a safety concern or affect the mobility of the transportation network.

Notably, the Hassayampa Valley Rail Corridors Cost Analysis Update and the Wellton Branch Railroad Rehabilitation Study recommendations have not been incorporated in this TMP. Although the City of Buckeye supports the goals envisioned in these studies, both studies have not garnered the necessary regional support for interagency cooperation and funding. The City of Buckeye supports a future study of the Wellton Branch to determine appropriate timing of rehabilitation improvements and reopening of the rail line.

Recommendations of this Rail chapter are incorporated in Chapter 9 (Recommendations and Implementation) of this TMP along with the recommendations of other TMP Plan Elements (streets, transit, active transportation, aviation, freight, and ITS).

Please see the next page.

7.1 Introduction

Economic development and diversification, such as manufacturing, agriculture technology, and retail, are dependent on the ability for the movement of goods and freight. This movement can occur through trucks, rail, and air carriers. Because the movement of goods can occur through different modes of transportation, the freight network should be planned to ensure that there is optimal connectivity for the efficient distribution of goods. This Chapter includes the recommended truck routes for the roadway network to enhance connectivity. Included in the Freight Chapter are the following sections:

- Section 7.1 **Introduction**. Freight chapter purpose and contents.
- Section 7.2 **Existing Freight Facilities**. Freight infrastructure that exists in the Buckeye planning area.
- Section 7.3 **Imagine Buckeye 2040 General Plan.** Relevant goals, policies, and implementation actions that support the establishment of freight routes, and associated compatible land uses in Buckeye.
- Section 7.4 **Multimodal Integration.** The integration of freight in the Buckeye transportation network.

- Section 7.5 **Relevant Freight Plans**. Previous plans and studies that support the recommendations of the Freight Chapter.
- Section 7.6 **Freight Recommendations**. Recommendations for designated truck routes, aviation facilities, and rail facilities that support freight.
- Section 7.7 **Freight Implementation and Funding**. Implementation and potential funding sources to assist in implementing the recommendations.
- Section 7.8 **Summary.** Summary of the Freight Chapter.

7.2 Existing Freight Facilities

Understanding the existing freight facilities within the planning area is a necessary step before planning for future freight mobility. The following are the freight services that are existing in Buckeye.

Truck Freight

While many cities have designated freight corridors for truck routes, Buckeye currently does not have a designated freight network. Truck traffic in Buckeye consists of commercial delivery trucks and heavy trucks from industrial uses. Within the Buckeye MPA only state highways and interstates are designated as part of the National Highway Freight Network (NHFN), making these highways eligible for Federal formula funds. These NHFN designated corridors include I-10, SR 85, US 93/US 60. MC85 and Bell Road are all locally-designated freight routes in the neighboring communities of Surprise and Goodyear. Litchfield Park located east of the City does not have any designated routes.

In addition to the aforementioned highways, the future I-11 Interstate corridor is envisioned as a major north-south transcontinental high capacity corridor connecting cities, trade hubs, ports, intersecting highways as well as railroads and extending from Mexico, through Buckeye and the Hoover Dam into Nevada and beyond to the Canadian border. The future I-11 has been commonly referred to as a NAFTA (North American Free Trade Agreement) corridor or the Canamex Corridor. Therefore, I-11 will be an internationally-significant route serving trade between Canada, the United States, and Mexico and providing additional and much needed freight capacity through the intermountain west region of the United States. Furthermore, I-11 will fill an important gap in the interstate highway network, connecting the Las Vegas and Phoenix metropolitan areas. The future I-11 corridor is intended as a multi-use corridor that will improve Buckeye's and Arizona's access to regional and international markets, while opening up new opportunities for enhanced travel, mobility, trade, commerce, job growth and economic competitiveness. As such, freight traffic in Buckeye will increase significantly in the future. Arizona Department of Transportation (ADOT) is currently funding and conducting the first step of a tiered environmental study to identify the specific corridor for the future I-11 highway. The corridor will be finalized in Fall, 2020. Further discussion on the I-11 corridor can be found in Chapter 2 Streets.

Buckeye, and the rest of the state has a shortage of safe truck parking as identified in the Arizona State Freight Plan by ADOT. Due to high prices at parking centers, freight truck drivers have begun

to park in random parts throughout the community. This is also an issue for freight truck drivers who make day trips to California, returning to their home the same day.

Rail Freight

Existing rail freight facilities in Buckeye are provided by the Union Pacific Railroad (UPRR), which provides connections to California and New Mexico. The UPRR includes the Wellton Branch segment, of which a portion is inactive, limiting connectivity between Buckeye and Wellton. The rail line also includes the Buckeye Yard, where rail switches occur. Further description of the UPRR in Buckeye is provided in Chapter 6 Rail.

Airport Freight

Buckeye Municipal Airport is the local airport that serves Buckeye. This airport is used for general aviation, which currently does not include commercial cargo services. As noted in Chapter 5, Aviation, the airport will serve as an economic hub, guided by the Imagine Buckeye 2040 General Plan and a future update to the Buckeye Municipal Airport Master Plan. Further description of the Buckeye Municipal Airport is provided in Chapter 5 Aviation.

7.3 Imagine Buckeye 2040 General Plan

The Imagine Buckeye 2040 General Plan identified recommendations relevant to the establishment of truck routes and connectivity of industries throughout the city. These goals, policies, and implementation actions are utilized in the development of the truck route recommendations in Section 7.6 of this Chapter. Applicable goals, policies and implementation actions from the Imagine Buckeye 2040 General Plan are identified in this section.

Designated Truck Routes

The identification and designation of truck routes is important for connecting different industries in Buckeye, but also for the region's freight mobility goals. In doing so, it is also important to ensure that the roadways and surrounding land uses are not adversely impacted by truck traffic. For example, the roadways must be able to withstand the continuous wear on the roadway from heavy freight truck vehicles. Additionally, land uses must be compatible with the industries that freight supports.

Truck traffic can generate excessive wear and tear on roadway facilities. Considerable national research has shown that large delivery trucks can cause the equivalent damage of 163 cars and long haul semi-trailers can cause the equivalent damage of 1,408 cars, making it necessary to plan for specific truck routes throughout the city. Another factor supporting truck routes is land use.

Land uses compatible with freight opportunities include industrial, office, commercial, and agricultural. These are all uses that benefit from the distribution capabilities of freight and trucking. Within these land uses are expected to be facilities compatible with trucking, such as areas that provide parking for 18-wheelers. Land uses that are incompatible with freight opportunities are residential and active recreation open spaces.

While the City of Buckeye has limited designated truck routes, the Imagine Buckeye 2040 General Plan establishes policy for the creation of additional routes, thereby supporting commercial and industrial growth in the city. The following goals, policies, and implementation action from the Imagine Buckeye 2040 General Plan supports the development of truck routes:

- **Goal S-9** Buckeye is a connected community with an efficient multimodal transportation network.
  - **Policy S-9.8** The City of Buckeye will actively promote and lobby for the expansion and development of new key transportation facilities, including commuter rail and other regional transportation opportunities.
- **Goal S-11** Buckeye has a roadway system that is safe and efficient.
  - **Policy S-11.4** The City of Buckeye should designate appropriate truck routes that provide efficient connections to industrial and commercial uses and do not adversely impact residential land uses.
    - **Action 40.** Develop a truck route plan. (Mid Term)

Freight in Relation to Economic Development

In addition to goals and policies that support truck routes, there is also a goal and policy in the Imagine Buckeye 2040 General Plan that encourage economic development that is reliant on the export of goods, which is dependent on freight facilities in Buckeye:

- **Goal G-14** Buckeye has low unemployment, is economically stable, and has a high standard of living.
  - **Policy G-14.1** The City of Buckeye's economic development strategic plan should focus on that attraction of 'Base' industries

These collective goals, policies, and implementation action underscore a need for a freight system that supports regional economic activity. Provided in this Freight Chapter are transportation recommendations that support these goals.

7.4 Multimodal Integration

The freight network enhances the distribution system in Buckeye. The truck network in the City can connect with the rail network to provide further connectivity for the distribution of goods. Another mode that could support the distribution of goods is aviation. At present, there is no truck route that is connected to Buckeye Municipal Airport. In order for the airport to have freight capabilities, such as importing or exporting cargo, an additional 3,000 to 4,000 feet of runway would need to be extended to the existing 5,700-foot runway. This would be in addition to other runway improvements for the weight and size of cargo type aircraft. If and/or when such addition or expansion occurs at the airport, truck routes will especially be needed to distribute goods that would be carried into and out of the airport. Although there are no commercial cargo operations existing at the Buckeye Municipal Airport, the businesses there may require the delivery of goods, which would also necessitate the need to designate a truck route that circulates by the airport. To create an expansive freight network, rail, truck, and aviation transportation should be integrated.

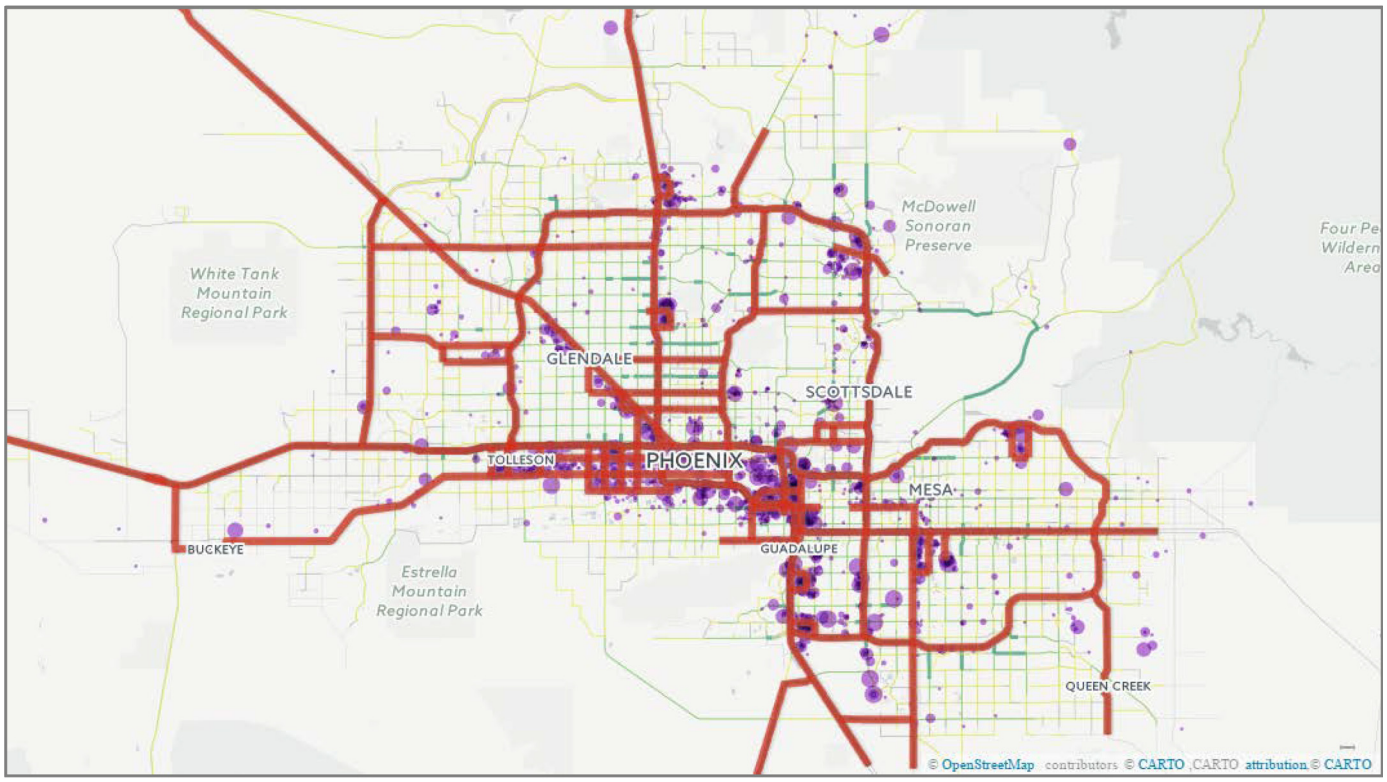
Additionally, due to the nature of the truck system in Buckeye, the truck routes share the street network with commuters in vehicles and transit routes. While this creates an integrated network, potential impacts from truck traffic on roadways, such as road surface deterioration and congestion, should continuously be evaluated to ensure that this use does not impact the ability for other modes of transportation to safely travel the roadways in Buckeye.

7.5 Relevant Freight Plans

Regional Freight Network Technical Memoranda

MAG is currently in the process of preparing the Regional Freight Network report with the most recent draft published in April 2017. The draft report identifies existing freight infrastructure assets, network usage, network performance, and proposes a roadway freight network throughout Maricopa County. The roadway freight network is based on truck annual average daily traffic (AADT) estimates, industrial employment, and other network conditions, and designates regional truck routes on I-10, SR 85 and MC 85 within Buckeye. Figure 7-1 shows the draft freight network, showing truck AADT in green and industry employment in purple. The designation of the regional truck routes has the potential to inform ADOT and federal street classifications as the roadways must be able to accommodate the use of trucks.

Figure 7-1: MAG Regional Freight Network Report – Draft Freight Network



Source: MAG Regional Freight Network Technical Memoranda 1 and 2, 2017.

MAG State Route 30/Tres Rios Freeway Scoping Study

In 2018 MAG intends to initiate a Scoping Study for the future State Route 30/Tres Rios Freeway (SR 30 Study) which will run parallel to the UPRR line. The SR 30 Study will identify the preferred alignment for the freeway and provide additional clarification to the preferred traffic interchange locations. Once the interchange locations are determined, extensions of locally designated truck routes and supporting rail crossing improvements will need to be further evaluated.

ADOT Arizona State Rail Plan

ADOT completed the Arizona State Rail Plan in 2011. This plan is a comprehensive assessment of the passenger and freight needs in the state. In addition to commuter rail recommendations, as noted in Chapter 6 Rail, the Rail Plan also identified a proposed logistic center at the Buckeye Yard. This opportunity was identified for the Sunset Corridor, which is shown on **Figure 6-6** in Chapter 6, Rail. UPRR has purchased the property needed for this center and if deemed warranted, this center would support rail deliveries.

7.6 Freight Recommendations

Freight related recommendations in this TMP consist of designated truck routes along existing and future arterial and parkway corridors, the establishment of freight as an economic development goal for the Buckeye Municipal Airport, and the support of freight movement along the UPRR rail line. The convergence of these three assets (truck routes, interstates, airport, and rail) provide Buckeye with a strategic opportunity to become an intermodal hub in the Phoenix region. The combined rail, airport, and truck route recommendations for this Freight Chapter are illustrated on **Figure 7-2** and described in this section. Figure 7-2 includes the Imagine Buckeye 2040 General Plan future land use designations that would influence or that would be impacted by freight.

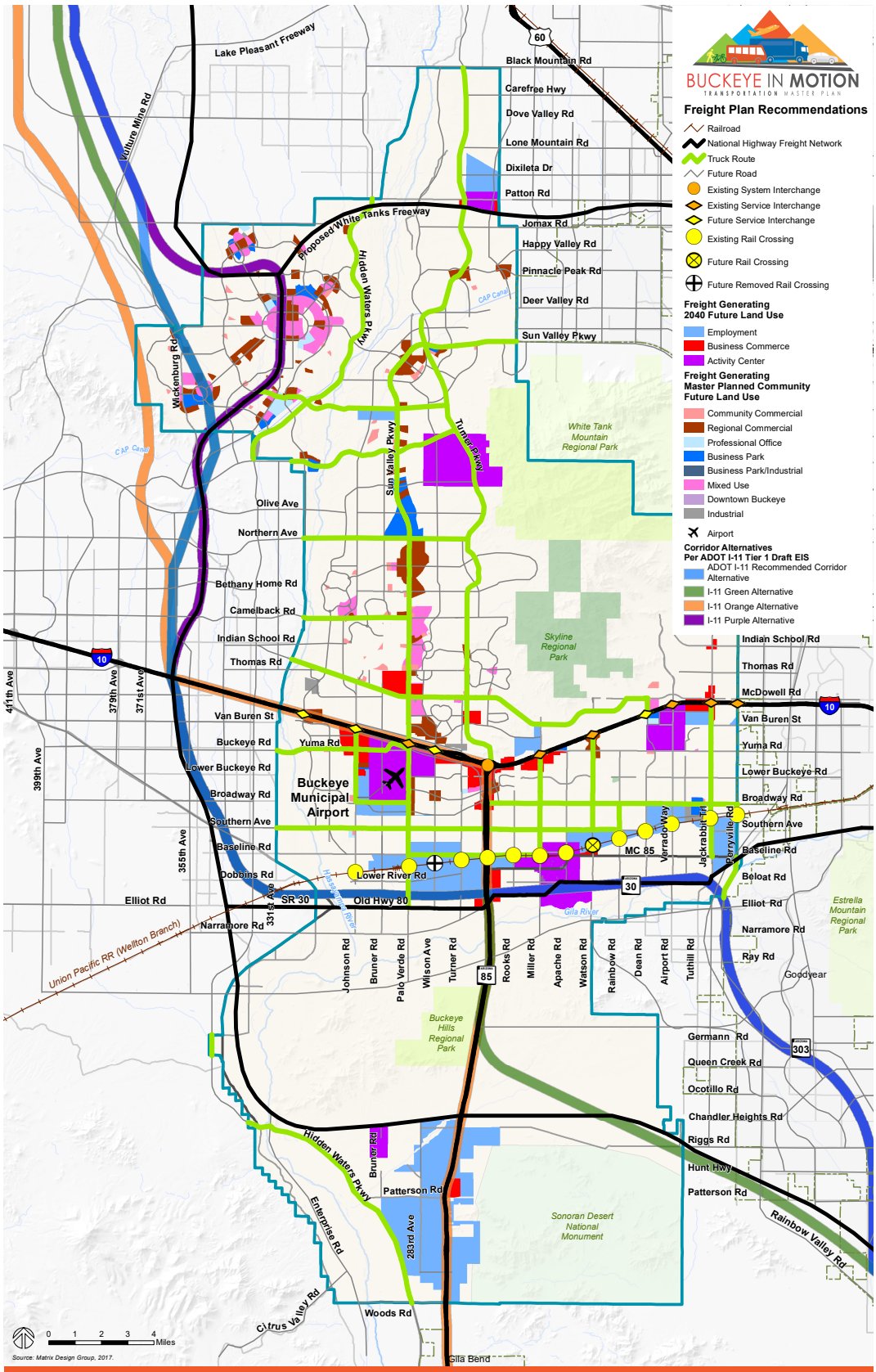


Figure 7-2
Freight Plan Recommendations

Truck Freight Recommendations

Freight truck mobility within Buckeye is needed for the distribution of goods, commercial deliveries, and the distribution of materials from industrial businesses. Specific roadways are recommended as designated truck routes to manage the safety, maintenance, and levels of congestion on the roadway network as well as for the efficient movement of goods. Although commercial truck traffic will not be exclusively restricted to these routes, the truck route designation will indicate the most appropriate and efficient route for trucks to travel to truck-generating land uses. Furthermore, the designated truck routes will also facilitate appropriate land use planning along these routes.

Because trucking is reliant on regional roadway networks, the recommended truck routes in Buckeye are located on existing and proposed parkways, arterial roadways with access to parkways, or arterial roadways with access to an interstate or highway.

The truck route recommendations were derived by identification of arterial and parkway roadways in Chapter 2, Street Chapter as well as the locations of truck-generating land uses identified in the Imagine Buckeye 2040 General Plan. Additionally, truck routes were planned to ensure that existing and future economic drivers that depend on truck services, such as Buckeye Municipal Airport and retail south of I-10, have access to the routes.

Regional connectivity is important for the movement of freight; therefore, it was important to consider routes that would extend into neighboring jurisdictions. In Surprise, Bell Road is a designated truck route, which would continue on Sun Valley Parkway into Buckeye. Additionally, Jackrabbit Trail in Surprise is a designated truck route, with connectivity to I-10 and MC 85. In Goodyear, I-10 and MC 85 are both designated as truck routes, which would extend the MC 85 truck route west connecting to SR 85 and extending the existing truck route on MC85.

Several freeways within Buckeye are NHFN designated freight routes including I-10, SR 85, the future I-11, as well as nearby US 60/US 93. Although the future SR 30 and White Tanks Freeway have not been identified as a NHFN route, the City of Buckeye recognizes this future highway as an important part of the truck route network.

The roadways recommended as designated truck routes are listed in Table 7-1.

Table 7-1: Designated Truck Route Recommendations

Roadway Name	Extends From	Extends To	Designated
Baseline Road	Miller Road	319th Avenue	City
Broadway Road	Palo Verde Road	Johnson Road	City
Broadway Road	Perryville Road	SR 85	City
Camelback Road	Turner Parkway	319th Avenue	City
Dove Valley Road	MPA Boundary	MPA Boundary	City
Future Greenway Parkway	Turner Parkway	Future I-11	City
Future Hidden Waters Parkway	MPA Boundary	Woods Road	City
Future Hidden Waters Parkway	MPA Boundary	MPA Boundary	City
Future Hidden Waters Parkway	339th Avenue	Patton Road	City
Future I-11	Dove Valley Road	Riggs Road	NHFN
Future SR 30	Perryville Road	Future I-11	NHFN
Future White Tanks Freeway	Future I-11	MPA Boundary	NHFN
I-10	Perryville Road	331st Avenue	NHFN
Jackrabbit Trail	McDowell Road	Baseline Road	City
Johnson Road	I-10	Broadway Road	City
MC 85	Perryville Road	Palo Verde Road	City
McDowell Road	Perryville Road	319th Avenue	City
Miller Road	I-10	Future SR 30	City
Northern Avenue	Turner Parkway	319th Avenue	City
Palo Verde Road	I-10	Narramore Road	City
Rainbow Road	Broadway Road	Southern Avenue	City
Southern Avenue	Palo Verde Road	331st Avenue	City
SR 85	I-10	Woods Road	NHFN
Sun Valley Parkway	251st Avenue	I-10	City
Turner Parkway	Black Mountain Road	I-10	City
Watson Road	I-10	Future SR 30	City
Wintersburg Parkway	Turner Parkway	339th Avenue	City
Yuma Road	Palo Verde Road	331st Avenue	City

Source: City of Buckeye, Matrix Design Group, 2018..

Rail Freight Recommendations

As noted in Chapter 6 Rail, the UPRR rail line intersects with SR 85 and will intersect the future I-11 corridor once it is developed. These intersections present an opportunity to develop the intersections into freight hubs where truck freight and rail freight can come together to provide connectivity. Due to the potential truck freight traffic and rail line accessibility, it is also recommended that the City evaluate the potential for creating crossings that do not overlap with vehicular traffic on the street network.

Additionally, there is future potential for UPRR to establish a logistics center at the Buckeye Yard if deemed necessary by levels of economic activity. This would expand the capacity of goods that can be imported and exported via rail lines and the transfer of cargo to trucks. The City of Buckeye should work with UPRR to study the feasibility of establishing this logistics center.

Air Freight Recommendations

As noted in Section 7.4, there is a need to increase Buckeye Municipal Airport's runway to accommodate freight capacities for importing and exporting goods. One of the recommendations in Chapter 5 Aviation Chapter is to update the Buckeye Municipal Airport Master Plan – this update should include an evaluation of freight capabilities at the airport and the necessary runway extensions to accommodate such capacity. The update should also consider implications that runway additions or extensions would have on surrounding land uses.

7.7 Freight Implementation and Funding

This section describes the available funding sources and the anticipated timeline for implementation of recommendations described in this chapter.

Funding

The following are potential funding sources and programs that the City of Buckeye could consider for implementation of the recommendations for truck, rail, and aviation freight services in Buckeye. Provided below are the applicable federal, state and regional funding sources.

Federal Funds

Roadway infrastructure for freight may be funded through the freight funds established through the FAST Act. FAST Act is the current funding and authorization bill to govern United States federal surface transportation spending. There are two federal sources of freight funds – formula funds, which are apportioned to each state, and discretionary grant programs (INFRA and BUILD), each of which are described in this section.

FAST Act Formula Funds

The FAST Act formula funds provide approximately $1.2 billion per year for the National Highway Freight Program, which has a focus on the improvement of freight on the National Highway Freight Network (NHFN). The NHFN includes the Primary Highway Freight System (PHFS), critical rural and urban freight corridors, which are designated by the State or an MPO, and the portions of the Interstate highways that are not part of the PHFS. The 2017 Arizona State Freight Plan conducted an assessment and scoring process to determine the highest priority projects to utilize NHFN funds for implementation of projects. Ranking sixth (6th) in the state for overall freight benefit, adding a general purpose lane to I-10 in Buckeye is listed as a high priority project to be implemented in FY 2019.

Additionally, SR 85, US 93/ US 60, and the future I-11 in or near Buckeye are all considered critical freight corridors by ADOT and are therefore eligible corridors for FAST Act formula funds. Commonly referred to as Key Commerce Corridors, these highways are integral to the state highway system and Arizona's continued economic growth and development. Overall, FAST Act funds address only two percent (2%) of the needs identified in the 2017 Arizona State Freight Plan and should currently not be considered a source for local freight-related needs.

Discretionary Funds

The **BUILD** (Better Utilizing Investments to Leverage Development) transportation discretionary grant program (formerly TIGER grants) are for regionally-significant roads, bridges, transit, rail, ports or intermodal transportation projects. The **INFRA** (Infrastructure for Rebuilding America) discretionary grants (formerly FASTLANE grants) are a competitive funding source that can be used to fund various infrastructure project costs including: reconstruction, rehabilitation, acquisition of property, environmental mitigation, construction contingencies, equipment acquisition, and operational improvements directly related to system performance. Additional descriptions of these funds are in Chapter 5 Aviation.

Highway Safety Improvement Program

The Highway Safety Improvement Program (HSIP) is a federal-aid program aimed at a reduction in traffic fatalities and injuries on public roads, including non-state-owned roads and roads on tribal land. HSIP consists of three components, the Strategic Highway Safety Plan, State HSIP, and the Railway-Highway Crossing Program (RHCP).

For aviation related freight, there is the **Airport and Airway Trust Fund (Trust Fund)**, which is a federal fund, provided by taxes on airline ticket sales, aviation fuel, air cargo, and the flight segment tax. Airport improvements can also be implemented through the **Airport Improvement Program (AIP)**, which is a funding mechanism for public agencies to receive funding for public-use airports. Additional descriptions of these funds are in Chapter 5 Aviation.

State Programs

State programs for freight include programs that have a focus on airport improvements. At the state level, funds for airports are sourced through the **State Aviation Fund**, which are allocated through the **Airport Capital Improvement Program**, developed by ADOT. The Airport Capital Improvement Program maximizes the use of both state and FAA funds. ADOT also has an **Airport Loan Program**, which provides funding for airport improvements to eligible airports to improve the economic status of the airport. Additional descriptions of these programs are in Chapter 5 Aviation.

Regional Program

Regional funds applicable to freight opportunities in Buckeye include the Arterial Life Cycle Program, which is administered by MAG.

Arterial Life Cycle Program

The MAG Arterial Lifecycle Program (ALCP) serves as a financial tool for the arterial street component of the Regional Transportation Plan (RTP). The program provides information for projects spanning the 20-year life including location, regional funding, years of work, type of work, status of the project and the lead agency

Implementation

This Freight chapter identifies implementation recommendations for adding to the capacity of the freight network in Buckeye. **Table 7-2**, **Table 7-3**, and **Table 7-4** provide a listing of the Short-term, Mid-term, and Long-term recommendations respectively. Planning-level costs and other factors related to the implementation of these actions are included in Chapter 9 Recommendations and Implementation.

Table 7-2: Short-term Freight Recommendations

Project Name	Description	Sources
Truck Route Designation	Designate the roadways listed in Table 7-1 as truck routes.	TMP

Source: City of Buckeye, Matrix Design Group, 2018.

Table 7-3: Mid-term Freight Recommendations

Project Name	Description	Sources
Industrial Hub Development	Consider developing industrial hubs at the intersection of the UPRR rail line and the SR 85 and future I-11 intersections.	TMP
Buckeye Municipal Airport Master Plan Update	Include a freight related evaluation in the Buckeye Municipal Airport Master Plan Update.	TMP

Source: City of Buckeye, Matrix Design Group, 2018; Buckeye Municipal Airport Master Plan, 2007.

Table 7-4: Long-term Freight Recommendations

Project Name	Description	Sources
Logistics Center Feasibility Study	In coordination with UPRR, study the feasibility of establishing a logistics center at UPRR.	TMP

Source: City of Buckeye, Matrix Design Group, 2018.

7.8 Summary

The City of Buckeye understands the importance of freight mobility in achieving economic development goals. Many previous freight plans or studies have been conducted for the area which have identified freight route planning. In support of those efforts, the City of Buckeye incorporates the NHFN designated truck routes. Furthermore, this TMP identifies a network of locally designated truck routes.

Recommendations of this Freight Plan are incorporated in Chapter 9 (Recommendations and Implementation) of this TMP along with the recommendations of other TMP Plan Elements (streets, transit, active transportation, aviation, rail, and ITS).

INTELLIGENT TRANSPORTATION SYSTEM 8

8.1 Introduction

Intelligent Transportation Systems (ITS) is the integration of advanced sensor, computer, electronics and communication technologies, and management strategies to improve the overall safety and efficiency of the surface transportation system. Types of ITS may include traffic signals, cameras, fiber optic communications, and central management software. While ITS encompasses many technical attributes of the roadway, it should be noted that ITS is different than other communication systems.

Traffic operations are influenced by various factors, including signage and traffic signals. This chapter summarized the recommendations of the 2018 ITS Strategic Plan for the City of Buckeye. The following sections are in the ITS Chapter:

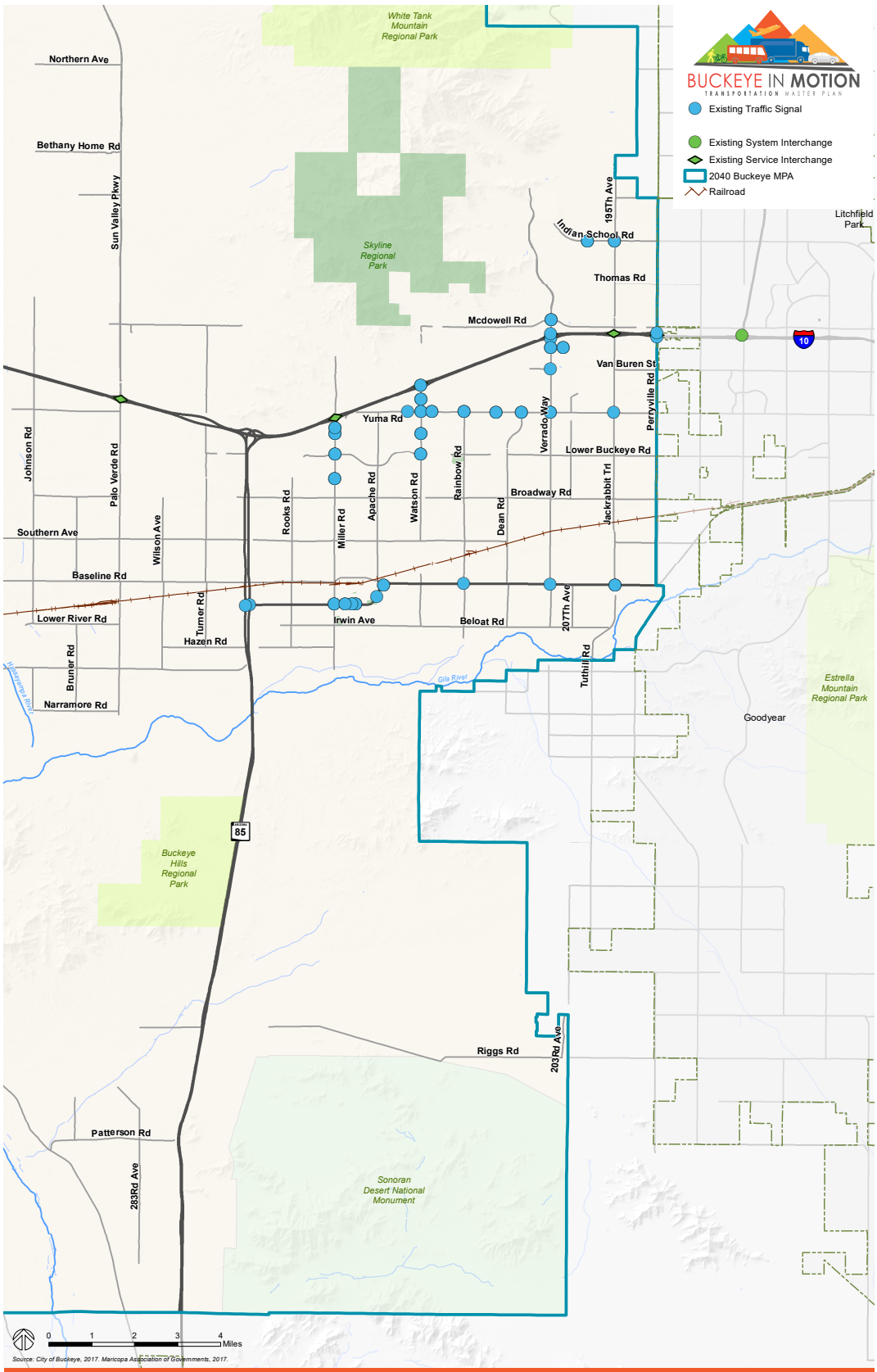
- Section 8.1 **Introduction**. ITS Chapter purpose and contents.
- Section 8.2 **Existing ITS Infrastructure.** ITS infrastructure that exists in the City of Buckeye.
- Section 8.3 **Imagine Buckeye 2040 General Plan**. Relevant policies from the Imagine Buckeye General Plan that have the potential to impact ITS in Buckeye.
- Section 8.4 **Multimodal Integration.** An overview of how ITS is related to modes of transportation in Buckeye.

- Section 8.5 **Relevant ITS Plan.** Relevant previous plans and studies that support the recommendations of the ITS Chapter.
- Section 8.6 **ITS Recommendations.** Recommendations of the 2018 ITS Strategic Plan for the City of Buckeye.
- Section 8.7 **ITS Implementation and Funding.** The process of implementation and the potential funding sources to assist in ITS plan implementation.
- Section 8.8 **Summary.** Summary of the ITS Chapter.

8.2 Existing ITS Infrastructure

Currently, there are 22 intersections in Buckeye that are active and controlled by the City through ITS. These are controlled via traffic signals, while all other intersections are controlled via stop signs. As illustrated in **Figure 8-1** and listed on **Table 8-1**, the 22 intersections with traffic signals are mainly located on the east side of SR 85 and south of I-10, although there are a few located at intersections east of Skyline Regional Park and north of I-10. In addition to the signals controlled by the City, there are others that are controlled by ADOT and some that are controlled by Maricopa Association of Governments (MAG).

Also illustrated in **Figure 8-1** is the location of service interchanges (which connect freeway traffic to local streets) and system interchanges (which carry traffic from one freeway to another utilizing ramps). Another existing ITS infrastructure component is a pedestrian crosswalk flasher on MC 85 near Narramore Avenue. With anticipated growth, there will be a need to integrate additional traffic signals especially as traffic volumes increase on the roadway system and at service interchanges.



Matrix DESIGN GROUP

Figure 8-1
Existing Traffic Signals

Table 8-1 Existing 2018 Traffic Signals

Existing Traffic Signal Location	Existing Traffic Signal Location
City of Buckeye Traffic Signals	
• Durango Street and Watson Road	• Roosevelt Street / No name (not active)
• Indian School Road and Jackrabbit Trail	• Verrado Way and McDowell Road
• Indian School Road and Pioneer Drive	• Verrado Way and Roosevelt Street (not active)
• Lower Buckeye Road and Miller Road	• Verrado Way and Van Buren Street
• Lower Buckeye Road and Watson Road	• Watson Road and Sundance Avenue
• Miller Road and Warner Street	• Yuma Road and 237th Lane
• Miller Road and Durango Street	• Yuma Road and Dean Road
• Miller Road and Pima Street	• Yuma Road and Rainbow Road
• Monroe Avenue and 4th Street	• Yuma Road and Sundance Parkway
• Monroe Avenue and 6th Street	• Yuma Road and Verrado Way
• Monroe Avenue and 7th Street	• Yuma Road and Watson Road
• Monroe Avenue and Eason Avenue	• Yuma Road and Windmill Village Boulevard / 221st Avenue
• Monroe Avenue and Miller Road	
MCDOT Traffic Signals	
• Baseline Road and MC 85	• MC 85 and Rainbow Road
• MC 85 and Apache Road	• MC 85 and Verrado Way
• MC 85 and Jackrabbit Trail	• Yuma Road and Jackrabbit Trail
ADOT Traffic Signals	
• I-10 and Perryville Road	• I-10 and Watson Road
• I-10 and Verrado Way	• SR 85 and MC 85

Source: City of Buckeye, 2018.

8.3 Imagine Buckeye 2040 General Plan

ITS policies for Buckeye are found in the Imagine Buckeye 2040 General Plan. The Imagine Buckeye General Plan identified one ITS-related policy that should be addressed in implementing this ITS Chapter.

- Goal S-9 Buckeye is a connected community with an efficient multimodal transportation network.
  - Policy S-9.1 The City of Buckeye will require new development to provide connectivity to existing transportation networks to provide accessibility and efficient connections to adjacent parcels, neighborhoods, Activity Centers, and the region.
  - Policy S-9.3 The City of Buckeye should ensure that the transportation network is managed, operated, and maintained efficiently.
- Goal S-11 Buckeye has a roadway system that is safe and efficient.
  - Policy S-11.5 The City of Buckeye should continue to support the update and implementation of the Intelligent Transportation Systems (ITS) Master Plan [Strategic Plan].

This policy supports the continued implementation of the existing 2018 ITS Strategic Plan, and thus the recommendations from the ITS Strategic Plan are reflected in this chapter. The support of ITS through the General Plan and the ITS Plan are necessary as ITS can be utilized on the whole roadway network. Improving safety and efficiency on the roadway network not only benefits commuters, but also residences, business owners, and all those visiting Buckeye destinations.

8.4 Multimodal Integration

ITS is a factor in reducing congestion on roadways, contributing to efficiency and safety. Because of this, ITS is highly connected and influential to all modes of transportation. This system of interconnected communications not only provides interconnectivity for the multimodal network in Buckeye, but the region as well. The ITS system will be a central component in implementing the freight network, transit network, and roadway network and ensuring that all of these networks are integrated have safe access to transit hubs, rail stops or logistic center, and the Buckeye Municipal Airport. Additionally, ITS is also a factor in creating a safe environment for active transportation, such as at cross walks.

8.5 Relevant ITS Plan

2018 ITS Strategic Plan for the City of Buckeye

To support a safe roadway system, the City developed an ITS Strategic Plan in 2018. The 2018 ITS Strategic Plan for the City of Buckeye was developed in cooperation with MAG to identify strategies for the City to manage an efficient transportation system. The vision of the ITS Strategic Plan (Plan) is:

> *"To optimize the capacity of the transportation system, improve safety, and reduce peak-hour demand on gateway arterials by facilitating real-time operation and management of the transportation network from the City's operational center and coordinating with neighboring agencies for cross-jurisdictional operations."*

The goal of the Plan is to establish guidance for a comprehensive ITS network that will adequately support buildout conditions. It will accommodate the following:

- high volumes of traffic;
- the need to manage traffic signals;
- the need to manage fiber optic; or
- the introduction of a major traffic generator.

While the current transportation network in Buckeye does not experience significant congestion, the General Plan establishes that the ITS Strategic Plan should be implemented including improvements to infrastructure to ensure a safe and efficient transportation network in the future. As indicated in Chapter 1 of this TMP, Buckeye's population is anticipated to increase by more than 500 percent between 2016 and 2050. The Plan states that increases in traffic resulting from growth warrants the implementation of a City Traffic Management Center (TMC) for the City's ITS program.

Assessment of ITS Needs

Through the ITS Strategic Plan, seven roadways were identified as high priority roads for the ITS due to one or more of the following: crashes at intersections, recurring congestion, delayed emergency response times, truck/freight route, and/or freeway detour route. The following existing roads were identified as high priority roads due to these safety and mobility issues that can be addressed through ITS:

- Apache Road
- Broadway Road
- Miller Road
- Monroe Avenue
- Southern Avenue
- Sun Valley Parkway
- Watson Road
- Yuma Road

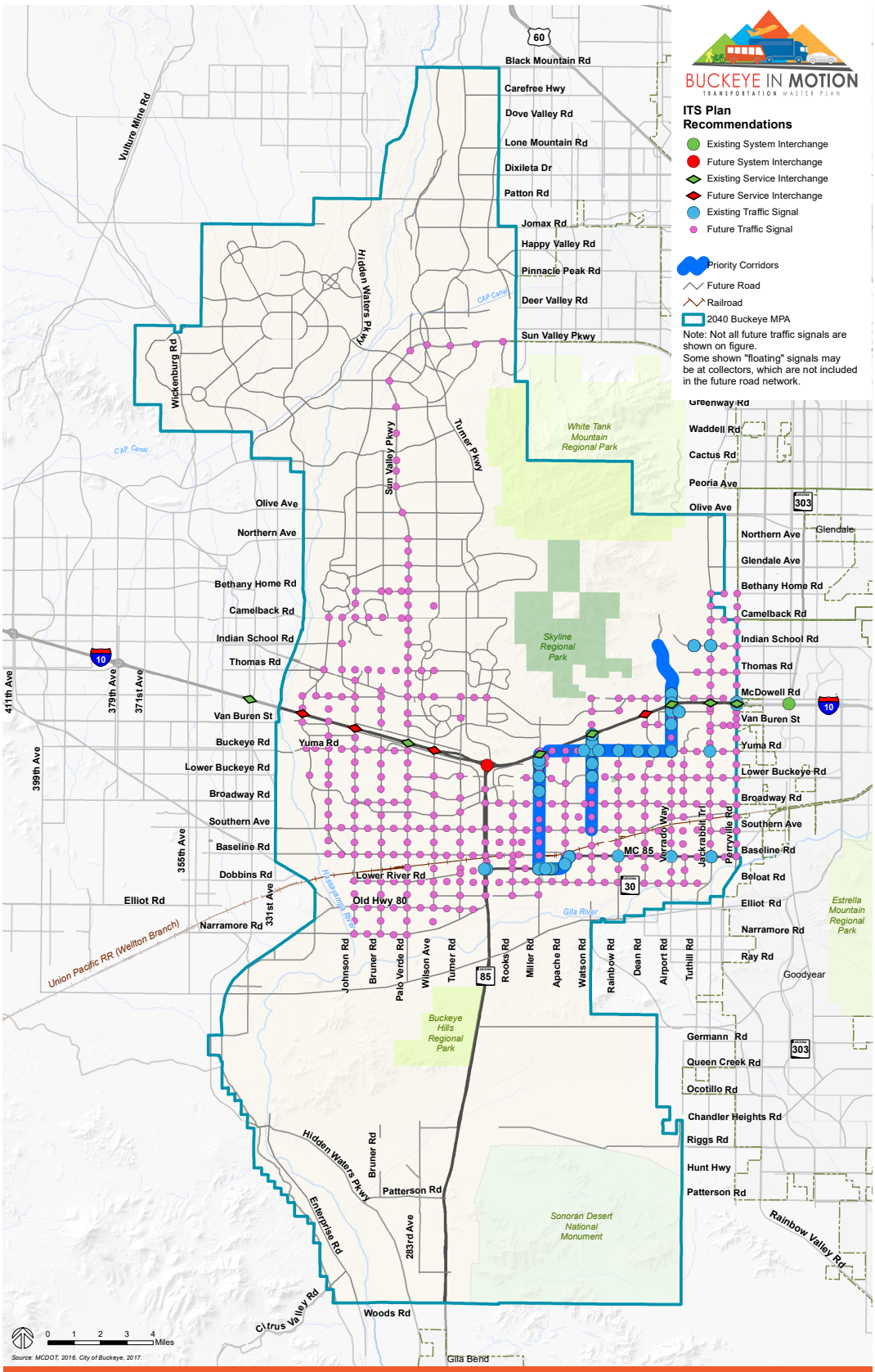
Plan also identifies existing roadways that are not owned by the City, but are high priority due to the significant role they play in the Buckeye transportation network. These are: I-10, SR 85, MC 85, I-11 (future), and SR 30 (future). Coordination with the Arizona Department of Transportation (ADOT) and the Maricopa County Department of Transportation (MCDOT) is necessary in planning for these roadways.

8.6 ITS Recommendations

Recommendations for ITS throughout Buckeye were derived from the 2018 ITS Strategic Plan and planning-level field assessment of existing traffic signals during the Transportation Master Plan (TMP) process. The ITS recommendations are divided into three project types: priority corridors, traffic signals, and ITS devices.

Priority Corridors

The ITS Strategic Plan identifies segments of existing roadways as Priority Corridors. These Priority Corridors are illustrated on Figure 8-2. The recommended segments of roadway for the initial deployment of fiber and additional ITS devices are listed in Table 8-2.



Matrix DESIGN GROUP

Figure 8-2
ITS Plan Recommendations

Table 8-2: ITS Priority Corridors

Corridor	Limits	New Infrastructure Needed						Estimated Cost	Estimated Operation and Maintenance Cost
		Miles of Fiber	Miles of Conduit	Traffic Signal Links	Closed circuit television cameras (CCTV)	Emergency vehicle preemption (EVP)	Detection Equipment		
Watson Road	I-10 to Southern Avenue	3.5	3	4	4	0	16	$777,000	$16,400
Yuma Road	I-10 to Verrado Way	4.5	1	5	5	0	20	$565,000	$20,500
Miller Road	MC85 to I-10	4.25	4.25	5	5	0	20	$1,015,000	$20,5000
Monroe Avenue	Miller Road to Watson Road	1.25	1	6	6	8	24	$612,000	$27,800
Verrado Way	Yuma Road to Indian School Road	4.5	3.5	2	2	0	8	$782,000	$8,200

Source: Buckeye ITS Strategic Plan, 2018.

As recommended in the ITS Strategic Plan, the City should reevaluate and update priority roadways as growth and expansion continues. This may be done by regularly undertaking a prioritization exercise for roadways that coincide with the Buckeye Capital Improvement Program (CIP), General Plan, or TMP updates.

Traffic Signals

According to the ITS Strategic Plan, infrastructure deployment begins with the installation of traffic signals. Through the assessment of the transportation network during the TMP process, it is recommended that traffic signals be established at the intersections shown on Figure 8-2. The proposed locations for traffic signals are generally located at all arterial-arterial or arterial-parkway intersections. Anticipated traffic signals are located on the following roadways listed in Table 8-3. The phasing of these improvements should follow the guidance of the ITS Strategic Plan for Priority Corridors. It is understood that traffic signals may be required at other locations on a case by case basis – high school access, commercial driveway, subdivision access, office complex driveway, etc. – as such, these signals will be connected to the City's ITS network.

Table 8-3: Future Traffic Signal Roadways

Future Traffic Signal Roadways	
North-South Roadways	**East-West Roadways**
315th Avenue	Northern Avenue
Johnson Road	Bethany Home Road
Bruner Road	Camelback Road
Palo Verde Road	Indian School Road
Wilson Avenue	Thomas Road
Turner Road	McDowell Road
SR 85	Van Buren Street
Rooks Road	Yuma Road
Miller Road	Lower Buckeye Road
Apache Road	Broadway Road
Watson Road	Southern Avenue
Rainbow Road	Baseline Road
Dean Road	MC 85
Verrado Way	Lower River Road / Beloat Road
Tuthill Road	Hazen Road
Jackrabbit Trail	Old Highway 80

Source: City of Buckeye, Matrix Design Group, 2018.

ITS Devices

The installation of all traffic signals should include the installation of appropriate ITS devices in conformance with the ITS Strategic Master Plan.

8.7 ITS Implementation and Funding

Local Funding

In order to accommodate the ultimate buildout of the City, ITS improvements will need to be a part of the Buckeye Capital Improvement Program (CIP). The Buckeye CIP is funded through a combination of the City general funds, federal and state funds allocated to the City, grant funds, and impact fees. While the CIP should include ITS improvements, funding for the initial installation of ITS devices will be conducted through private developers.

As noted in the ITS Strategic Plan, the Priority Corridors listed in Section 8.6 are the first priorities for traffic signals and ITS devices. These priority locations should be included in the CIP. Once all priority corridors are completed, additional ITS projects should follow.

Regional Funding

One way that the City can acquire funding for ITS projects is through the MAG Transportation Improvement Program (TIP). The TIP is administered by MAG and identifies specific projects within a five-year schedule with funding sources identified. Through the program, MAG posts a Call for Projects, which are listings of project opportunities for which MAG has funding for. Local agencies may submit applications for such funding during the Call for Projects. Buckeye has placed many projects into the MAG TIP.

State Funding

The Arizona Department of Transportation (ADOT) LPA is a State program that assists local agencies in utilizing federal funds for local government projects as well as oversight for such projects. ITS-related infrastructure is typically eligible for the LPA program. Funding for LPA projects is available through the Federal-Aid Highway Program (FAHP), which reimburses ADOT through the Federal Highway Administration (FHWA). Funds are made available annually at the beginning of the federal fiscal year.

8.8 Summary

The City of Buckeye understands the importance of a reliable and efficient transportation system and the role ITS plays in the transportation network. This chapter incorporated recommendations of the 2018 ITS Strategic Plan for the City of Buckeye including identification of Priority Corridors, future traffic signal locations, supporting ITS devices and infrastructure, and funding opportunities.

Recommendations of this ITS Chapter are incorporated in Chapter 9 (Recommendations and Implementation) of this TMP along with the recommendations of other TMP Plan Elements (Street Plan, Transit Plan, Active Transportation Plan, Aviation Plan, and Rail and Freight Plan).

Please see the next page.

RECOMMENDATIONS & IMPLEMENTATION 9

9.1 Introduction

Provided in this chapter is the summarized recommendations for each Chapter of the Buckeye Transportation Master Plan (TMP): Streets, Transit, Active Transportation, Aviation, Rail, Freight, and ITS. Some recommendations are provided by reference from previous planning studies, notably the Buckeye Transit Plan, the Buckeye Municipal Airport Master Plan, and the ITS Strategic Plan, and ultimately the Bicycle and Pedestrian Master Plan. Other recommendations arise from this TMP planning process. This chapter is divided into the following sections:

- Section 9.1 **Introduction**. An overview of the purpose and intent of the Recommendations and Implementation Chapter including the contents of the chapter.
- Section 9.2 **Implementation Matrix.** A snapshot of all TMP recommended improvements and includes a project name, brief description, implementation timeframe, planning-level cost estimate, and responsible parties.
- Section 9.3 **Timeframes.** An overview of the types of projects that fall within the three implementation planning horizons: short-, mid-, and long-term.

- Section 9.4 **Cost Estimating**. A description of the unit values used in calculating the planning-level cost estimates for each recommendation.
- Section 9.5 **Responsible Parties.** A description of the regional planning partners that are critical to the implementation of projects identified in the Implementation Matrix.
- Section 9.6 **Funding Sources.** Funding sources available to implement recommendations.

9.2 Implementation Matrix

Table 9-1 lists the identified recommendations and provides a project name, brief description, implementation timeframe (short-, mid-, and long-term), planning-level cost estimate, and responsible parties.

Of note, improvements that are identified in the mid-term or long-term planning horizon may be expedited should developments occur more quickly than originally anticipated. An overview of the types of recommendations that were identified in each of the planning horizons is provided in Section 9.3 of this Chapter.

9.3 Timeframes

Short-term Improvements

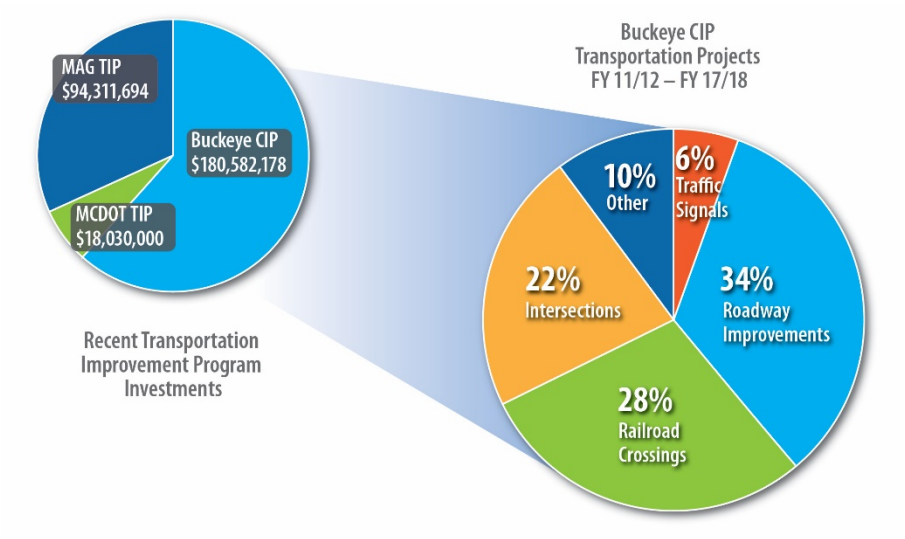
Recommendations for the short-term planning horizon cover Fiscal Year (FY) 2020-2024, the first five years following adoption of the TMP. The recommendations provided include projects identified in the City of Buckeye CIP, projects identified for the next five years in the MAG Regional Transportation Plan, projects identified in the near-term from referenced previous planning documents, projects intended to address spot improvements needed in the current transportation network, and any other project identified by the project team as a short-term critical action item.

Programmed Improvements

Cities, Counties, Departments of Transportation (DOTs), and Metropolitan Planning Organizations (MPOs) all must program future transportation spending in improvement programs. This typically includes projects to be funded over a five-year period via a CIP (Capital Improvement Program), TIP (Transportation Improvement Program), or STIP (State Transportation Improvement Program). A review of the most recent versions of MAG TIP, MCDOT TIP, and City of Buckeye CIP are summarized and provided in **Figure 9-1**. This identifies the total investment in transportation projects in the most recent improvement programs within Buckeye. The projects have been funded and are scheduled for implementation. ADOT STIP is not included as any ADOT project would first be identified in the MAG TIP prior to incorporation in the ADOT STIP.

Not uncommon, the largest amount of investment comes from the City of Buckeye via the CIP. The largest category of investment is roadway improvements, followed by railroad crossing improvements, and interchanges. These programmed improvements have been included in **Short-term Improvements.**

Figure 9-1: Programmed Transportation Improvements in Buckeye MPA



Source: MAG, FY 2018-2022 MAG Transportation Improvement Program (TIP), June 2017. MCDOT, Transportation Improvement Program Fiscal Years 2018-2022, 2017. Town of Buckeye, Capital Improvement Program FY 11/12 – FY 17/18, 2012.

Mid-term Improvements

Recommendations for the mid-term planning horizon cover the years FY 2025-2040. These improvements are currently not programmed but are identified as needed either through the 2040 travel demand model results or through project team and stakeholder discussions.

Long-term Improvements

Recommendations for the long-term planning horizon cover the years 2040-Buildout. These improvements are currently not programmed and are not identified as short-term or mid-term needs either through the 2040 travel demand model results or through project team and stakeholder discussions.

Table 9-1: Implementation Matrix

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Streets				
Short-term				
Apache Road and Southern Avenue Traffic Signal (TS)	Design and construction of the ultimate traffic signal at Apache and Southern. Final design of the ultimate traffic signal, roadway, design or irrigation improvements, overhead electrical relocation, and land purchase. Construct traffic signal and all necessary pavement improvements, (removal and replacement of existing pavement), under grounding irrigation ditches, grading, relocation of overhead utilities, signing and striping.	$5,250,000	City	CIP FY 18/19 – FY 23/24
Apache Road: Lower Buckeye Road to SRP/WAPA powerlines	Widen to four lane arterial by constructing two additional through lanes	$1,350,000	City, MAG	MAG 2035 RTP
Apache Road: Pine Road to Yuma Road	Widen to four lane arterial by constructing two additional through lanes	$2,630,000	City, MAG	MAG 2035 RTP
Apache Road: RID Canal to Lower Buckeye Road	Widen to four lane arterial by constructing two additional through lanes	$1,390,000	City, MAG	MAG 2035 RTP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Apache Road: WAPA power lines to Pine Road	Construct new four-lane arterial roadway	$2,880,000	City, MAG	MAG 2035 RTP
Dean Road: Southern Avenue to 0.5 mi north of RID Canal	Widen to four lane arterial by constructing two additional through lanes	$7,570,000	City, MAG	MAG 2035 RTP
Durango St from Miller Road to Yuma Road	Complete reconstruction and widening of Durango St from Miller Rd to Yuma Rd. Complete reconstruction of the intersection of Yuma Rd and Durango St and intersection improvements. Complete reconstruction of Yuma Rd to the north property line of the Schmitzers. Durango St improvements are approx. 2000 feet long and Yuma Rd improvements are approx. 800 feet long, including curb, gutter, sidewalk, fully reconstructed half street on the property frontage.	$2,500,000	City	CIP FY 18/19 – FY 23/24

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Indian School Road from Jackrabbit Trail to Loop 303	Construct 3.5 miles of major arterial roadway, acquire 3.5 miles of ROW, Construct five ultimate traffic signals, Roadway design, permitting and construction management	$24,720,000	**City**, MCDOT	City Prop 500 List
Indian School Road: 0.20 miles east of Jackrabbit Trail to Perryville Road		$6,440,000	**MCDOT**, City	MCDOT 2035 TSP
Indian School Road: Sunrise Lane to Verrado Way	Widen to four lane arterial by constructing two additional through lanes	$1,630,000	**Developer**, MAG	MAG 2035 RTP
McDowell Road: Dean Road (alignment) to Verrado Way	Widen to four lane roadway by constructing two additional through lanes	$3,110,000	**City**, MAG	MAG 2035 RTP
McDowell Road: Verrado Way to 202nd Avenue	Construct new four lane roadway	$5,050,000	**City**, MAG	MAG 2035 RTP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Miller Road & Maricopa Ultimate Traffic Signal	Traffic signal and intersection improvements – design and construction of the ultimate traffic signal at Miller and Maricopa. Final design, design of irrigation improvements, overhead electrical relocation, and land purchase. Construct all necessary pavement improvements, (removal and replacement of existing pavement), under grounding irrigation ditches, grading, relocation of overhead utilities, signing and striping. Realignment of Alarcon Road.	$4,150,000	City	CIP FY 18/19 – FY 23/24
Miller Road and Watson TI Enhancements	Provide enhancements for the new traffic interchanges at Miller Road and Watson Road. This will be done as part of the ADOT I-10 widening project. The City will be funding the enhancements.	$6,000,000	City	CIP FY 18/19 – FY 23/24

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Miller Road and Baseline Road TS	Design and construct new traffic signal, pavement markings and associated roadway widening.	$3,753,000	City	CIP FY 18/19 – FY 23/24
Miller Road and Broadway Road TS	Design and construct new traffic signal, pavement markings and associated roadway widening.	$3,118,420	City	CIP FY 18/19 – FY 23/24
Miller Road and Southern Road TS	Design and construct new traffic signal, pavement markings and associated roadway widening.	$2,768,420	City	CIP FY 18/19 – FY 23/24
Miller Road - I-10 traffic signal and pavement upgrades	Interim roadway, intersection, and ramp improvements to improve traffic and truck circulation on Miller Road and the interchange.	$4,400,000	ADOT	CIP FY 18/19 – FY 23/24
Miller Road: ADOT ROW line south of I-10 to Narramore Avenue	Widen to four lane roadway by constructing two additional through lanes	$12,050,000	City, MAG	MAG 2035 RTP
Miller Road: Narramore Avenue to Hazen Road	Widen to four lane roadway by constructing two additional through lanes	$3,750,000	City, MAG	MAG 2035 RTP
Perryville Road: McDowell Road to Roosevelt Street	Construct two additional southbound lanes and one additional northbound lane for a total of three southbound and two northbound	$2,230,000	City, MAG	MAG 2035 RTP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Rainbow Road: Durango Street to RID Canal	Widen to four lane arterial by constructing two additional through lanes	$2,980,000	**City**, MAG	MAG 2035 RTP
Rooks Road: Baseline Road to MC-85	Construct new two-lane roadway, intersection, railroad crossing improvements, and canal crossing	$4,780,000	**City**, MAG	MAG 2035 RTP
Southern Avenue: 231st Avenue (alignment) to Watson Road	Widen to six lane arterial by constructing four additional through lanes	$3,830,000	**City**, MAG	MAG 2035 RTP
Southern Avenue: Apache Road to Miller Road	Widen to six lane arterial by constructing four additional through lanes	$7,490,000	**City**, MAG	MAG 2035 RTP
Thomas Road: 199th Avenue to Tuthill Road - Arroyo Seco	Construct new two-lane roadway	$2,330,000	**City**, MAG	MAG 2035 RTP
Thomas Road: Acacia Way to Tuthill Road (alignment)	Construct new two-lane roadway	$960,000	**Developer**, City, MAG	MAG 2035 RTP
Thomas Road: Jackrabbit Trail to 199th Avenue	Construct new two-lane roadway	$2,280,000	**City**, MAG	
Turner Parkway: Baseline Road to 0.5 miles north	Construct two through lanes, for intersection realignment at Baseline Road	$2,250,000	**City**, MAG	MAG 2035 RTP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Verrado Way and Van Buren TS	Intersection improvements. Design and construct new traffic signal, pavement markings and associated roadway widening.	$1,200,000	City	CIP FY 18/19 – FY 23/24
Verrado Way and Yuma Intersection Improvements	Widening of intersection to ultimate layout to include associated drainage improvements.	$2,000,000	City	CIP FY 18/19 – FY 23/24
Warner Street Bridge Approaches	Construction of a full arterial section on the East and West bridge approaches on Warner Street over SR 85. This includes curb, gutter, sidewalk, handrail, jersey barrier, guardrail, embankment re-compaction, embankment stabilization, granite ground cover and drainage improvements.	$2,600,000	City, ADOT	CIP FY 18/19 – FY 23/24
Watson Rd and Broadway Traffic Signal	Construction of ultimate signal improvements	$3,050,000	City	CIP FY 18/19 – FY 23/24

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Watson Road: Durango Street to Lower Buckeye Road	Street improvements - construct two new through lanes northbound from Lower Buckeye to Durango, construct two new through lanes southbound from 880 feet north of Lower Buckeye to Lower Buckeye	$2,230,000	**City**, MAG	MAG 2035 RTP
Watson Road: Extension from Southern to MC 85	Construct new four lane roadway with crossing over Palo Verde Nuclear Generating Station water line, BID Canal and RR Tracks; construct full major arterial six lane section crossings to avoid future expansion	$32,360,000	**City**, MAG	MAG 2035 RTP
Watson Road: Lower Buckeye Road to Broadway	Widen to four lane roadway by constructing two additional through lanes	$9,010,000	**City**, MAG	MAG 2035 RTP
Westpark Loop Road: Rooks Road (South) to Rooks Road (North)	Construct new four lane arterial	$11,840,000	**City**, MAG	MAG 2035 RTP
Yuma Road: Dean Road to 0.15 miles east of Dean Road		Constructed	**MCDOT**, City	MCDOT 2035 TSP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Yuma Road: Tuthill Road to 199th Avenue, south half of the road, (Mountain View South)	Construction of the ultimate half street on the South side of Yuma Road	$3,730,000	City, MAG	MAG 2035 RTP
Mid-term				
287th Avenue from Pinnacle Peak to Dove Valley	Construct new four lane arterial	$49,650,000	City	MAG 2040 Lane Configuration Map
315th Avenue from Glendale to Peoria Avenue/Johnson Road	Construct new four lane arterial	$28,850,000	City	MAG 2040 Lane Configuration Map
315th Avenue from Southern Avenue to Yuma Road	Construct new four lane arterial	$24,050,000	City	MAG 2040 Lane Configuration Map
319th Avenue from Broadway Road to I-10	Construct new six lane major arterial	$23,120,000	City	MAG 2040 Lane Configuration Map
319th Avenue from I-10 to 1/4 mile north of Camelback Road	Construct new four lane arterial	$35,900,000	City	MAG 2040 Lane Configuration Map
323rd Avenue from Wintersburg Parkway, loop around Douglas Ranch development, terminate at Greenway Parkway	Construct new four lane roadway	$105,700,000	City	MAG 2040 Lane Configuration Map
331st Avenue from Broadway Road to Van Buren Street	Construct new two lane roadway	$13,520,000	MCDOT	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Airport Road/Verrado Way from Beloat to Roosevelt Street	Improve to six lane major arterial, including BID, RID and RR crossings	$22,490,000	MCDOT, City	MAG 2040 Lane Configuration Map
Apache Road from Baseline Road to the RID canal	Improve to four lane arterial, including BID, RID and RR crossings	$10,180,000	City	MAG 2040 Lane Configuration Map
Apache Road from Beloat Road to MC-85	Construct new four lane arterial	$7,680,000	City	MAG 2040 Lane Configuration Map
Baseline Road from Apache Road to 315th Avenue	Improve to four lane arterial, including BID and RR crossings	$25,000,000	MCDOT, City	MAG 2040 Lane Configuration Map
Beardsley Parkway from Desert Oasis Boulevard to Johnson Road	Construct new four lane arterial	$27,580,000	City	MAG 2040 Lane Configuration Map
Bell Rd from Hidden Waters Parkway to Turner Parkway	Construct new six lane major arterial	$44,260,000	City	MAG 2040 Lane Configuration Map
Beloat Road: 0.25 miles east of Apache Road to Watson Road		$2,270,000	MCDOT, City	MCDOT 2035 TSP
Beloat Road: Rainbow Road to Dean Road		$3,010,000	MCDOT, City	MCDOT 2035 TSP
Beloat Road: Tuthill Road/Jackrabbit Trail to Verrado Way		$4,180,000	MCDOT, City	MCDOT 2035 TSP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Broadway Road from 223rd Avenue to Miller Road	Improve to six lane major arterial	$21,030,000	City	MAG 2040 Lane Configuration Map
Broadway Road from Dean Road to 223rd Avenue	Improve to four lane arterial	$1,520,000	City	MAG 2040 Lane Configuration Map
Broadway Road from Johnson Road to 319th Avenue	Improve to six lane major arterial	$13,600,000	City	MAG 2040 Lane Configuration Map
Broadway Road from Perryville Road to Jackrabbit Trail	Improve to six lane major arterial	$6,100,000	MCDOT, City	MAG 2040 Lane Configuration Map
Bruner Road from Old US-80 to Wintersburg Parkway	Improve to four lane arterial, including BID, RID and RR crossings	$54,120,000	City	MAG 2040 Lane Configuration Map
Camelback Road from 1/2 mi east of Sun Valley Parkway to 339th Avenue	Construct new six lane major arterial, including bridge at Hassayampa River	$76,620,000	City	MAG 2040 Lane Configuration Map
Camelback Road from Perryville Road to Tuthill Road	Improve to four lane arterial	$6,070,000	MCDOT, City	MAG 2040 Lane Configuration Map
Canyon Springs Boulevard from Hayden-Rhodes Viaduct to Cloud Road	Construct new four lane arterial	$71,290,000	City	MAG 2040 Lane Configuration Map
Dean Road from Beloat Road to Southern Avenue	Improve to four lane arterial, including BID and RR crossings	$6,060,000	City	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Dean Road Traffic Interchange at I-10	Construct new six lane roadway, Construct grade separated interchange on I-10, Construct the ultimate signals at two intersections, ROW acquisitions for the above improvements, roadway design, permitting and construction management	DNE	ADOT	City Prop 500 List
Dove Valley Road from Canyon Springs Boulevard to Hidden Waters Parkway	Construct new six lane major arterial	$25,730,000	City	MAG 2040 Lane Configuration Map
Glendale Avenue from Perryville Road to Jackrabbit Trail	Construct new four lane arterial	$9,990,000	City	MAG 2040 Lane Configuration Map
Glendale Avenue from Sun Valley Parkway to 310th Avenue alignment	Construct new four lane arterial	$19,100,000	City	MAG 2040 Lane Configuration Map
Greenway Parkway from Turner Parkway to Sun Valley Parkway	Construct new six lane parkway, including bridge at Hassayampa River	$52,600,000	City	MAG 2040 Lane Configuration Map
Hazen Road: SR-85 to Miller Road		$6,070,000	MCDOT	MCDOT 2035 TSP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Hidden Waters Parkway from Greenway Parkway to Bell Road	Construct new six lane parkway	$18,620,000	City	MAG 2040 Lane Configuration Map
Indian School Road from 195th Avenue to Sunrise Lane	Improve to four lane arterial	$4,690,000	City	MAG 2040 Lane Configuration Map
Indian School Road from Tartesso Parkway to 319th Avenue	Construct new four lane arterial	$36,800,000	City	MAG 2040 Lane Configuration Map
Jackrabbit Trail from MC-85 to Durango Street	Improve to six lane major arterial, including BID and RR crossings	$21,030,000	MCDOT	MAG 2040 Lane Configuration Map
Jackrabbit Trail from McDowell Road to Olive Avenue	Improve to six lane major arterial	$42,320,000	MCDOT	MAG 2040 Lane Configuration Map
Jackrabbit Trail from Yuma Road to Van Buren Street	Improve to six lane major arterial	$6,000,000	MCDOT	MAG 2040 Lane Configuration Map
Johnson Road from 315th Avenue/Peoria Avenue to Greenway Parkway	Construct new four lane arterial	$25,040,000	MCDOT	MAG 2040 Lane Configuration Map
Johnson Road from Old US-80 to I-10	Improve to six lane major arterial, including BID, RID and RR crossings	$42,470,000	MCDOT	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Johnson Road Traffic Interchange at I-10	Construction of a multi lane grade separated traffic interchange, Roadway design, permitting and construction management	DNE	ADOT	City Prop 500 List
Lower Buckeye Road from Dean Road to RID canal	Construct new four lane arterial, including RID crossing	$3,700,000	MCDOT	MAG 2040 Lane Configuration Map
Lower Buckeye Road from the RID canal to Watson Road	Improve to four lane arterial	$5,000,000	City	MAG 2040 Lane Configuration Map
Lower Buckeye Road from Wilson Road to Palo Verde	Construct new four lane arterial	$7,970,000	City	MAG 2040 Lane Configuration Map
MC-85 from Southern Avenue to Watson Road	Improve to six lane roadway (expressway as designated on MAG 2040 Facility Type Map)	$40,720,000	MCDOT	MAG 2040 Lane Configuration Map
MC-85 from SR-85 to Turner Parkway	Improve to four lane arterial	$2,930,000	MCDOT	MAG 2040 Lane Configuration Map
MC-85 from Watson Road to Miller Road	Improve to four lane roadway (expressway as designated on MAG 2040 Facility Type Map)	$6,810,000	City	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
McDowell Parkway from Loop 303 to Sun Valley Parkway	Construct 13 miles of four lanes parkway, 13 miles of ROW acquisition, Roadway design, permitting and construction management	$143,000,000	City	City Prop 500 List
McDowell Parkway from Sun Valley Parkway to the MPA Boundary	Construct new six lane parkway	$56,110,000	City	MAG 2040 Lane Configuration Map
McDowell Road from 202nd Avenue to Verrado Way	Construct new four lane arterial	$5,030,000	MCDOT	MAG 2040 Lane Configuration Map
Narramore Road from Rainbow Valley Road to Airport Road/Verrado Way	Improve to four lane arterial	$6,000,000	MCDOT	MAG 2040 Lane Configuration Map
Northern Avenue from Perryville to Jackrabbit Trail	Construct new four lane arterial	$9,900,000	City	MAG 2040 Lane Configuration Map
Northern Avenue from Turner Parkway to Hidden Waters Parkway	Construct new six lane parkway, including bridge at Hassayampa River	$104,420,000	City	MAG 2040 Lane Configuration Map
OLD US-80 from SR-85 to Salome Hwy	Improve to four lane arterial	$17,520,000	MCDOT	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Olive Avenue from 183rd Avenue (Cortessa Parkway) to White Tank Mountain Road	Improve to four lane arterial	$7,430,000	City	MAG 2040 Lane Configuration Map
Olive Avenue from Turner Parkway to Hidden Waters Parkway	Construct new four lane arterial, including bridge at Hassayampa River	$60,070,000	City	MAG 2040 Lane Configuration Map
Palo Verde Road from Old US-80 to I-10	Improve to six lane parkway	$46,960,000	MCDOT	MAG 2040 Lane Configuration Map
Patton Road from 253rd Avenue to Hidden Waters Parkway	Construct new two lane roadway	$21,640,000	MCDOT	MAG 2040 Lane Configuration Map
Perryville Road from MC-85 to Roosevelt St	Improve to six lane major arterial	$32,990,000	MCDOT	MAG 2040 Lane Configuration Map
Perryville Road from McDowell Road to Camelback Road	Improve to six lane major arterial	$17,830,000	City	MAG 2040 Lane Configuration Map
Perryville Road from Orangewood Avenue to Mountain View Avenue	Improve to six lane major arterial	$11,940,000	MCDOT	MAG 2040 Lane Configuration Map
Pinnacle Peak Road from 259th Avenue (alignment) to 287th Avenue	Construct new six lane roadway	$42,710,000	City, MAG	MAG 2035 RTP
Rainbow Road from Beloat Road to the RID canal	Improve to four lane arterial	$11,520,000	City	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Rooks Road from Baseline to Broadway Road	Improve to four lane arterial	$5,870,000	City	MAG 2040 Lane Configuration Map
Rooks Road from Beloat Road to MC-85	Improve to four lane arterial	$2,990,000	City	MAG 2040 Lane Configuration Map
Salome Hwy from Old US-80 to 339th Avenue	Improve to four lane arterial	$12,230,000	MCDOT	MAG 2040 Lane Configuration Map
Southern Ave from Johnson to 319th Avenue	Improve to six lane major arterial	$7,740,000	MCDOT	MAG 2040 Lane Configuration Map
Southern Ave from SR-85 to Johnson Road	Improve to four lane arterial	$14,690,000	MCDOT	MAG 2040 Lane Configuration Map
Southern Avenue SR 85 to Loop 303	Reconstruction of existing two lanes, Construction of up to two travel lanes eastbound and two travel lanes westbound, Elevated Bridges over the UPRR and the BWCDD, Bridge widening at the RID canal, construct five ultimate traffic signals, Relocation of all RID and BID irrigation facilities adjacent to Southern Ave and at the intersections, ROW acquisitions for the above improvements, roadway design, permitting and construction management	$90,440,000	City	City Prop 500 List

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Tartesso Parkway from Bruner Road to Indian School Road	Construct new four lane arterial	$16,530,000	City	MAG 2040 Lane Configuration Map
Thomas Road between Perryville Road and Jackrabbit Trail	Construct new four lane arterial	$7,960,000	MCDOT	MAG 2040 Lane Configuration Map
Thomas Road from 1/2 mile east of Sun Valley Parkway to Sun Valley Parkway	Construct new four lane arterial	$12,240,000	City	MAG 2040 Lane Configuration Map
Thomas Road from Sun Valley Parkway to Bruner Road	Improve to six lane major arterial	$3,220,000	City	MAG 2040 Lane Configuration Map
Turner Parkway from Desert Oasis Boulevard to Cloud Road	Construct new six lane major arterial	$10,940,000	MCDOT	MAG 2040 Lane Configuration Map
Turner Parkway from I-10 to Desert Oasis Boulevard	Construct new six lane major arterial	$169,570,000	City	MAG 2040 Lane Configuration Map
Turner Road from Old US-80 to 1/2 mile south of Hazen Road	Improve to four lane arterial	$810,000	City	MAG 2040 Lane Configuration Map
Van Buren Street from 183rd Avenue to Jackrabbit Trail	Improve to four lane arterial	$3,000,000	MCDOT	MAG 2040 Lane Configuration Map
Van Buren Street from 331st Avenue to 339th Avenue	Construct new two lane roadway	$4,520,000	MCDOT	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Watson Road from Beloat to MC-85	Improve to four lane arterial	$2,990,000	City	MAG 2040 Lane Configuration Map
Wickenburg Road from Waddell Road alignment to Beardsley Road alignment	Improve to four lane arterial	$13,560,000	MCDOT	MAG 2040 Lane Configuration Map
Wilson Avenue from Old US-80 to Southern Avenue	Improve to four lane arterial	$9,060,000	City	MAG 2040 Lane Configuration Map
Wintersburg Parkway from Turner Parkway to Hidden Waters Parkway	Construct new six lane parkway, including bridge at Hassayampa River	$110,300,000	City, MCDOT	MAG 2040 Lane Configuration Map
Yuma Road from 1/4 mi east of Palo Verde Road to Johnson Road	Improve to four lane arterial	$7,330,000	City	MAG 2040 Lane Configuration Map
Yuma Road from 239th Avenue to 247th Avenue	Improve to six lane major arterial	$6,410,000	City, MCDOT	MAG 2040 Lane Configuration Map
Yuma Road from Broadway Road to Lower Buckeye Road	Improve to four lane arterial along W Connector Road, including RID canal crossing	$4,030,000	City	MAG 2040 Lane Configuration Map
Yuma Road from Johnson Road to 319th Avenue	Construct new six lane major arterial	$18,910,000	City	MAG 2040 Lane Configuration Map
Yuma Road from Perryville Road to Jackrabbit Trail	Improve to six lane major arterial	$9,050,000	MCDOT	MAG 2040 Lane Configuration Map
Yuma Road from Tuthill Road to Dean Road	Improve to six lane major arterial	$8,790,000	MCDOT	MAG 2040 Lane Configuration Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Yuma Road from W Connector Road/Lower Buckeye to 1/4 mi east of Palo Verde Road	Construct new four lane arterial	$22,630,000	City	MAG 2040 Lane Configuration Map
Long-term				
283rd Avenue from Woods Road to I-11	Construct new six lane major arterial	$75,780,000	City	Buildout Network Map
287th Avenue from Dove Valley to Cloud Road	Construct new six lane major arterial	$23,000,000	City	Buildout Network Map
287th Avenue from Pinnacle Peak to Dove Valley	Improve to six lane major arterial	$18,620,000	City	Buildout Network Map
315th Avenue curve between Baseline Road/309th Avenue and Southern Avenue/315th Avenue	Construct new six lane major arterial	$13,480,000	City	Buildout Network Map
315th Avenue from Yuma Parkway north to Van Buren Street, then west along Van Buren Street (alignment) to 319th Avenue	Construct new four lane arterial	$18,150,000	City	Buildout Network Map
319th Avenue between Southern Avenue and Broadway Road	Construct new four lane arterial	$12,690,000	City	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
323rd Avenue from Northern Parkway to Wintersburg Parkway	Construct new six lane major arterial	$32,940,000	City	Buildout Network Map
Beardsley Road from 323rd Avenue Loop east to Douglas Ranch Loop	Construct new six lane major arterial	$9,900,000	City	Buildout Network Map
Beardsley Road from Douglas Ranch Loop to Wickenburg Road	Construct new six lane major arterial	$27,630,000	City	Buildout Network Map
Bethany Home Road from Johnson to Bethany Home Road -Glendale loop	Construct new six lane major arterial	$50,950,000	City	Buildout Network Map
Bethany Home-Glendale Loop between Bethany Home Road and Glendale	Construct new six lane major arterial loop	$64,570,000	City	Buildout Network Map
Broadway Road from 231st Avenue to Apache Road	Improve to six lane major arterial	$4,510,000	City	Buildout Network Map
Bruner Road from Narramore Road to SR-30	Construct new six lane major arterial	$11,020,000	MCDOT	Buildout Network Map
Bruner Road from Old US-80 to Wintersburg Parkway	Improve to six lane major arterial	$51,120,000	MCDOT	Buildout Network Map
Bruner Road from Patterson Road to I-11	Construct new six lane major arterial	$29,640,000	MCDOT	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Camelback Road from 263rd Avenue (alignment) to Sun Valley Parkway	Construct new six lane major arterial	$38,170,000	City	Buildout Network Map
Canyon Springs Boulevard at Sun Valley Parkway	Construct six lane loop at Sun Valley Parkway	$54,870,000	City	Buildout Network Map
Canyon Springs Boulevard from Sun Valley Parkway to Cloud Road	Improve to six lane major arterial	$26,740,000	City	Buildout Network Map
Carefree Highway from 253rd Avenue to Turner Parkway	Construct new four lane arterial	$17,040,000	City	Buildout Network Map
Citrus Valley Road from Enterprise Parkway to MPA boundary	Construct new six lane major arterial	$23,230,000	City	Buildout Network Map
Cloud Road from 267th Avenue (alignment) to 291st Avenue (alignment)	Construct new six lane major arterial	$34,370,000	City	Buildout Network Map
Dean Road TI at I-10	Construct new partial cloverleaf traffic interchange	DNE	ADOT	Buildout Network Map
Desert Creek Traffic Interchange at I-10	Construction of a multi lane grade separated traffic interchange, Roadway design, permitting and construction management	DNE	ADOT	City Prop 500 List

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Dixileta Drive from 253rd Avenue to 287th Avenue	Construct new six lane major arterial	$25,890,000	City	Buildout Network Map
Durango Road from 257th Avenue to 263rd Avenue	Construct new four lane arterial	$7,360,000	City	Buildout Network Map
Durango Road from Miller Road to 257th Avenue	Improve to four lane arterial	$2,510,000	City	Buildout Network Map
Elliot Road from Airport Road (Verrado) to I-11	Construct new six lane major arterial	$107,480,000	MCDOT	Buildout Network Map
Enterprise Road from I-11 to southernmost MPA boundary	Construct new six lane major arterial	$120,300,000	City	Buildout Network Map
Glendale Avenue from Sun Valley Parkway to Bethany Home Road-Glendale loop	Construct new six lane major arterial	$21,320,000	City	Buildout Network Map
Greenway Parkway from Sun Valley Parkway to Hidden Waters Parkway	Construct new six lane parkway	$42,610,000	City	Buildout Network Map
Hidden Waters Parkway along 351st Avenue alignment adjacent to Old US-80	Construct new six lane parkway	$44,750,000	City	Buildout Network Map
Hidden Waters Parkway from Bell Road to White Tanks Freeway	Construct new six lane parkway, including bridge at Hassayampa River	$121,820,000	City	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Hidden Waters Parkway from Wintersburg Parkway to Greenway Parkway	Construct new six lane parkway	$30,140,000	City	Buildout Network Map
Hidden Waters Parkway from Woods Road to SR-30	Construct new six lane parkway along Old US-80	$116,940,000	MCDOT	Buildout Network Map
Indian School Road from Jackrabbit to Verrado Way	Improve to six lane major arterial	$6,310,000	City	Buildout Network Map
Indian School Road from Johnson to Hidden Waters Parkway	Construct new six lane major arterial	$11,690,000	City	Buildout Network Map
Jackrabbit Road TI at I-10	Construct new DDI traffic interchange	DNE	ADOT	Buildout Network Map
Johnson Road from McDowell Road to Peoria Avenue	Improve to six lane major arterial	$24,960,000	City	Buildout Network Map
Johnson Road from Narramore Road to SR-30	Construct new six lane major arterial	$10,780,000	MCDOT	Buildout Network Map
Jomax Road from Canyon Springs Boulevard to 287th Avenue	Improve to six lane major arterial	$7,960,000	City	Buildout Network Map
Jomax Road from White Tanks Freeway to I-11	Construct new six lane major arterial	$52,900,000	MCDOT	Buildout Network Map
Lone Mountain Road from Canyon Springs Boulevard to 287th Avenue	Construct new six lane major arterial	$23,430,000	City	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Lower Buckeye Road from Turner Parkway to Wilson Avenue	Construct new four lane arterial	$8,540,000	City	Buildout Network Map
Lower Buckeye Road from Watson to 255th Avenue	Improve to four lane arterial	$8,110,000	City	Buildout Network Map
MC-85 from Miller Road to SR-85	Improve to six lane major arterial	$6,040,000	MCDOT	Buildout Network Map
MC-85 from Turner Parkway to Johnson Road	Improve to six lane major arterial	$12,160,000	MCDOT	Buildout Network Map
McDowell Parkway from Dean to Turner Parkway	Improve to eight lane parkway	$21,750,000	City	Buildout Network Map
McDowell Road from Bruner Road to 319th Avenue	Construct new four lane arterial	$18,920,000	City	Buildout Network Map
McDowell Road from McDowell Parkway to Watson Road	Improve to six lane major arterial	$5,280,000	City	Buildout Network Map
Miller Road from Elliot Road to SR-30	Construct new six lane major arterial	$16,860,000	MCDOT	Buildout Network Map
Narramore Road from Palo Verde Road to Old US-80	Improve to six lane major arterial	$12,270,000	MCDOT	Buildout Network Map
Narramore Road from SR-30, curve west to Palo Verde Road	Construct new six lane major arterial along Turner alignment	$22,960,000	MCDOT	Buildout Network Map
Old US-80 from SR-85 to I-11	Construct new SR-30 freeway	DNE	ADOT	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Olive Avenue from Turner Parkway to Hidden Waters Parkway	Improve to six lane major arterial	$15,710,000	City	Buildout Network Map
Palo Verde Road from Elliot Road to SR-30	Construct new six lane major arterial	$30,310,000	MCDOT	Buildout Network Map
Patterson Road from Bruner Road to Hidden Waters Parkway	Improve to four lane arterial	$1,850,000	MCDOT	Buildout Network Map
Patterson Road from SR-85 to Bruner Road	Improve to six lane major arterial	$7,210,000	City	Buildout Network Map
Patton Road from 253rd Avenue to Hidden Waters Parkway	Construct new six lane major arterial	$52,900,000	MCDOT	Buildout Network Map
Pecos Road (Alignment) from SR-303 to SR-85	Construct new six lane major arterial	$79,170,000	MCDOT	Buildout Network Map
Peoria Avenue from Turner Parkway to Johnson Road /315th Avenue	Construct new four lane arterial	$35,920,000	City	Buildout Network Map
Rainbow Road from Elliot Road to SR-30	Construct new six lane major arterial	$15,110,000	MCDOT	Buildout Network Map
Roosevelt Street from Jackrabbit to 211th Avenue	Construct new four lane arterial	$15,850,000	City	Buildout Network Map
Southern Avenue from SR-85 to I-11	Improve to six lane parkway	$30,980,000	MCDOT	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Sun Valley Parkway from I-10 to Loop 303	Conversion of the existing arterial road section to a functioning regional parkway, ROW Acquisition for the parkway conversion, roadway design, permitting and construction management	$142,560,000	MCDOT	City Prop 500 List
Sun Valley Parkway from Broadway Road to Olive Avenue	Improve to eight lane parkway	$66,210,000	MCDOT	Buildout Network Map
Sun Valley Parkway from MPA boundary to 271st Avenue	Improve to eight lane parkway	$9,140,000	MCDOT	Buildout Network Map
Tartesso Parkway	Construct new six lane major arterial and improve existing to six lane major arterial throughout Tartesso development	$76,050,000	City	Buildout Network Map
Thomas Road from Bruner Road to McDowell Parkway	Construct new four lane arterial and improve existing to four lane arterial	$9,600,000	MCDOT	Buildout Network Map
Thomas Road from McDowell Parkway to Hidden Waters Parkway	Construct new six lane major arterial	$13,840,000	MCDOT	Buildout Network Map
Thomas Road from Turner Parkway to Sun Valley Parkway	Construct new six lane major arterial	$18,550,000	City	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Turner Parkway from I-10 to intersection of SR 30	Construct two through lanes, ROW Acquisition for Turner Parkway, Roadway design, permitting and construction management	DNE	City	City Prop 500 List
Turner Parkway from 271st Avenue to Pinnacle Peak Road	Improve to eight lane parkway	$18,190,000	City	Buildout Network Map
Turner Parkway from I-10 to Bethany Home Road	Improve to eight lane parkway	$42,050,000	City	Buildout Network Map
Turner Parkway from Jomax Road to Lone Mountain Road	Improve to eight lane parkway	$18,190,000	MCDOT	Buildout Network Map
Turner Road from Narramore Road to SR-30	Construct new six lane major arterial	$4,440,000	City	Buildout Network Map
Van Buren Street from Airport Road (Verrado) to Dean Road	Construct new four lane arterial	$8,090,000	City	Buildout Network Map
Van Buren Street from Turner Parkway to Sun Valley Parkway	Construct new six lane major arterial	$27,780,000	City	Buildout Network Map
Watson Road from Elliot Road to SR-30	Construct new six lane major arterial	$15,420,000	City	Buildout Network Map
Watson Road from McDowell Parkway to McDowell Road	Improve to six lane major arterial	$4,720,000	City	Buildout Network Map

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Watson Road TI at I-10	Construct new traffic interchange; evaluation of SPUI or DDI is needed	DNE	ADOT	Buildout Network Map
White Tanks Freeway from 251st Avenue to system interchange at I-11	Construct new six lane freeway	DNE	ADOT	Buildout Network Map
Wilson Avenue from Broadway Road to Bell Road	Improve to six lane major arterial	$42,620,000	City	Buildout Network Map
Wilson Avenue from Narramore Road to SR-30	Construct new six lane major arterial	$8,710,000	MCDOT	Buildout Network Map
Woods Road from SR-85 to Johnson Road	Construct new six lane major arterial	$36,260,000	MCDOT	Buildout Network Map
Yuma Road from 319th Avenue to 331st Avenue	Construct new six lane parkway	$16,120,000	City	Buildout Network Map
Yuma Road from 339th Avenue to I-11	Construct new six lane parkway	$32,440,000	City	Buildout Network Map
Yuma Road from Palo Verde to I-11	Improve to six lane parkway (outside of new construction previously listed)	$15,490,000	City	Buildout Network Map
Transit				
Mid-term				
Fixed Route Bus Service	Provide Fixed Route Bus Service on all arterials	-	Valley Metro	TMP
Rapid Bus Transit Route	Future White Tanks Freeway	$6.30 / revenue mile for O&M	Valley Metro	TMP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Rapid Bus Transit Route	Future I-11 Freeway	$6.30 / revenue mile for O&M	Valley Metro	TMP
Rapid Bus Transit Route	I-10 Freeway	$6.30 / revenue mile for O&M	Valley Metro	TMP
Rapid Bus Transit Route	McDowell Parkway (with 1.5-mile connection on 319th Avenue)	$6.30 / revenue mile for O&M	Valley Metro	TMP
Rapid Bus Transit Route	SR 85 (connecting through Downtown Buckeye, terminating at Jackrabbit Trail park-n-ride)	$6.30 / revenue mile for O&M	City	TMP
Park-N-Ride and Transit Center	I-10 and Palo Verde Road	DNE	City	TMP
Park-N-Ride and Transit Center	Miller Road and MC 85	DNE	City	TMP
Transit Center	Turney Parkway and Patton Road	DNE	City	TMP
Transit Center	Turner Parkway and Peoria Avenue	DNE	City	TMP
Transit Center	Van Buren Street and Verrado Way	DNE	City	TMP
Transit Center	Bruner Road and Riggs Road	DNE	City	TMP
Park-n-Ride	Future I-11 at Douglas Ranch	DNE	City	TMP
Park-n-Ride	Sun Valley Parkway and Turney Parkway	DNE	City	TMP
Park-n-Ride	Sun Valley Parkway and Northern Avenue	DNE	City	TMP
Park-n-Ride	I-10 and 319th Avenue	DNE	City	TMP
Park-n-Ride	I-10 and Miller Road	DNE	City	TMP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Park-n-Ride	SR 85 and Patterson Road	DNE	City	TMP
Active Transportation				
Short-term				
Rainbow Road: Durango Street to Lower Buckeye Road; Lower Buckeye Road: Rainbow Road to Watson Road; Watson Road to Durango Street	Design multiuse path	DNE	City, MAG	MAG 2035 RTP
Rainbow Road: Durango Street to Lower Buckeye Road; Lower Buckeye Road: Rainbow Road to Watson Road; Watson Road to Durango Street	Construct multiuse path	DNE	City, MAG	MAG 2035 RTP
Aviation				
Short-term				
Airport capital improvement	North Land Acquisition (74 Acres) -Phase 1	$4,075,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	North Land Acquisition (74 Acres) - Phase II	$4,075,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design T-Hangar Construction	$75,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design Automobile Parking and Access - Phase I	$135,000	City	Buckeye Municipal Airport Master Plan 2007

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Airport capital improvement	North Land Acquisition (74 Acres) - Phase III	$4,075,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct 30 T-Hangars	$805,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct Automobile Parking and Access - Phase I	$627,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design Aircraft Wash Rack	$38,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design North Access Road	$103,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design Helipad and Hardstands	$55,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Design Northeast Access Road	$105,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	North Land Acquisition (74 Acres) - Phase IV	$4,075,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct Aircraft Wash Rack	$250,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct North Access Road	$683,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct Helipad and Two Hardstands	$367,000	City	Buckeye Municipal Airport Master Plan 2007
Airport capital improvement	Construct Northeast Access Road	$855,000	City	Buckeye Municipal Airport Master Plan 2007

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Mid-term				
Water system	Design and construction for proposed domestic water system and fire protection system infrastructure.	$6.5 million	City	Buckeye Municipal Airport Drainage and Utilities Study
Sewer system	design and construct a complete sanitary wastewater sewer system infrastructure in three independent sewer improvement sections.	$2.8 million	City	Buckeye Municipal Airport Drainage and Utilities Study
Electrical	Utilize primary power on Palo Verde Road as underground service. Convert the existing overhead secondary power on the airport to buried duct banks and convert 1,000 feet of existing power poles along Yuma Road to buried service.	DNE	City	Buckeye Municipal Airport Drainage and Utilities Study
Communications	shared trench electrical and telephone services on property and cable service followed by conduit for voice and data transmission infrastructure.	$1.9 million	City	Buckeye Municipal Airport Drainage and Utilities Study

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Natural Gas System	While Southwest Gas has indicated that it is unlikely that natural gas facilities will be available on Palo Verde Road, the City of Buckeye has identified possible infrastructure that could service facilities at the airport.	$700,000	City	Buckeye Municipal Airport Drainage and Utilities Study
Utility Corridors	Utility corridors are recommended to be identified for future water, sewer, electric, ITS, telecommunications, and gas utilities. Drainage is not to be placed in such corridors.	There is no specified cost detailed for these improvements	City	Buckeye Municipal Airport Drainage and Utilities Study
Drainage	Six tributary drainage sub-areas with drainage features that are grouped into four systems: off-site drainage system, on-site infield retention system, on-site storm drain system, on-site graded system with swales.	$4.2 million	City	Buckeye Municipal Airport Drainage and Utilities Study
Long-term				
Commuter Rail – Estrella / San Tan Lune Corridor	Support the initial Commuter Rail Service from Baseline Road to Miller Road on Wellton Branch	$1.16 billion ($16.2 million/mile)	Multiple Agencies	MAG 2018 Commuter Rail Study

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Logistics Center Implementation	Implement a future logistics center at the Buckeye Yard if deemed necessary by UPRR.	There is no specified cost detailed for this	**UPRR,** City	ADOT State Rail Plan
Rail				
Long-term				
Commuter Rail – Estrella / San Tan Lune Corridor	Support the initial Commuter Rail Service from Baseline Road to Miller Road on Wellton Branch	$1.16 billion ($16.2 million/mile)	**Multiple Agencies**	MAG 2018 Commuter Rail Study
Logistics Center Implementation	Implement a future logistics center at the Buckeye Yard if deemed necessary by UPRR.	There is no specified cost detailed for this	**UPRR,** City	ADOT State Rail Plan
Freight				
Short-term				
Baseline Road truck route	Miller Road to 319th Avenue	DNE	**City**	TMP
Broadway Road truck route	Palo Verde Road to Johnson Road	DNE	**City**	TMP
Broadway Road truck route	Perryville Road to SR 85	DNE	**City**	TMP
Camelback Road truck route	Turner Parkway to 319th Avenue	DNE	**City**	TMP
Dove Valley Road truck route	MPA Boundary to MPA Boundary	DNE	**City**	TMP
Future Greenway Parkway truck route	Turner Parkway to Future I-11	DNE	**City**	TMP
Future Hidden Waters Parkway truck route	MPA Boundary to Woods Road	DNE	**City**	TMP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Future Hidden Waters Parkway truck route	MPA Boundary to MPA Boundary	DNE	City	TMP
Future Hidden Waters Parkway truck route	339th Avenue to Patton Road	DNE	City	TMP
Future I-11 truck route	Dove Valley Road to Riggs Road	DNE	NHFN	TMP
Future SR 30 truck route	Perryville Road to Future I-11	DNE	NHFN	TMP
Future White Tanks Freeway truck route	Future I-11 to MPA Boundary	DNE	NHFN	TMP
I-10 truck route	Perryville Road to 331st Avenue	DNE	NHFN	TMP
Jackrabbit Trail truck route	McDowell Road to Baseline Road	DNE	MCDOT	TMP
Johnson Road truck route	I-10 to Broadway Road	DNE	City	TMP
MC 85 truck route	Perryville Road to Palo Verde Road	DNE	City	TMP
McDowell Road truck route	Perryville Road to 319th Avenue	DNE	City	TMP
Miller Road truck route	I-10 to Future SR 30	DNE	City	TMP
Northern Avenue truck route	Turner Parkway to 319th Avenue	DNE	City	TMP
Palo Verde Road truck route	I-10 to Narramore Road	DNE	City	TMP
Rainbow Road truck route	Broadway Road to Southern Avenue	DNE	City	TMP
Southern Avenue truck route	Palo Verde Road to 331st Avenue	DNE	City	TMP
Southern Avenue truck route	Perryville Road to SR 85	DNE	City	TMP

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
SR 85 truck route	I-10 to Woods Road	DNE	NHFN	TMP
Sun Valley Parkway truck route	251st Avenue to I-10	DNE	City	TMP
Turner Parkway truck route	Black Mountain Road to I-10	DNE	City	TMP
Watson Road truck route	I-10 to Future SR 30	DNE	City	TMP
Wintersburg Parkway truck route	Turner Parkway to 339th Avenue	DNE	City	TMP
Yuma Road truck route	Palo Verde Road to 331st Avenue	DNE	City	TMP
ITS				
Short-term				
Watson Road and Broadway Road Traffic Signal	Construction of ultimate signal improvements	$3,050,000	City	CIP FY 18/19 – FY 23/24
ITS Miller from I-10 to RID Canal	Install two miles of conduit, pull boxes and fiber optics to interconnect traffic. Allows signal optimization and congestion relied in commercial corridor of Miller Road, south of I-10	$1,320,000	City	CIP FY 18/19 – FY 23/24

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Watson Road from I-10 to Southern Avenue	Miles of Fiber: 3.5 Miles of Conduit: 3 Traffic Signal Links: 4 CCTV: 4 Detection Equipment: 16 Provides signal optimization and congestion relief along Watson from I-10 to current southern terminus	$777,000	City	Buckeye ITS Strategic Plan
Yuma Road from I-10 to Verrado Way	Miles of Fiber: 4.5 Miles of Conduit: 1 Traffic Signal Links: 5 CCTV: 5 Detection Equipment: 20 Provides signal optimization and congestion relief along east-west route that can serve as detour to I-10	$565,000	City	Buckeye ITS Strategic Plan
Miller Road from MC 85 to I-10	Miles of Fiber: 4.25 Miles of Conduit: 4.25 Traffic Signal Links: 5 CCTV: 5 Detection Equipment: 20 Provides signal optimization and congestion relief through developed portion of Buckeye.	$101,5000	City	Buckeye ITS Strategic Plan

Table 9-1: Implementation Matrix (continued)

Project Name	Description	Cost Estimate	Responsible Party, Partners	Recommendation Source
Monroe Avenue from Miller Road to Watson Road	Miles of Fiber: 1.25 Miles of Conduit: 1 Traffic Signal Links: 6 CCTV: 6 EVP: 8 Detection Equipment: 24 Provides signal optimization and congestion relief through downtown between two major north/south arterials connecting to I-10	$612,000	City	Buckeye ITS Strategic Plan
Verrado Way from Yuma Road to Indian School Road	Miles of Fiber: 4.5 Miles of Conduit: 3.5 Traffic Signal Links: 2 CCTV: 2 Detection Equipment: 8 Provides signal optimization and congestion relief along most developed portion of Verrado Way (N/S arterial) and across I-10	$782,000	City	Buckeye ITS Strategic Plan
Traffic Signals	Construction of new traffic signals as shown on Figure 8-2	$120,000 each	Developer, City	TMP

9.4 Cost Estimating

For some transportation modes, previous planning documents provided cost estimates for the plan recommendations. When this information was available, it was used in cost estimating. In instances where cost estimates were not previously developed, cost estimates were created by using unit costs and estimating the total miles of each improvement type.

Streets

Cost estimates for the Street recommendations were calculated using a unit cost of dollars per mile of new roadway and dollars per lane-mile of roadway widening. Table 9-2 provides the unit costs that were used in these calculations. Several supporting assumptions were made in determining the unit cost. First, the cost estimates are presented in 2019 dollars. Right-of-Way (ROW) will be primarily acquired through the land development process; any additional ROW needed is anticipated to be minimal and is accounted for in the unit cost. Unit costs were developed on a cost per lane-mile basis and are based on recent cost history from MAG, MCDOT, and other MAG member cities. The roadway cost estimates for both new and widening scenarios reflect the cost of construction of the full cross section for that roadway classification for new roadways or the cost for the additional lanes for widened roadways, including subbase, base, paving, curb and gutter, median, sidewalks, utility relocation, pavement markings, drainage, and any other items, as needed, to adequately construct the roadway. The total miles of each new roadway type or total lane-miles of roadway widening were multiplied by the unit costs to provide the planning-level cost estimate indicated in Table 9-1, Implementation Matrix.

Table 9-2: Street Network Unit Costs

Improvement Type	Unit	Unit Cost
Roadway Widening	1 lane-mi	$1,500,000
Collector Roadway	1 mi	$4,500,000
4-Lane Arterial Roadway	1 mi	$8,000,000
6-Lane Major Arterial Roadway	1 mi	$11,000,000
6-Lane Parkway	1 mi	$12,000,000
8-Lane Parkway	1 mi	$15,000,000

In addition to constructing roadways, the operations and maintenance of the roadway once built is a significant investment by the City. Provided in Table 9-3 is the unit costs used to calculate the cost to operate and maintain the full roadway network once constructed.

Table 9-3: Annual Street Maintenance Costs

Maintenance Type	Unit	Unit Cost
Traffic Control Signals	Each	$2,940.62
Storm Drainage	Linear foot	$0.00040
Exterior Lighting, Pole	Each	$43.80
Road, Surfaced	Square yard	$0.84
Sidewalk and Walkway	Square yard	$0.00110
Grounds Drainage Dams	Each	$2,577.45
Road, Unsurfaced	Square yard	$0.48

Source: City of Buckeye, Maintenance Cost of Street, 2018

Transit

Cost estimates for the Transit recommendations were collected from the 2016 Buckeye Transit Plan and were incorporated into **Table 9-1**, Implementation Matrix. No unit cost calculations were conducted as part of this process.

Active Transportation

Cost estimates for the Active Transportation recommendations were not provided. Cost estimating for these facilities will be conducted as part of the upcoming Buckeye Bicycle and Pedestrian Master Plan.

Aviation

Cost estimates for the Aviation recommendations were collected from the 2007 Buckeye Municipal Airport Master Plan, the 2009 Buckeye Municipal Airport Noise Compatibility Study, and the Buckeye Municipal Airport Drainage and Utilities Study. These cost estimates were incorporated into **Table 9-1**, Implementation Matrix. No unit cost calculations were conducted as part of this process.

Rail

Cost estimates for the Rail recommendations were collected from the Commuter Rail System Study Update and the Wellton Branch Railroad Rehabilitation Study. These cost estimates were incorporated into **Table 9-1**, Implementation Matrix. No unit cost calculations were conducted as part of this process.

Freight

Cost estimates for the Freight recommendations were not provided.

ITS

Cost estimates for the ITS recommendations were collected from the 2018 ITS Strategic Plan and were incorporated into Table 9-1, Implementation Matrix. No unit cost calculations were conducted as part of this process.

9.5 Responsible Parties

In order to effectively implement recommendations identified in this TMP the City of Buckeye must work with partnering agencies on many of the projects. Provided in this section is a description of each of the partnering agencies and the types of improvements they will be a critical partner in.

City of Buckeye

The City of Buckeye will be responsible for implementing transportation infrastructure either through City funds, developer-paid infrastructure, or in partnership with the agencies included herein. The City will be expected to maintain roadways that are under their jurisdiction and will need to collaborate with other agencies as they look to invest in transportation infrastructure within the Buckeye MPA.

Arizona Department of Transportation

Arizona Department of Transportation (ADOT) is the multimodal transportation agency for the State of Arizona. The department is responsible for planning, designing, constructing, operating, and maintaining State Highways and Interstates, such as I-10, SR 85, and any future highways such as I-11 and SR 30, among others. Additionally, ADOT's Aeronautics Group will be involved in any plans or improvements to the Buckeye Municipal Airport.

Maricopa Association of Governments

Maricopa Association of Governments (MAG) is a Council of Governments (COG), which serves as the regional planning and policy agency for the metropolitan Phoenix area. MAG is the designated Metropolitan Planning Organization (MPO) for the region and is charged with planning the regional transportation system. As the MPO for the region, MAG prepares the Regional Transportation Plan and manages the Transportation Improvement Program. Additionally, MAG has conducted several framework studies that are referenced in this TMP and has been a valuable partner in conducting the travel demand modeling results for this TMP.

Maricopa County Department of Transportation

Maricopa County Department of Transportation (MCDOT) plans, designs, builds, maintains, and operates roadways within unincorporated areas of Maricopa County, as well as Sun Valley Parkway and MC85. To guide the design and development of these roadways, the County relies on two planning documents, the *Transportation System Plan (TSP) 2035* and the *Major Streets and Routes Plan (MSRP)*. Additionally, MCDOT provides design standards for Parkways that will be utilized in implementing future Parkways in Buckeye.

The MCDOT TSP 2035 identified improvements to several roadways within the Buckeye MPA, including:

- Roosevelt Street
- Tuthill Road
- Yuma Road
- Indian School Road
- MC 85
- Baseline Road
- Beloat Road
- Broadway Road
- Dean Road
- Elliot Road
- Hazen Road
- Jackrabbit Trail
- Lower Buckeye Road
- McDowell Road
- Southern Avenue
- Sun Valley Parkway

These improvements have been documented in Table 9-1, Implementation Matrix as projects in which MCDOT is responsible for implementing roadway improvements, whether through County funds or through developer-paid infrastructure.

Union Pacific Railroad

Union Pacific Railroad (UPRR) is a Class I freight hauling railroad company with a facility located within Buckeye. The Wellton Branch is owned and maintained by UPRR. UPRR will need to be involved in any planning for infrastructure that may impact their operations including any railroad crossings or commuter rail opportunities.

Valley Metro

Valley Metro is the regional public transportation agency for the Phoenix metropolitan area. Valley Metro has been a valuable partner to the City of Buckeye including conducting the 2016 Buckeye Transit Plan. As Buckeye continues to measure when and how to implement transit as the City grows, Valley Metro will be an important partner in these efforts.

9.6 Funding Sources

Over 56% of the TMP planning area consists of privately-owned land and another 15% consists of land owned by the Arizona State Land Department. For these areas, much of the recommended improvements would be constructed by a developer at the time of development. However, the remaining 29% of the land in the planning area consists of land owned by Bureau of Land Management, Arizona Game and Fish, Military Reservation, and Bureau of Reclamation. For these areas, it is anticipated development would not occur and therefore the cost of designing and constructing the transportation improvements may need to be paid by a combination of City, County, regional, state or federal funds. Additionally, the City may need to expedite a transportation project rather than waiting for development to occur through utilization of its scalloped streets ordinance. Funding at the federal, state, regional, and local level may be available for the projects identified in the TMP. The potential funding sources available for TMP implementation are summarized in Table 9-4.

Table 9-4: Funding Sources

Revenue Sources	Description
Federal	
Surface Transportation Block Grant Program	Provides funding that can be used by State and local agencies to improve highways, bridges, tunnels, pedestrian and bicycle infrastructure, and transit projects. Fixing America's Surface Transportation (FAST) Act provides long-term funding for surface transportation infrastructure planning and investment, authorizes $305 billion over FY 16 and 20. Funding is available for highway, motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.
Congestion Mitigation and Air Quality Program	Provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).
Highway Safety Improvement Program (HSIP)	The Highway Safety Improvement Program (HSIP) is a federal-aid program with the purpose of reducing traffic fatalities and serious injuries on public roads, including non-state-owned roads and roads on tribal land.
Federal Transit Administration - 5307 Urbanized Area Formula Grant Program	Provides federal funding, with a local match, to urbanized areas and states for transit capital, operating assistance, and transportation related planning.

Table 9-4: Funding Sources (continued)

Revenue Sources	Description
Federal Transit Administration - 5309 Capital Investment Grant Program	Provides federal funding for major capital investments, including heavy rail, commuter rail, and bus rapid transit. Projects seeking funding though this program must complete a series of steps over several years to be eligible for funding.
Federal Transit Administration - 5310 Enhanced Mobility of Seniors and Individuals with Disabilities Program	Provides federal funding to states or local government authorities for the purpose of assisting private nonprofit groups in meeting the transportation needs of the elderly and persons with disabilities.
Airport and Airway Trust Fund	This is the main funding source for federal aviation programs as well as funds the Federal Aviation Administration (FAA). The Trust Fund is funded through taxes on airline ticket sales, aviation fuel, air cargo, and the flight segment tax. Funds from the Trust are distributed annually by the FAA from appropriations by Congress. Funding may cover both capital and operating costs
Airport Improvement Program	Provides grants to public agencies for public-use airport. An eligible airport must be a part of the National Plan of Integrated Airport Systems (NPIAS), which identifies existing and proposed airports that are eligible for AIP grants due to their significance to national air transportation. As of 2017, Buckeye Municipal Airport is listed as a NPIAS airport.
State	
Highway User Revenue Fund (HURF)	The State of Arizona taxes motor fuels and collects a variety of fees and charges relating to the registration and operation of motor vehicles on public highways. These collections include gasoline and use-fuel taxes, motor-carrier taxes, vehicle-license taxes, motor vehicle registration fees and other miscellaneous fees. These revenues are deposited in the HURF and are then distributed to the cities, towns and counties and to the State Highway Fund for highway construction, improvements, and other related expenses. The City of Buckeye can request HURF funding through the MAG TIP.
Vehicles License Tax (VLT)	The VLT is included as part of the annual vehicle registration fee. This is based on the assessed value of the vehicle. Revenue from this tax goes into the HURF fund.

Table 9-4: Funding Sources (continued)

Revenue Sources	Description
Arizona Aviation Fund	Distribution of these funds is allocated through the Airport Capital Improvement Program, developed by Arizona Department of Transportation (ADOT), which maximizes the use of both state and FAA funds. State funds are derived from flight property tax, aircraft lieu taxes, and aviation fuel taxes. Funds within the State Aviation Fund are distributed between design/construction projects, planning projects, and land acquisition. The State Transportation Board approves the distribution of these funds annually. Through the Fund, the state can match federal grants and can also provide state-funded grants for airport projects that quality. ADOT also has an Airport Loan Program, which provides funding for airport improvements to eligible airports. Such loans are provided to improve the economic status of the airport.
ADOT Local Public Agency (LPA)	State program that assists local agencies in utilizing federal funds for local government projects as well as oversight for such projects.
Regional	
Local Transportation Excise Tax	Municipalities can adopt a transportation excise tax that ranges between 0.2% and 0.5%. In Maricopa County, there has been a voter-approved half-cent sales tax through Prop 400, called the Transportation Excise Tax (TET). Revenue from Prop 400 provides a potential funding source for the arterial life cycle program, regional freeway systems, and transit services at the local level. The regional sales tax is set to expire in 2025. Projects that are submitted to Maricopa County for funding are incorporated into the Regional Transportation Plan (RTP).
Local Transportation Assistance Fund II (LTAF)	LTAF is a public transportation fund that is funded through the Arizona lottery proceeds. In Maricopa County, funds for public transportation are capped at $18 million.
MAG Transportation Improvement Program (TIP)	Funding program that identifies specific projects within a five-year schedule. Through the program, MAG lists Calls for Projects, which are listings of project opportunities for which they have funding for.
MAG Traffic Signal Optimization Program (TSOP)	Provides technical assistance to agencies that own and operate traffic signal systems. The program allocates a total of $300,000 (increasing to $500,000 in FY 2020) for TSOP projects, for which local agencies can submit applications through Calls for Projects.
MAG Bicycle and Pedestrian Master Plans and First Time Updates Program	This program provides funding for member agencies to develop bicycle and pedestrian master plans. Projects for this program are annually recommended through the MAG Active Transportation Committee.
MAG Design Assistance Program	The MAG Design Assistance Program funds design assistance projects for pedestrian and bicycle facilities.

Table 9-4: Funding Sources (continued)

Revenue Sources	Description
Local	
Private Funds	Private funds are provided by land developers and are used as part of a land development project.
General Fund	The general fund accounts for the majority of the financial resources of the City that are not accounted for in other funds. It includes property taxes, local taxes, and service charges. While the general fund is a potential funding source for some transportation projects, it is recommended that other sources be used primarily so that the general fund can be conserved for City operations.

APPENDIX A

Buckeye I-11 Alternative Review and Preferred Alignment Recommendation

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BUCKEYE, AZ

Interstate 11 Alternatives Review & Preferred Alignment Recommendation

City of Buckeye
Engineering & Development Services Departments

City Engineer, Scott Zipprich, P.E.
Director of Development Services, George Flores
Deputy City Engineer, Paul Lopez, P.E.
Deputy Director of Development Services, Terri Hogan, A.I.C.P
Senior Project Engineer (Traffic) John Willett, P.E., P.T.O.E.
Principal Planner, Adam Copeland
Principal Planner, Ed Boik, A.I.C.P.

7.18.19

I. INTRODUCTION:

Federal Highway Administration (FHWA) has considered a high-capacity, high priority, north-south transportation facility through the western United States (U.S.) that will connect the U.S. market with the Canadian and Mexican market for more than 25 years now. The facility is known as Interstate 11 (I-11). The current study area is a 280 mile long segment between Nogales and Wickenburg that runs through the counties of Santa Cruz, Pima, Pinal, Maricopa, and Yavapai. If constructed the future I-11 will be about 400' wide.

Arizona Department of Transportation (ADOT) in coordination with FHWA has engaged in the development of a Tier 1 Environmental Impact Statement (EIS). ADOT considered 3 separate alignments as part of their Draft Tier 1 Environmental Impact Statement (EIS). The three alignments for ADOT were identified by different colors. The 3 alignments from west to east are the orange alignment, the green alignment, and the purple alignment. Each alignment was considered to be a 2000' wide section. The ADOT Recommended Alternative is shown in Blue. The following 4 exhibits have been attached in Appendix A of this document for reference:

- Exhibit 1: Draft Transportation Master Plan
- Exhibit 2: Community Master Plans
- Exhibit 3: General Plan 2040 Land Use
- Exhibit 4: General Plan Target Densities

A future Tier 2 study, pending the completion of the Tier 1 EIS and selected corridor alternative, will refine and identify the location of the I-11 more specifically. For more information on this please see the attached presentation in Appendix B.

Simultaneous but unrelated to the ADOT Draft Tier 1 EIS, the City of Buckeye (COB) has been working on their Transportation Master Plan (TMP). The COB TMP is a Multimodal planning tool that allows Buckeye to forecast growth, need, and opportunity as it relates to the Municipal Buildout of Buckeye. Buckeye is a 640+ square mile Metropolitan Planned Organization (MPO). The COB 2040 General Plan was ratified as recently as 2018. There are over 23 Master Planned Communities (MPC's) within the COB ranging from just a few square miles in land mass to over 50 square miles in land mass. The TMP utilizes the land use planning from the General Plan and CMP's, and focuses on 7 primary areas within Buckeye including Streets, Transit, Active Transportation, Aviation, Rail, Freight, and Intelligent Transportation Systems (ITS). Each of these chapters within the COB TMP considers the specific multi-modal area or function, as well as its impact and synergy with the other multimodal areas and functions. In particular within

Chapter 2-"Streets" of the TMP, the document focuses on the buildout Roadway Network for the City. In it the reader can find the references to I-11 and State Route 30 (SR30) otherwise known as the I-10 reliever. In the TMP, the I-11 initially recommended was the alignment from the Hassayampa Valley Framework Study. More recently due to the ADOT Draft Tier 1 EIS being released, the City has added the three (3) alternative alignments to the TMP maps along with the ADOT recommended alternative. Below is a summary of the options from the City's perspective.

a. Hassayampa Frame Work Study (Red)
The recommended alignment for I-11 in this study, is along 355th Avenue. I-11 then begins to curve to the east at the Jomax Road Alignment (entering the City at about the Pinnacle Peak Road alignment) and then ties into the proposed White Tanks Freeway (SR 505) most near the intersection of Pinnacle Peak Road and 331st Avenue. From there the freeway bears directly south along the 331st Avenue alignment until about the intersection with Greenway Road, at which point the I-11 departs once again to the south west (leaving the City at the Hidden Waters Parkway alignment). It extends south-westerly (outside the City of Buckeye) until reaching the intersection of approximately Cactus Road and 335th Avenue. At that point the I-11 continues due south until about the Bethany Home Alignment. At that point it diverts to the west until intersecting the I-10 freeway at Wickenburg Road (363rd Avenue). South of I-10 the I-11 departs south-easterly to a point most near the intersection of Ray Road and Hidden Waters Parkway (entering back into the City of Buckeye). At that point the I-11 curves to the east and runs through the City of Buckeye along the Chandler Heights Road alignment until exiting the City near the Riggs Road alignment. As can be seen in Exhibit 1 of Appendix 1, the Hassayampa alignment is very similar to the purple alignment until such time that the I-11 bears east on the proposed SR30 alignment.

b. ADOT I-11 Recommended Corridor Alternative (Blue)–
It enters the City from the north along the Wickenburg Road (363rd Avenue) alignment at the Beardsley Road intersection. It continues south for approximately 4 miles veering to the east and exiting the City near the 347th Avenue alignment.

It continues south-west until intersecting I-10 near the Wickenburg Road (363rd Avenue) alignment. It continues south-easterly and then curves to the east along the Elliot Road (I-10 reliever/State Route (SR 30)) alignment where it re-enters the City at approximately the 319th Avenue alignment. It continues east along the SR 30 alignment connecting with the Loop 303 at the Buckeye/Goodyear border.

c. Option A (Green) –
I-11 enters the City from the north along the Wickenburg Road (363rd Avenue) alignment at the Beardsley Road intersection. It continues south for approximately 4 miles veering to the east and exiting the City near the 347th Avenue alignment. It continues south-west until intersecting I-10 near the Wickenburg Road (363rd Avenue) alignment.

It then bears easterly utilizing I-10 until intersecting SR 85 (reentering the City at about the 331st Avenue alignment). From SR-85 and I-10 it redirects due south along SR-85 until approximately the Germann Road alignment at which point it curves south-easterly. It continues south-easterly eventually exiting the City near Riggs Road.

d. Option B (Orange) –
I-11 extends from the north and runs adjacent to the western limit of the City of Buckeye between Beardsley Road and Greenway Road. From that point the alignment remains outside and the west of the City until intersecting I-10 at Wickenburg Road (363rd Avenue).

It then bears easterly utilizing I-10 until intersecting SR 85 (reentering the City at about the 331st Avenue alignment). From SR-85 and I-10 it redirects due south along SR-85 (exiting the City at the Woods Road alignment) until intercepting Interstate 8. The alignment then continues east along Interstate 8.

e. Option C (Purple) –
I-11 extends from the north, and begins to curve to the east at the Jomax Road Alignment (entering the City at about the Pinnacle Peak Road alignment) and then ties into the proposed White Tanks Freeway (SR 505) most near the intersection of Pinnacle Peak Road and 331st Avenue. From there the freeway bears directly south along the 331st Avenue alignment until about the intersection with Bell Road, at which point the I-11 departs once again to the south-west (leaving the City at the 355th Avenue alignment).

I-11 continues south-west until intersecting I-10 near the Wickenburg Road (363rd Avenue) alignment. From there I-11 continues south-easterly and then curves to the east along the Elliot Road (I-10 reliever/State Route (SR) 30) alignment where it re-enters the City at approximately the 319th Avenue alignment.
It continues east along the SR 30 alignment connecting with the Loop 303 at the Buckeye/Goodyear border.

The width of each corridor was assumed to be 2000' wide. Although the width of the freeway will be closer to 400' in width, a larger number is typically utilized to conservatively cover a wider reach for environmental clearance in the event that there are minor realignments for any of the options. The purpose of this white paper is to provide staffs recommended alignment for the I-11 corridor. With a solid background and introduction, the remainder of this paper will focus on COB staff's recommendations from the perspective of Planning and Engineering. Each section will first list the topic for consideration and then follow with a list the Pros and Cons for each alignment from staff's perspective. At the conclusion of the paper staff will recommended an alternative from the Perspective of the COB Engineering and Development Services (Planning) Departments.

II. PLANNING CONSIDERATIONS:

a. Land Use Compatibility

i. HASSAYAMPA FRAMEWORK STUDY (RED)

1. Pros-
    a. The corridor follows the adopted Douglas Ranch Community Master Plan and goes through the economic heart of the community.
    b. Of all corridors, this corridor provides the most opportunities for surface street interchanges in Douglas Ranch.
    c. The corridor easily connects to the planned White Tanks Freeway (SR 505) corridor.
    d. South of I-10, I-11 will be located in the far southern portion of Buckeye which may bring future economic development opportunities to the area.
2. Cons-
    a. South of I-10 the corridor will negatively impact natural, pristine desert open spaces that are considered high value and important to the City.
    b. This route, especially south of I-10, will not generate an immediate economic development impact. Furthermore the costs and impacts to natural areas will be far too great.

ii. ADOT I-11 RECOMMENDED CORRIDOR ALTERNATIVE (BLUE)

1. Pros-
    a. Despite relocating to the western 1/3 of Douglas Ranch, nearly 4 miles removed from the approved CMP alignment, I-11 is located within Douglas Ranch which can bring economic development opportunities to the community. Additionally, the proposed White Tanks Freeway (SR 505) corridor could be realigned

to pass through the economic center of Douglas Ranch and connect with the realigned I-11.

b. South of I-10, I-11 will parallel I-10 and activate a major planned industrial and employment area located west of SR-85 and along the Union Pacific Rail Road.
c. This corridor utilizes the SR-30 alignment and can bring significant interstate and international traffic through the downtown Buckeye and Gila River areas.
d. Using the SR-30 alignment allows for federal highway monies to be leveraged and potentially expedite the construction of the badly needed I-10 reliever.
e. The corridor is supported by the El Rio District specific area plan.
f. The corridor can be dual purposed along the Gila River and also act as a levee to bring thousands of acres of developable land out of designated flood plan.

2. Cons-
    a. The realignment of the road in Douglas Ranch will require a revision to the Douglas Ranch Community Master Plan. I-11 no longer passes through the economic heart of Douglas Ranch.
    b. The corridor will require the realignment of the White Tanks Freeway (SR 505) corridor which will further disrupt Douglas Ranch's master plan.
    c. This corridor provides limited surface street interchange opportunities in Douglas Ranch.
    d. The alignment could bring significant international truck traffic between the downtown Buckeye area and the Gila River generating land use and pollution impacts. It complicates the ability to establish strong links between downtown and future development along the Gila River.
    e. The new freeway right-of-way will be wide and consume developable land and potentially fragment the City.

iii. OPTION A (GREEN)

1. Pros-
    a. Despite relocating to the western 1/3 of Douglas Ranch, nearly 4 miles removed from the approved CMP alignment, I-11 is located within Douglas Ranch which can bring economic development opportunities to the community. Additionally, the proposed White Tanks Freeway (SR 505) corridor could be realigned

to pass through the economic center of Douglas Ranch and connect with the realigned I-11.

b. Follows the I-10 and SR-85 corridors through much of Buckeye which concentrates traffic on the established corridors. This prevents future fragmentation of the community due to the large freeway right-of-way corridor.

2. Cons-

a. The realignment of the road in Douglas Ranch will require a revision to the Douglas Ranch Community Master Plan. I-11 no longer passes through the economic heart of Douglas Ranch.

b. The corridor will require the realignment of the White Tanks Freeway (SR 505) corridor which will further disrupt Douglas Ranch's master plan.

c. This corridor provides limited surface street interchange opportunities in Douglas Ranch.

d. The southern portion of the corridor goes through BLM land which the City has designated as open space in the General Plan. This alignment will spoil the natural desert aesthetics.

iv. OPTION B (ORANGE)

1. Pros-

a. Despite relocating to the western limit of Douglas Ranch, nearly 8 miles removed from the approved CMP alignment, I-11 is located within Douglas Ranch which can bring economic development opportunities to the community. Additionally, the proposed White Tanks Freeway (SR 505) corridor could be realigned to pass through the economic center of Douglas Ranch and connect with the realigned I-11.

b. The new freeway right-of-way will reduce the potential to fragment the Douglas Ranch CMP.

2. Cons-

a. Douglas Ranch and the entire Sun Valley Corridor will not benefit as much from this alignment.

b. This corridor provides minimal to no surface street interchange opportunities in Douglas Ranch.

c. The realignment of the road in Douglas Ranch will require a revision to the Douglas Ranch Community Master Plan. I-11 no longer meaningfully passes through Douglas Ranch.

d. The alignment will spoil and impact the Belmont Mountains which are a significant open space, recreational, and visual amenity in the southwest portion of Douglas Ranch.

e. The alignment will put significant interstate and international traffic on I-10, which is already expected to be severely congested.
f. The alignment will activate SR-85 but doesn't address the lack of freeway transportation corridors in the western part of Buckeye.
g. Utilizing the already existing I-10 and SR-85 corridors removes some economic development potential south of the I-10 in the City.

v. OPTION C (PURPLE)
1. Pros-
a. The corridor follows the adopted Douglas Ranch Community Master Plan and goes through the economic heart of the community.
b. The corridor easily connects to the planned White Tanks Freeway (SR 505) corridor.
c. This corridor provides many opportunities for surface street interchanges in Douglas Ranch.
d. South of I-10, I-11 will parallel I-10 and activate a major planned industrial and employment area located west of SR-85 and along the Union Pacific Rail Road.
e. This corridor utilizes the SR-30 alignment and can bring significant interstate and international traffic through the downtown Buckeye and Gila River areas.
f. Using the SR-30 alignment allows for federal highway monies to be leveraged and potential expedite the construction of the badly needed I-10 reliever.
g. The corridor is supported by the El Rio District specific area plan.
h. The corridor can be dual purposed along the Gila River and also act as a levee to bring thousands of acres of developable land out of designated flood plan.
2. Cons-
a. The alignment could bring significant international truck traffic between the downtown Buckeye area and the Gila River generating land use and pollution impacts. It complicates the ability to establish strong links between downtown and future development along the Gila River.
b. The new freeway right-of-way will be wide and consume developable land and potentially fragment the city.

III. ENGINEERING CONSIDERATIONS:

a. Buckeye Transportation Impacts

i. HASSAYAMPA FRAMEWORK STUDY (RED)

1. Pros –
    a. North of I-10
        i. Provides approximately 9 miles of I-11 freeway frontage within Buckeye including a system interchange (I-11/White Tanks Freeway SR 505).
        ii. If FWHA/ADOT limits access within 2 miles of a system interchange, approximately 5 miles of frontage is available for service interchanges.
            1. At 2-mile spacing service interchanges will be limited to 3 or 4 within Buckeye.
    b. South of I-10
        i. Provides freeway access to southern portion of City with a system interchange (I-11/ Oglesby Road SR 85).
        ii. Provides 3 east-west freeways through Buckeye (I-10, SR 30, and I-11).
        iii. Supports additional capacity for I-10, SR 30 and SR 85 through City by providing dedicated freeway for I-11 traffic.
        iv. If FWHA/ADOT limits access to every 2 miles along the I-11, there is approximately 20 miles of freeway frontage available in south Buckeye
            1. At 2-mile spacing, service interchanges will be limited to about 8 service interchanges
2. Cons –
    a. North of I-10
        i. With 9 miles of freeway frontage within Buckeye requiring a 400’ right-of-way (r/w) width that is about 440 acres of undevelopable land. Together with the land required for the system TI and 3-4 service TI’s could accumulate to approximately 480 acres of undevelopable land. However, if the freeway was not built in this location, it is likely a parkway or arterial roadway would take its place, allowing for more developable land.

b. South of I-10
    i. With the freeway located within Bureau of Land Management (BLM) east of SR 85 there may not be any service interchanges to serve Buckeye.
    ii. A portion of freeway will be located within or adjacent to sensitive riparian area near Gillespie Dam and Bridge.

ii. ADOT I-11 RECOMMENDED CORRIDOR ALTERNATIVE (BLUE)
1. Pros –
    a. North of I-10
        i. Provides about 4 miles of I-11 freeway frontage within Buckeye including a system interchange (I-11/SR 505).
        ii. If FWHA/ADOT limits access within 2 miles of a system interchange, approximately 4 miles of frontage is available for service interchanges.
            1. At 2-mile spacing service interchanges will be limited to 0 or 1 within Buckeye.
        iii. The frontage of SR 505 could increase 5 miles with 3 miles available for service interchanges.
            1. At 2-mile spacing there could be 1 or 2 service interchanges on SR 505.
    b. South of I-10
        i. Follows proposed SR 30 alignment between western boundary and Loop 303 (not a new location for freeway).
        ii. Takes I-11 traffic adjacent to City's industrial planning areas east and west of SR 85.
        iii. Supports additional capacity for I-10 and SR 85 through City by providing dedicated freeway for I-11 traffic.
2. Cons –
    a. North of I-10
        i. There will be very limited access from local roadways to I-11 within the north portion of Buckeye.
        ii. With 4 miles of freeway frontage within Buckeye requiring a 400' right-of-way (r/w) width that is approximately 200 acres of undevelopable land. Together with the land required for the system TI and 0-1 service TI's could accumulate to approximately 220

acres of undevelopable land. However, if the freeway was not built in this location, it is likely a parkway or arterial roadway would take its place, allowing for more developable land.

b. South of I-10
    i. Only provides 2 east-west freeways through Buckeye (I-10 & SR 30/I-11)
    ii. Does not provide freeway access to the City south of the Gila River.
    iii. The proposed east-west portion of I-11 will have higher traffic volumes (the I-11 traffic passing through and the local generated traffic that would have used SR 30).
    iv. If FWHA/ADOT limits access to every 2 miles along the I-11, there is approximately 20 miles of freeway frontage available in south Buckeye
        1. At 2-mile spacing, service interchanges will be limited to about 8 service interchanges.
    v. Bisects Agricultural farms causing the need for operations and equipment to be severed and multiplied.
    vi. Potential to impact historic Palo Verde Community and School.
    vii. Potential to impact successful dairies.
    viii. Potential to impact existing residential subdivisions.

iii. OPTION A (GREEN)
    1. Pros –
        a. North of I-10
            i. Provides about 4 miles of I-11 freeway frontage within Buckeye including a system interchange (I-11/SR 505).
            ii. If FWHA/ADOT limits access within 2 miles of a system interchange, approximately 4 miles of frontage is available for service interchanges.
                1. At 2-mile spacing service interchanges will be limited to 0 or 1 within Buckeye.
            iii. The frontage of SR 505 could increase 5 miles with 3 miles available for service interchanges.

1. At 2-mile spacing there could be 1 or 2 service interchanges on SR 505.

b. South of I-10

i. SR 30 east of SR 85 remains, provides 3 east-west freeways through Buckeye east of SR 85.

2. Cons –

a. North of I-10

i. There will be very limited access from local roadways to I-11 within the north portion of Buckeye.

ii. With 4 miles of freeway frontage within Buckeye requiring a 400' right-of-way (r/w) width that is approximately 200 acres of undevelopable land. Together with the land required for the system TI and 0-1 service TI's could accumulate to approximately 220 acres of undevelopable land. However, if the freeway was not built in this location, it is likely a parkway or arterial roadway would take its place, allowing for more developable land.

b. South of I-10

i. Only provides 2 east-west freeways through west portion of Buckeye (I-10 & SR 30).

ii. Does not provide additional freeway access to southern portion of City between Gila River and SR 85.

iii. The proposed north-south portion of I-11/SR 85 from Gila River to the north will have higher traffic volumes (the I-11 traffic passing through and the local generated traffic that would have used SR 85) requiring more travel lanes.

iv. OPTION B (ORANGE)

1. Pros –

a. North of I-10

i. Provides about 3 miles of I-11 freeway frontage within Buckeye including a system interchange (I-11/SR 505).

ii. If FWHA/ADOT limits access within 2 miles of system interchange, then 0 miles of I-11 frontage are available for service interchanges.

1. At 2-mile spacing there could be 0 service interchanges on I-11 within Buckeye.

iii. The frontage of SR 505 could increase 7 miles with 5 miles available for service interchanges.

1. At 2-mile spacing there could be 3-4 service interchanges on SR 505.

b. South of I-10

i. Follows proposed I-10 and SR 85 alignments (not a new location for freeway).

ii. SR 30 remains.

2. Cons –

a. North of I-10

i. Depending on how SR 505 connects to I-11, there may not be any access from local roadways to I-11 within the north portion of Buckeye.

ii. With 3 miles of freeway frontage within Buckeye requiring a 400' right-of-way (r/w) width that is about 150 acres of undevelopable land plus that required for the system TI. However, if the freeway was not built in this location, it is likely a parkway or arterial roadway would take its place, allowing for more developable land.

b. South of I-10

i. Only provides 2 east-west freeways through Buckeye (I-10 & SR 30).

ii. Does not provide additional freeway access to southern part of the City

iii. Reduces capacity for I-10 and SR 85 by combining I-11 traffic with I-10 and SR 85 traffic, requiring more lanes or freeways may become more congested.

v. OPTION C (PURPLE)

1. Pros –

a. North of I-10

i. Provides about 10 miles of I-11 freeway frontage within Buckeye including a system interchange (I-11/SR 505).

ii. If FWHA/ADOT limits access within 2 miles of system interchange, then 6 miles of I-11 frontage are available for service interchanges.

1. At 2-mile spacing there could be 3-4 service interchanges on I-11 within Buckeye.

b. South of I-10
   i. Follows proposed SR 30 alignment between western boundary and Loop 303 (not a new location for freeway).
   ii. Takes I-11 traffic adjacent to City's industrial areas on both side of SR 85.
   iii. Provides additional capacity for I-10 and SR 85 through City by providing dedicated freeway for I-11 traffic.

2. Cons –
   a. North of I-10
      i. With 10 miles of freeway frontage within Buckeye requiring a 400' right-of-way (r/w) width that is about 490 acres of undevelopable land.
      ii. Together with the land required for the system TI and 4-5 service TI's could accumulate to approximately 560 acres of undevelopable land. However, if the freeway was not built in this location, it is likely a parkway or arterial roadway would take its place, allowing for more developable land.

   b. South of I-10
      i. Only provides 2 east-west freeways through Buckeye (I-10 & SR 30/I-11).
      ii. Does not provide additional freeway access to south part of the City.
      iii. The proposed east-west portion of I-11 will have higher traffic volumes (the I-11 traffic passing through and the local generated traffic that would have used SR 30).
      iv. If FWHA/ADOT limits access to every 2 miles along the I-11, there could be 2-4 fewer service interchanges within Buckeye along the SR 30/I-11 alignment.
      v. Bisects Agricultural farms causing the need for operations and equipment to be severed and multiplied.
      vi. Potential to impact historic Palo Verde Community and School.
      vii. Potential to impact successful dairies.
      viii. Potential to impact existing residential subdivisions.

IV. **CONCLUSION**:

In concluding, City of Buckeye the Engineering and Development Services Departments recommend soliciting input from additional City departments including but not limited to Economic Development, Public Safety, and Public Works. The Engineering and Development Services recommendation is:

- For areas north of I-10, The RED Hassayampa Framework Study Corridor should be used to the greatest extent possible. This preserves the integrity of the Douglas Ranch Community Master Plan and provides the greatest economic development opportunities for the City of Buckeye. Alternatively, PURPLE Option C is an almost exact alignment which would be substantially consistent with the adopted Douglas Ranch Community Master Plan.

- For areas south of I-10, The PURPLE ADOT recommended corridor or Option C is recommended with a minor realignment. It utilizes the proposed SR-30 corridor and activates significant industrial and employment opportunities west of SR-85. This corridor has the potential to generate the most amount of economic activity. West of SR-85, as the I-11 alignment turns from south to east, a realignment is recommended by staff as shown in Exhibit C, of the Mayor's letter attached as Appendix C of this document. This minor realignment is being proposed to support existing agricultural operations, navigate around at least two separate dairies, eliminate crossing of Buckeye canal, and avoid impacts to the historic Palo Verde community and school . Depending on the freeway structure it can also assist in flood plain mitigation adjacent to the Gila River. East of SR-85, as design progresses, it will be of critical importance for the roadway to be carefully designed to integrate local heritage and arts, allow strong and frequent surface connections, and minimize visual obtrusiveness between downtown and the Gila River (per the El Rio District specific area plan). Additionally east of SR-85, this corridor can assist with flood plain mitigation if the corridor is adjusted nearer to the river and the design integrates a levee. Lastly, this corridor ensures that the open space, BLM lands, and Sonoran Desert National Monument south of the Gila River are preserved and not impacted by habitat dissection or pollution.

Staff feels the two recommendations presented above, for the areas south and north of the I-10, may be combined to create the best alignment for the City of Buckeye. It is very close to the PURPLE Option C with a minor change in alignment, and demonstrates the potential to provide:

- The greatest near term Economic Development Impact for the City

- Most compatible with the 2040 adopted General Plan Land Uses
- Most consistent with the adopted CMP's
- Aligns best with the Draft Transportation Master Plan.

As the project moves forward, it will be important for the City to understand the traffic characteristics and Economic Development Opportunities, so that proper land use decisions can be made in future updates to the General Plan, CMP's and Amendments, as well as the Transportation Master Plan Updates.

APPENDIX A: MAPPING EXHIBITS

EXHIBIT 1: DRAFT TRANSPORATION MASTER PLAN

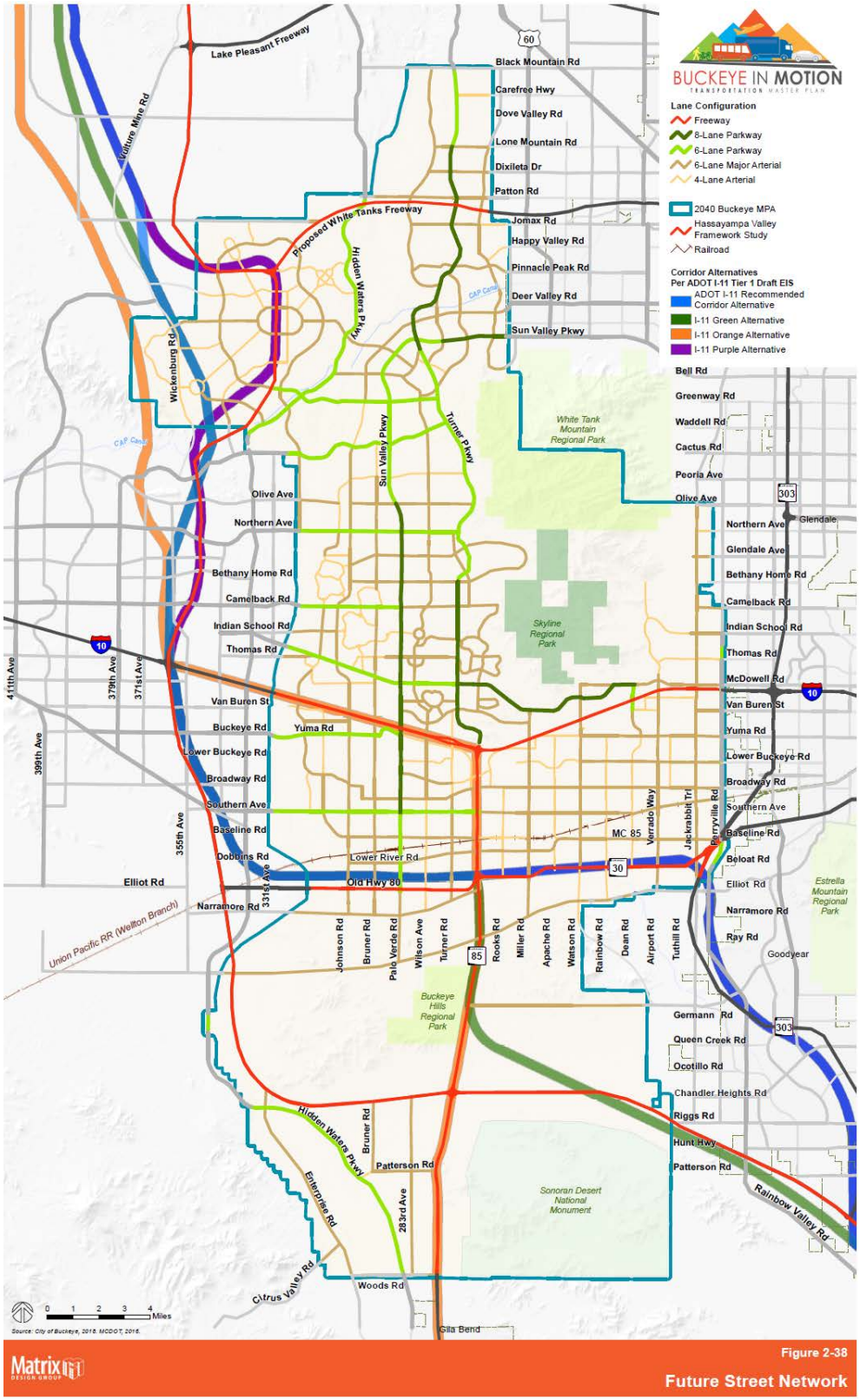


EXHIBIT 2: COMMUNITY MASTER PLANS

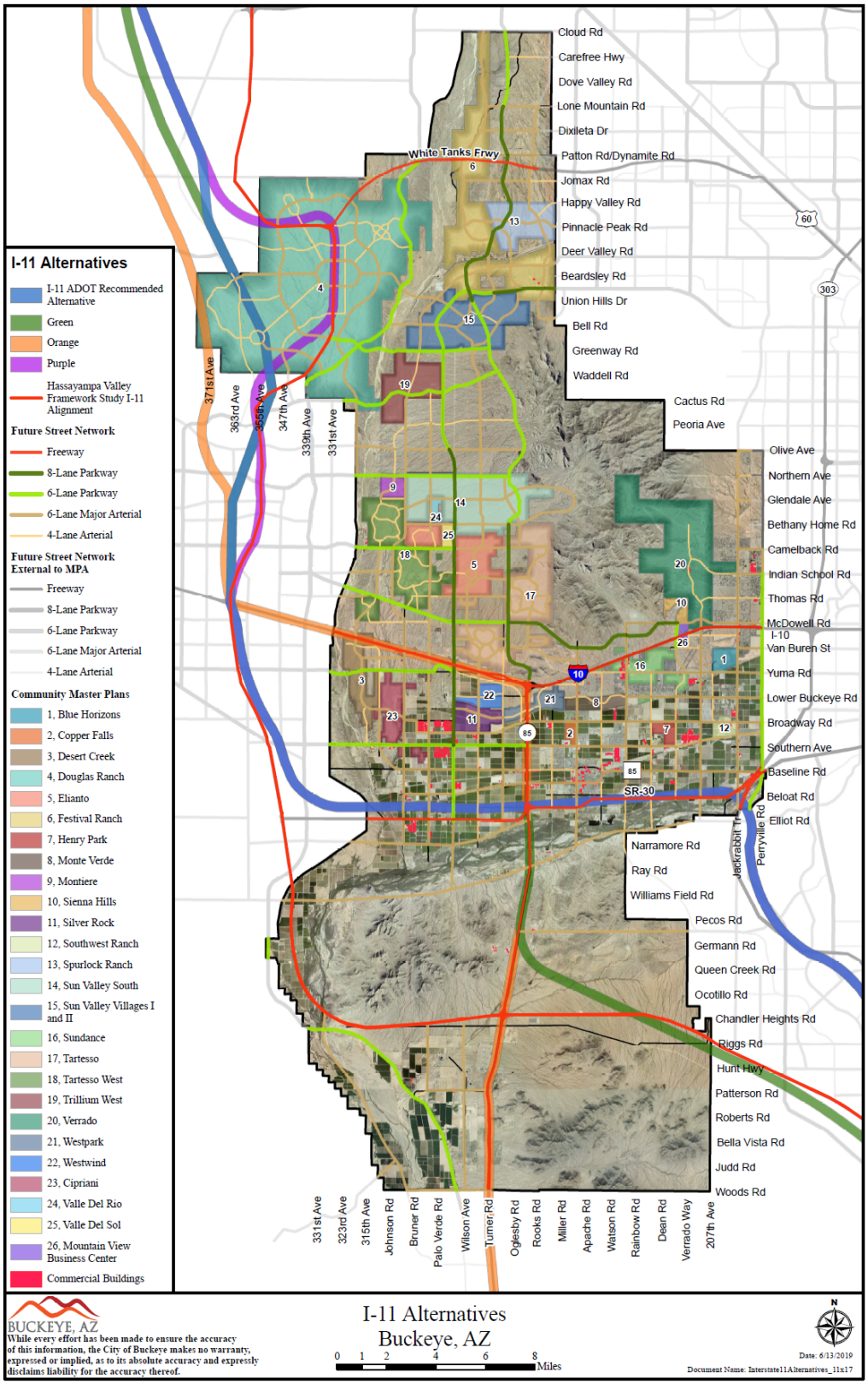


EXHIBIT 3: GENERAL PLAN 2040 LAND USE

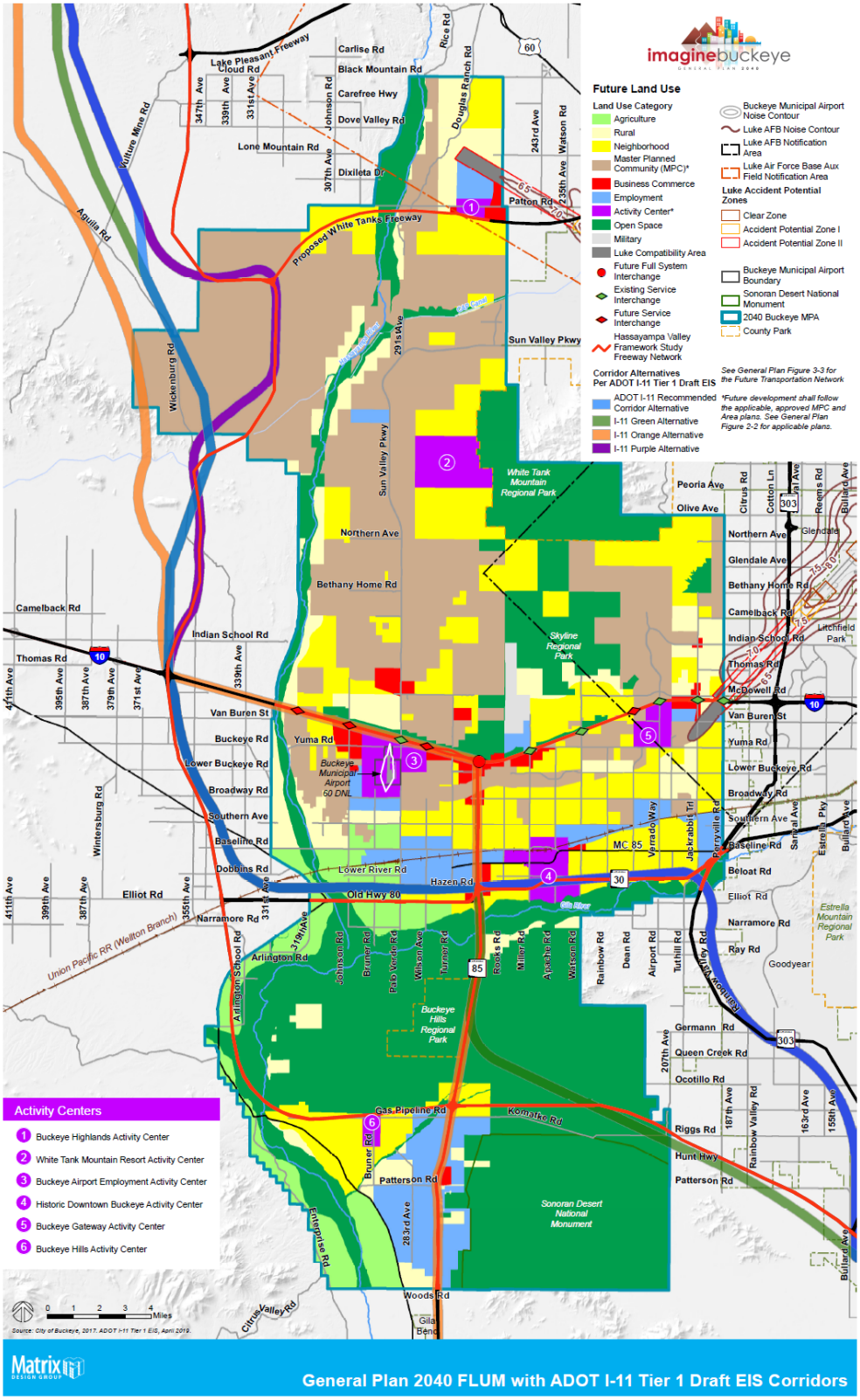
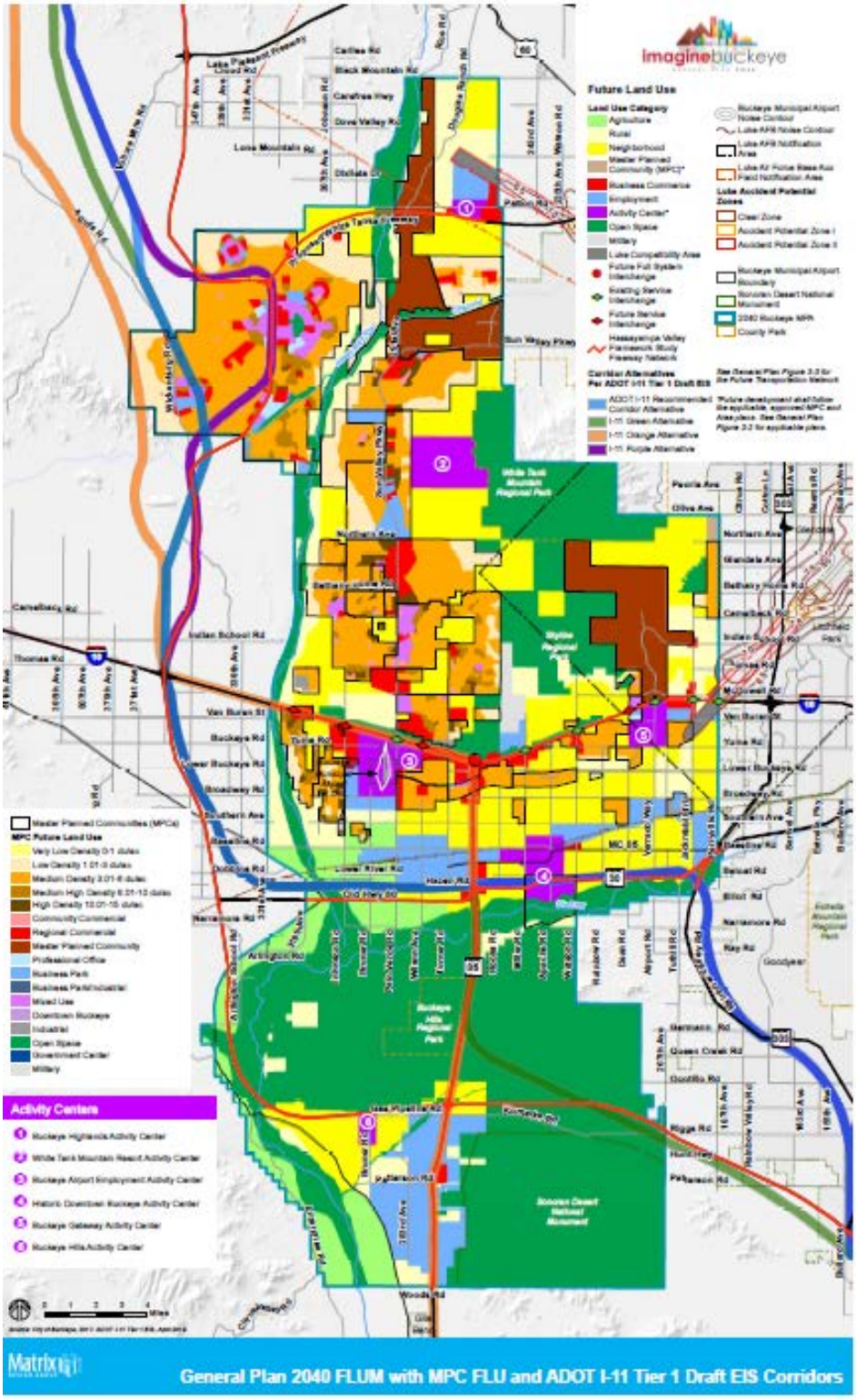


EXHIBIT 4: GENERAL PLAN 2040 TARGET DENSITIES



APPENDIX B: KEY FIGURES FROM THE ADOT TIER 1 EIS

TIER 1 ENVIRONMENTAL IMPACT STATEMENT

11

U.S. Department of Transportation
Federal Highway Administration

ADOT

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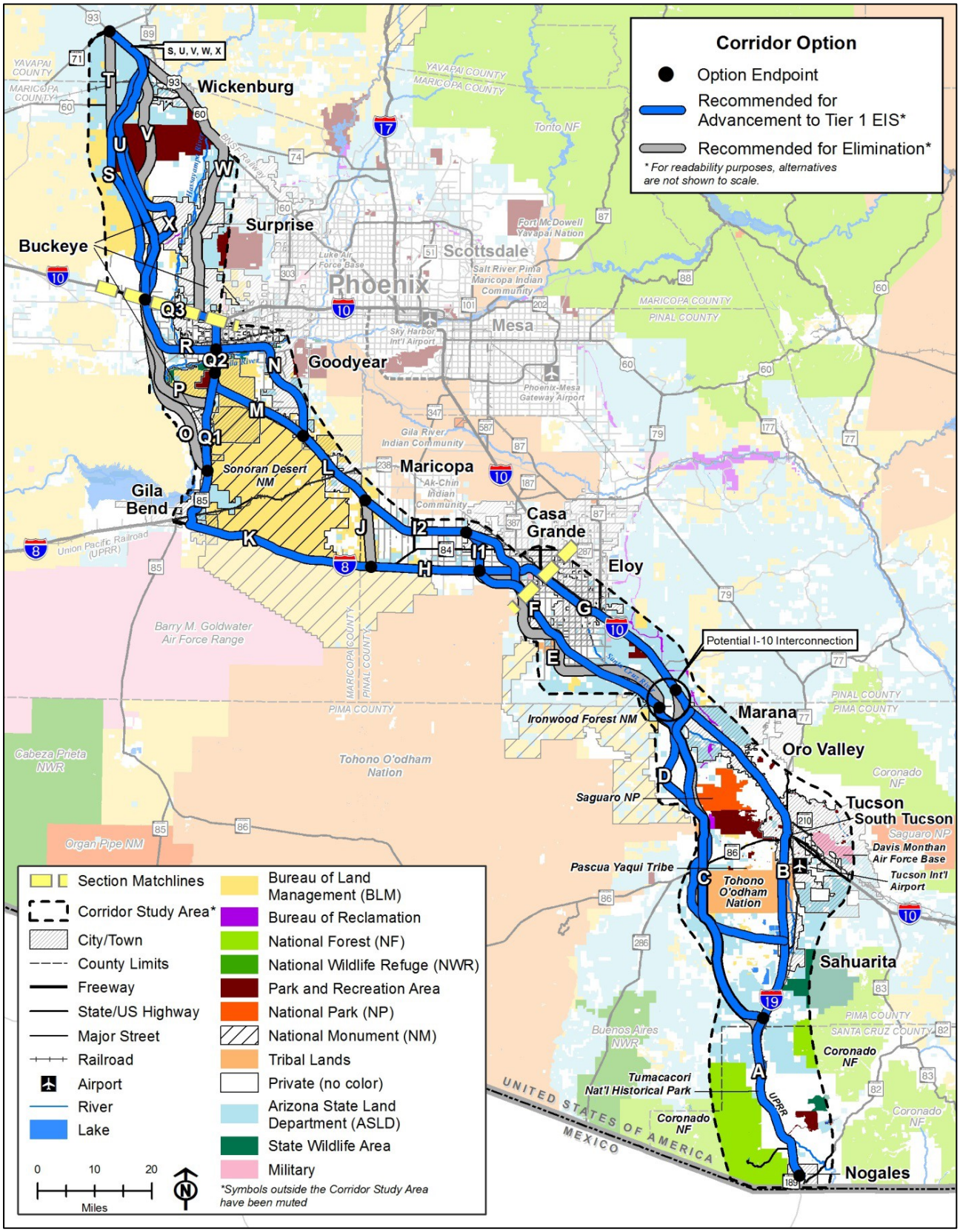


Figure 2-4 Range of Corridor Options

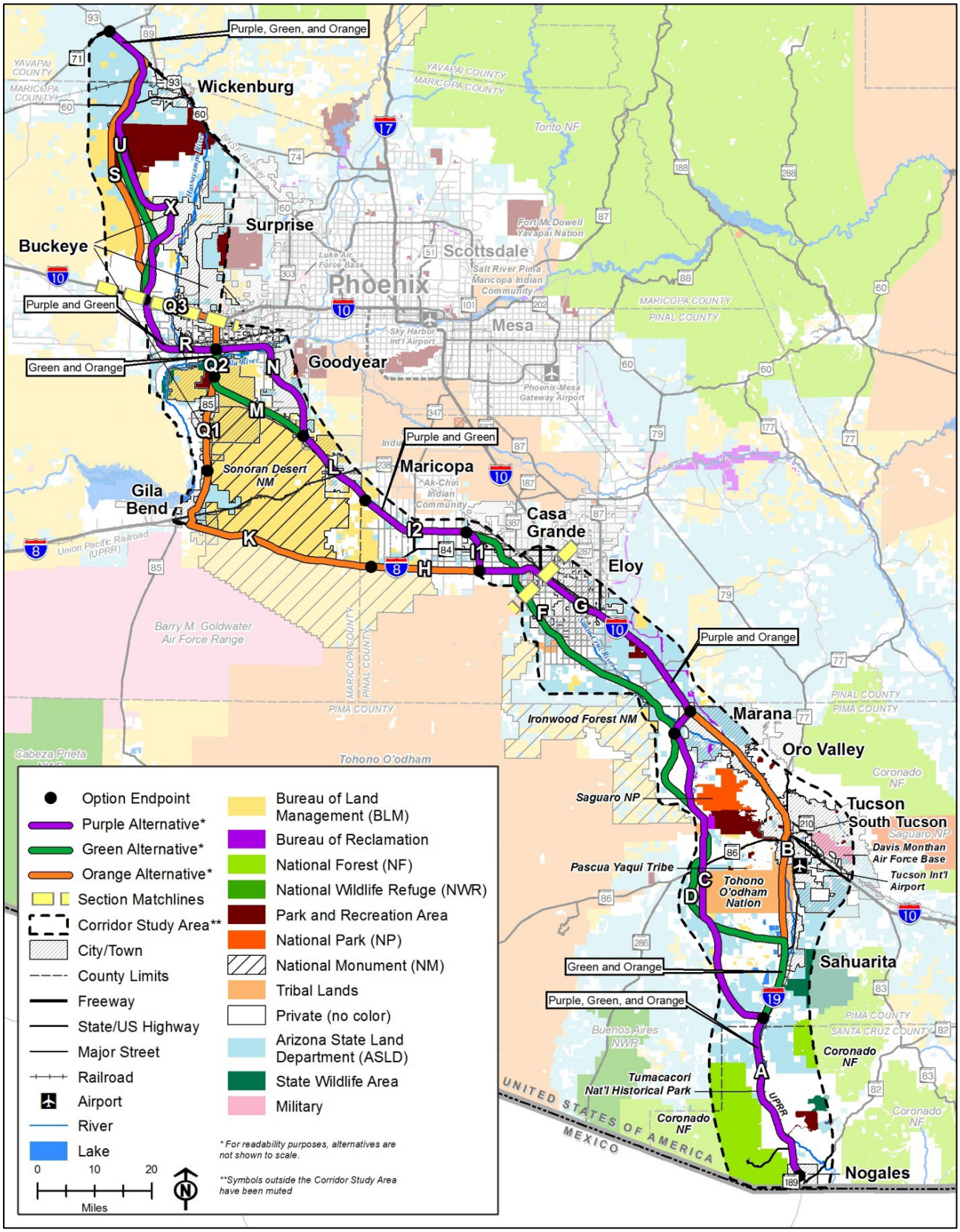


Figure 2-5 End-to-End Build Corridor Alternatives

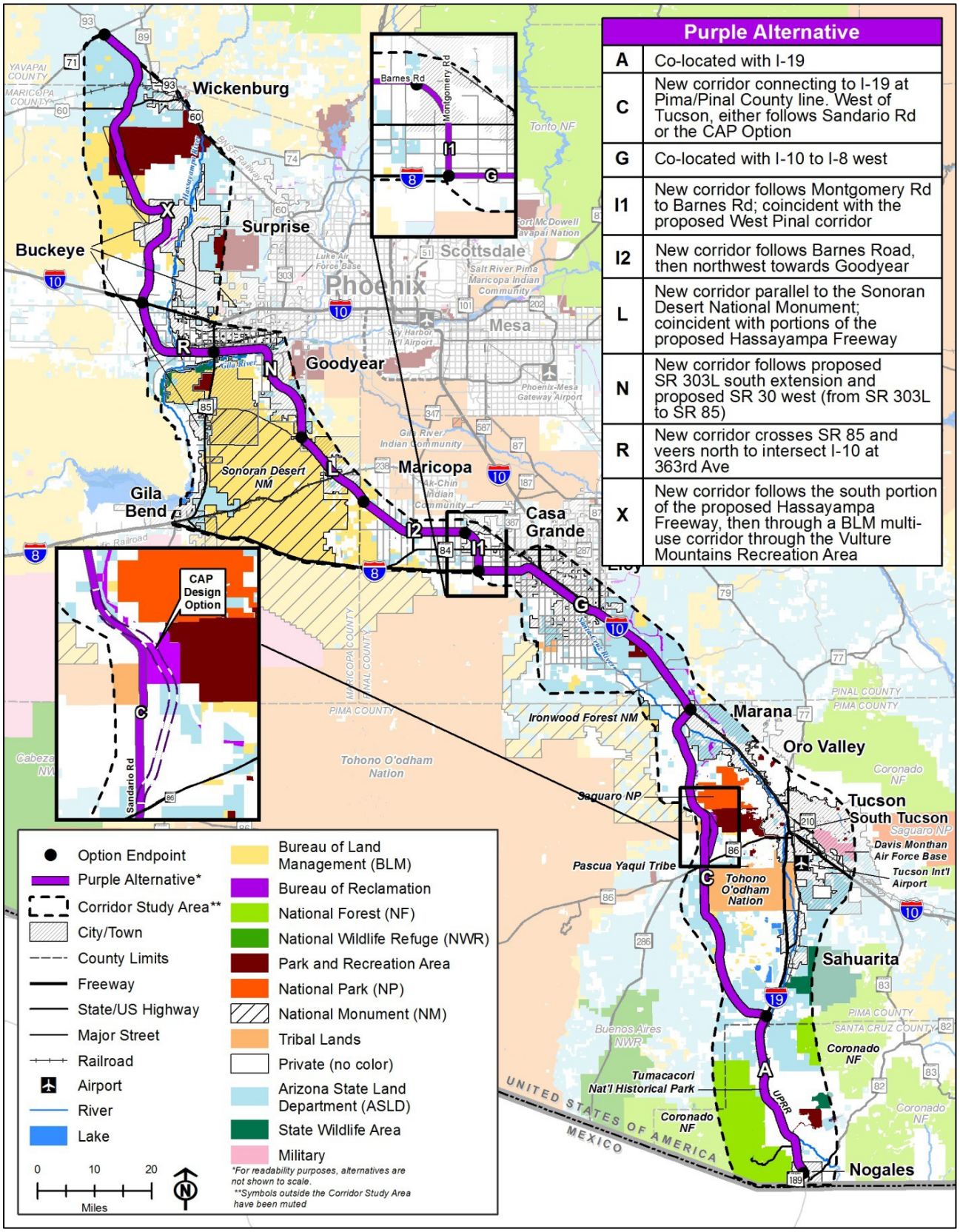


Figure 2-8 Build Corridor Alternative: Purple

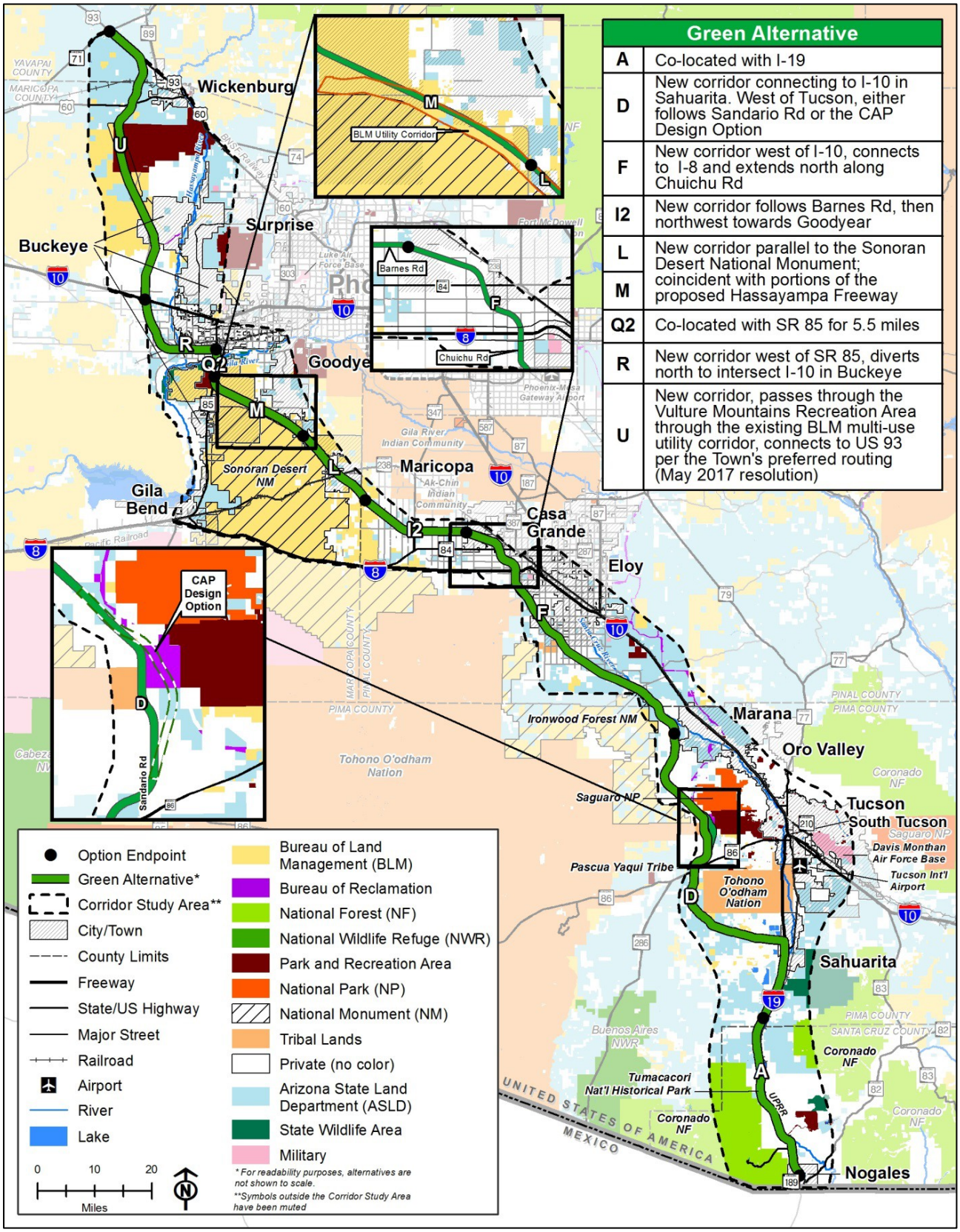


Figure 2-9 Build Corridor Alternative: Green

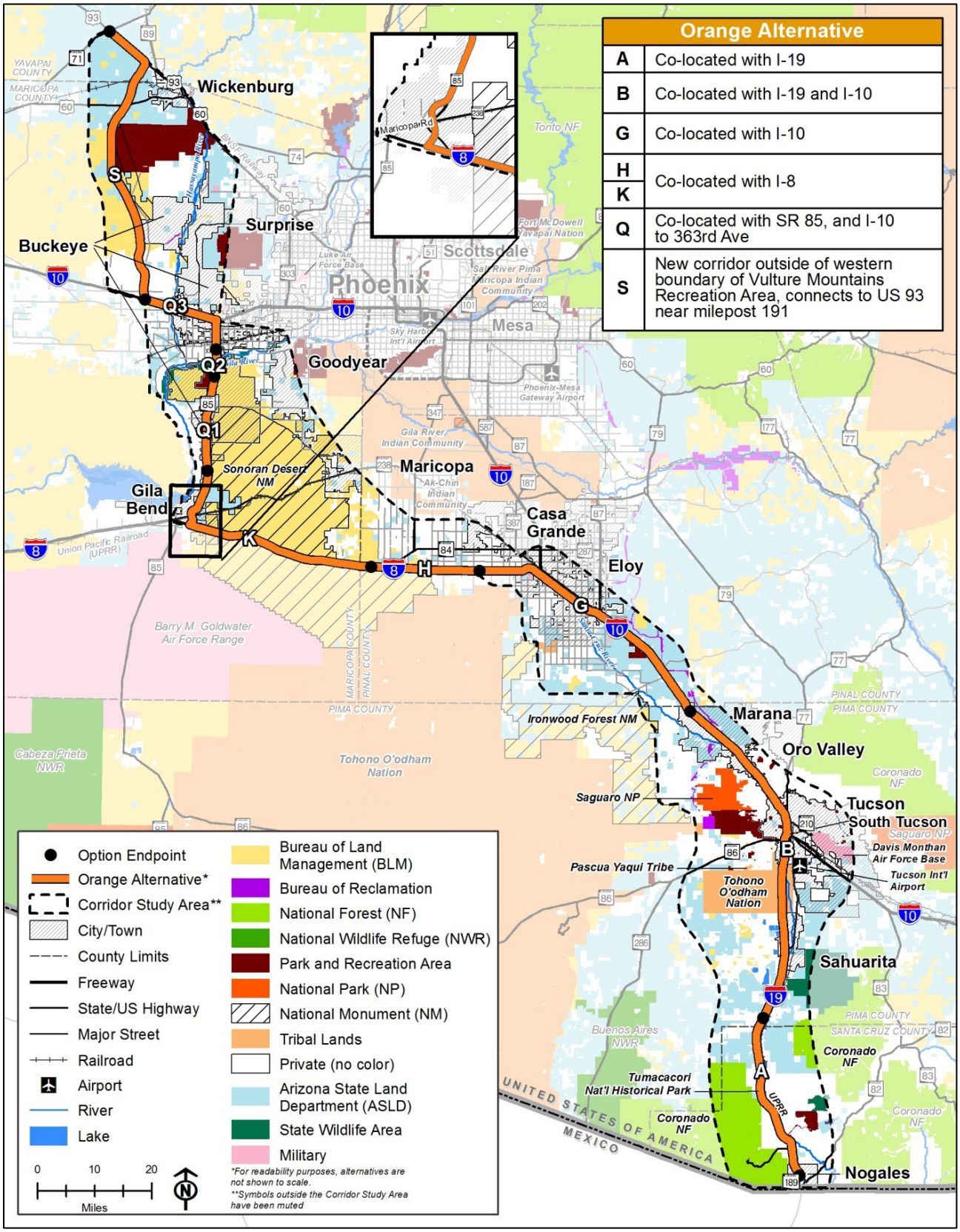
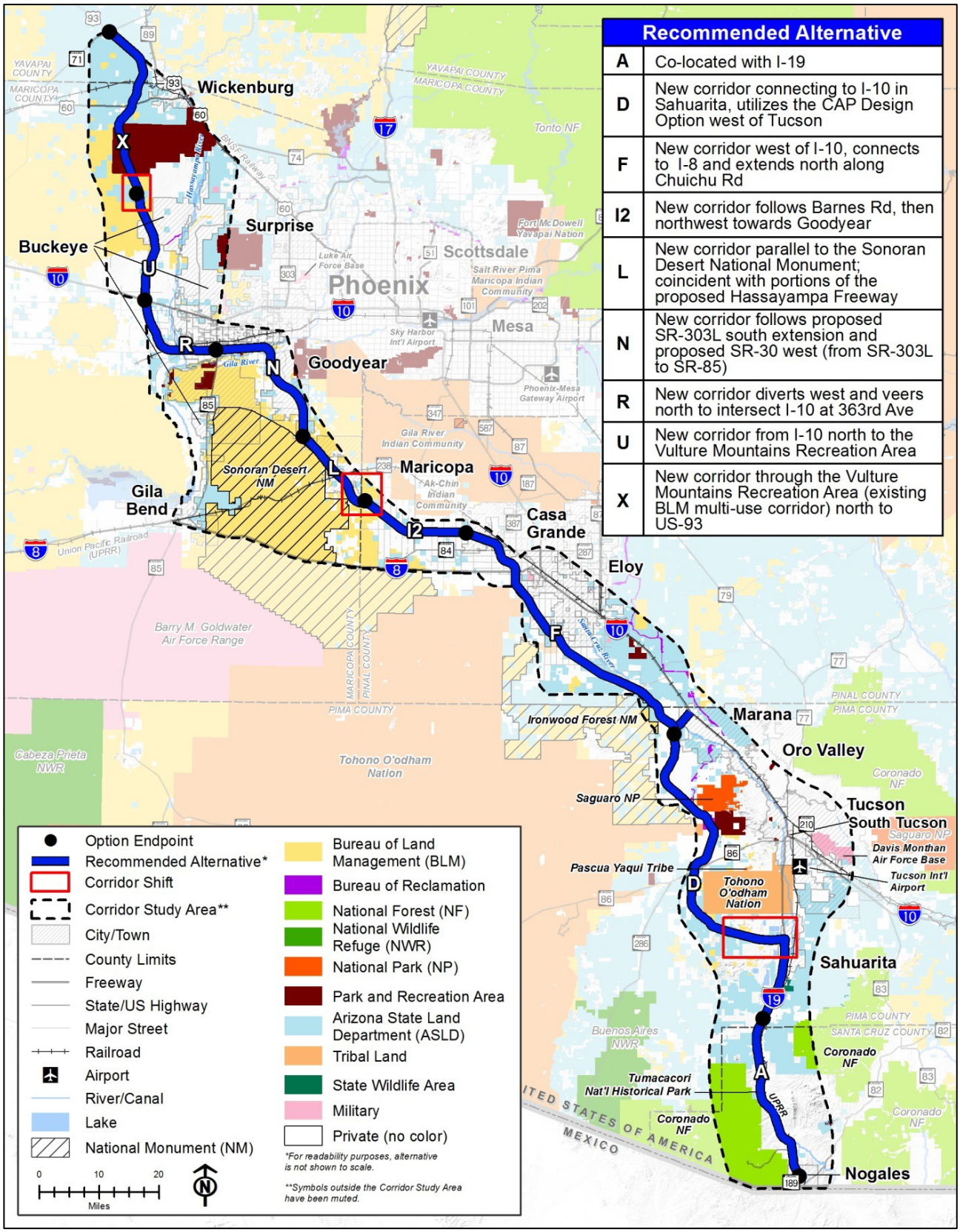


Figure 2-10 Build Corridor Alternative: Orange


Recommended Alternative
A Co-located with I-19
D New corridor connecting to I-10 in Sahuarita, utilizes the CAP Design Option west of Tucson
F New corridor west of I-10, connects to I-8 and extends north along Chuichu Rd
I2 New corridor follows Barnes Rd, then northwest towards Goodyear
L New corridor parallel to the Sonoran Desert National Monument; coincident with portions of the proposed Hassayampa Freeway
N New corridor follows proposed SR-303L south extension and proposed SR-30 west (from SR-303L to SR-85)
R New corridor diverts west and veers north to intersect I-10 at 363rd Ave
U New corridor from I-10 north to the Vulture Mountains Recreation Area
X New corridor through the Vulture Mountains Recreation Area (existing BLM multi-use corridor) north to US-93
Wickenburg
Buckeye
Surprise
Phoenix
Scottsdale
Mesa
Goodyear
Maricopa
Casa Grande
Eloy
Gila Bend
Marana
Oro Valley
Tucson
South Tucson
Sahuarita
Nogales
Option Endpoint
Recommended Alternative*
Corridor Shift
Corridor Study Area**
City/Town
County Limits
Freeway
State/US Highway
Major Street
Railroad
Airport
River/Canal
Lake
National Monument (NM)
Bureau of Land Management (BLM)
Bureau of Reclamation
National Forest (NF)
National Wildlife Refuge (NWR)
National Park (NP)
Park and Recreation Area
Arizona State Land Department (ASLD)
Tribal Land
State Wildlife Area
Military
Private (no color)
*For readability purposes, alternative is not shown to scale.
**Symbols outside the Corridor Study Area have been muted.
0 10 20
Miles

APPENDIX C: LETTER FROM THE MAYOR ON THE ADOT TIER 1 EIS

DRAFT

CITY OF BUCKEYE

MAYOR'S OFFICE

BUCKEYE, AZ

July 2, 2019

I-11 Tier 1 EIS Study Team
Arizona Department of Transportation
Attn: Jay Van Echo
1655 W. Jackson Street, MD 126F
Phoenix, AZ 85007

Re: I-11 Tier 1 EIS – City of Buckeye Preferred Alignment

Dear Mr. Van Echo:

The City of Buckeye has completed a review of the I-11 Draft Tier 1 Environmental Impact Statement (EIS) and has the following comments:

The EIS recommended (Blue) alignment (see attached exhibit A) will have detrimental impacts to several properties within the City of Buckeye Municipal Planning Area (MPA), and it is not consistent with several of the City's planning documents (2040 General Plan, Transportation Master Plan and Community Master Plan). The recommended corridor along the Hazen Road alignment has several major impacts to important existing facilities within the Buckeye MPA:

- It will be located very close (Within 0.5 miles) to Palo Verde Elementary School.
- It impacts two (2) different dairy farm operations.
- It will be located within close proximity (less than ½ mile) to existing subdivisions.
- It bisects multiple existing farms into two separate areas causing major impacts to farming operations.

As such, the City of Buckeye is not in support of the recommended (Blue) alignment.

Instead the City is in support of the (Purple) alignment with some modifications. North of I-10, the Purple Alignment most closely aligns with the Hassayampa Valley Transportation Framework Study (adopted February 2008). That study was previously completed by the Maricopa Association of Governments (MAG) and accepted by the city. The Purple alignment also best aligns with the City's vision for I-11 north of I-10, and is most consistent with the City's planning documents and entitled Community Master Plans (CMP's). In particular, the Purple alternate aligns closest with the approved Douglas Ranch CMP (See Exhibit B).

South of I-10, the Purple Alignment is also the City's preferred alignment; however, with a deviation in the Palo Verde area (331st Avenue to SR 85).

530 E. Monroe Ave. • Buckeye, Arizona 85326

Phone 623-349-6919 • Fax 623-349-6222 • www.buckeyeaz.gov

The City requests that ADOT consider an alternate alignment through this area. See Exhibit C.

Gila Alignment – A route along the north portion of the Gila River transitioning to the Hazen Road alignment near Rooks Road.

- This alignment does not cross the Buckeye Canal and will have minimal impacts on long standing regional irrigation facilities.
- This route would continue to provide access to the planned industrial components in this portion of the City.
- As it would be located closer to the river and the southern portion of the agricultural farming in the area, the freeway will not bisect multiple existing farms into two separate areas preventing major impacts to farming operations.
- It will provide flood protection for the adjacent properties allowing the land to become developable.
- It will also have minimal impacts to existing communities, as there are fewer structures within the suggested study area.

The City looks forward to working with the Arizona Department of Transportation (ADOT) and the Federal Highway Administration (FHWA) in the development of I-11 through Buckeye.

Thank you for considering our preferred corridor alignment of I-11 through Buckeye.

Sincerely,

Jackie Meck
Mayor, City of Buckeye

530 E. Monroe Ave. • Buckeye, Arizona 85326

Phone 623-349-6919 • Fax 623-349-6222 • www.buckeyeaz.gov

Exhibit A

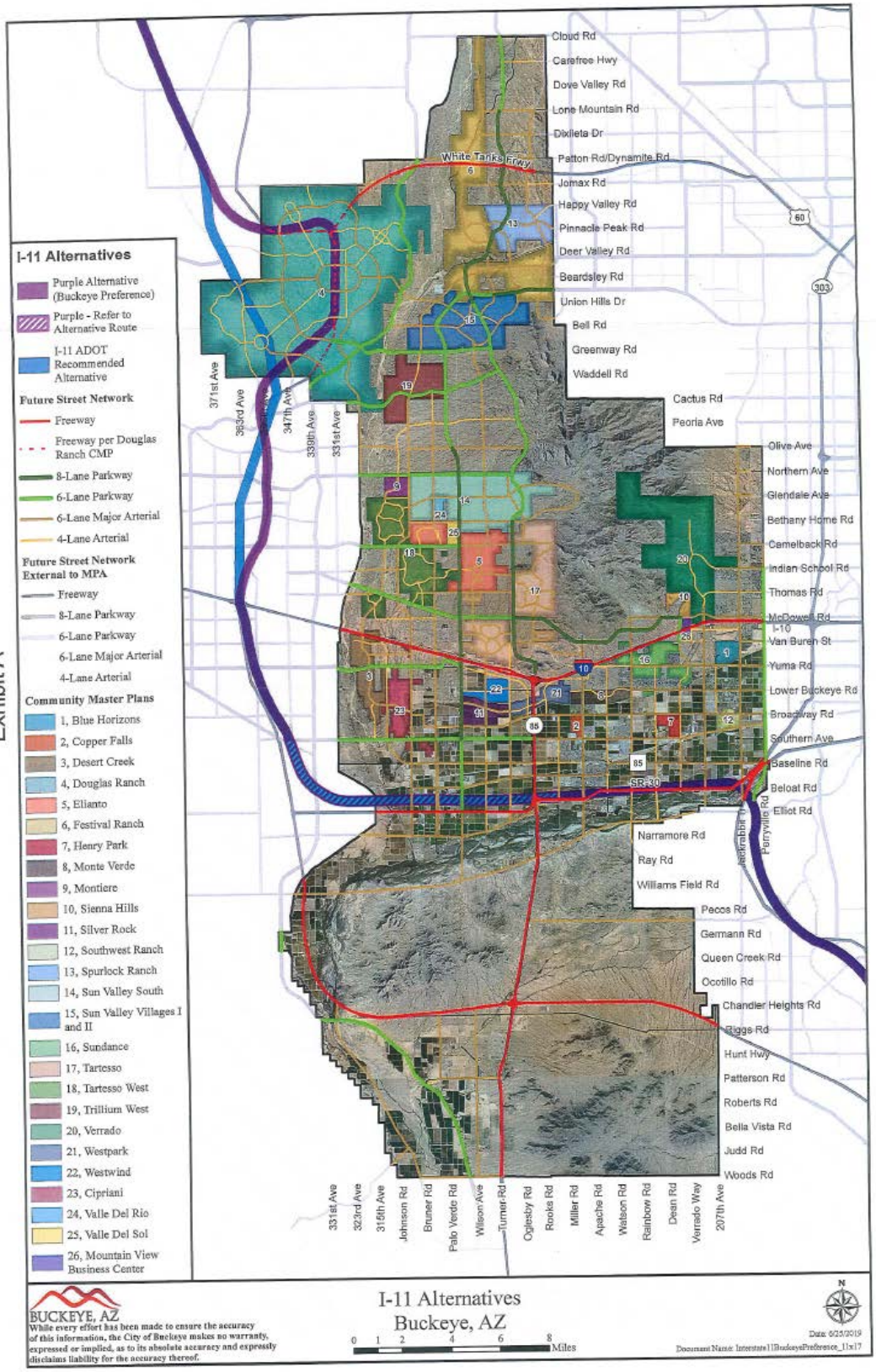

I-11 Alternatives
Purple Alternative (Buckeye Preference)
Purple - Refer to Alternative Route
I-11 ADOT Recommended Alternative
Future Street Network
Freeway
Freeway per Douglas Ranch CMP
8-Lane Parkway
6-Lane Parkway
6-Lane Major Arterial
4-Lane Arterial
Future Street Network External to MPA
Freeway
8-Lane Parkway
6-Lane Parkway
6-Lane Major Arterial
4-Lane Arterial
Community Master Plans
1, Blue Horizons
2, Copper Falls
3, Desert Creek
4, Douglas Ranch
5, Elliento
6, Festival Ranch
7, Henry Park
8, Monte Verde
9, Montiere
10, Sienna Hills
11, Silver Rock
12, Southwest Ranch
13, Spurlock Ranch
14, Sun Valley South
15, Sun Valley Villages I and II
16, Sundance
17, Tartesso
18, Tartesso West
19, Trillium West
20, Verrado
21, Westpark
22, Westwind
23, Cipriani
24, Valle Del Rio
25, Valle Del Sol
26, Mountain View Business Center
Cloud Rd
Carefree Hwy
Dove Valley Rd
Lone Mountain Rd
Dixileta Dr
Patton Rd/Dynamite Rd
White Tanks Fwy
Jomax Rd
Happy Valley Rd
Pinnacle Peak Rd
Deer Valley Rd
Beardsley Rd
Union Hills Dr
Bell Rd
Greenway Rd
Waddell Rd
Cactus Rd
Peoria Ave
Olive Ave
Northern Ave
Glendale Ave
Bethany Home Rd
Camelback Rd
Indian School Rd
Thomas Rd
McDowell Rd
I-10
Van Buren St
Yuma Rd
Lower Buckeye Rd
Broadway Rd
Southern Ave
Baseline Rd
Beloat Rd
Elliot Rd
Narramore Rd
Ray Rd
Williams Field Rd
Pecos Rd
Germann Rd
Queen Creek Rd
Ocotillo Rd
Chandler Heights Rd
Riggs Rd
Hunt Hwy
Patterson Rd
Roberts Rd
Bella Vista Rd
Judd Rd
Woods Rd
371st Ave
363rd Ave
347th Ave
339th Ave
331st Ave
331st Ave
323rd Ave
315th Ave
Johnson Rd
Bruner Rd
Palo Verde Rd
Wilson Ave
Turner Rd
Oglesby Rd
Rooks Rd
Miller Rd
Apache Rd
Watson Rd
Rainbow Rd
Dean Rd
Verrado Way
207th Ave
Paryville Rd
SR-30
BUCKEYE, AZ
While every effort has been made to ensure the accuracy of this information, the City of Buckeye makes no warranty, expressed or implied, as to its absolute accuracy and expressly disclaims liability for the accuracy thereof.
I-11 Alternatives
Buckeye, AZ
0 1 2 4 6 8 Miles
N
Date: 6/25/2019
Document Name: Interstate11BuckeyePreference_11x17

Exhibit B

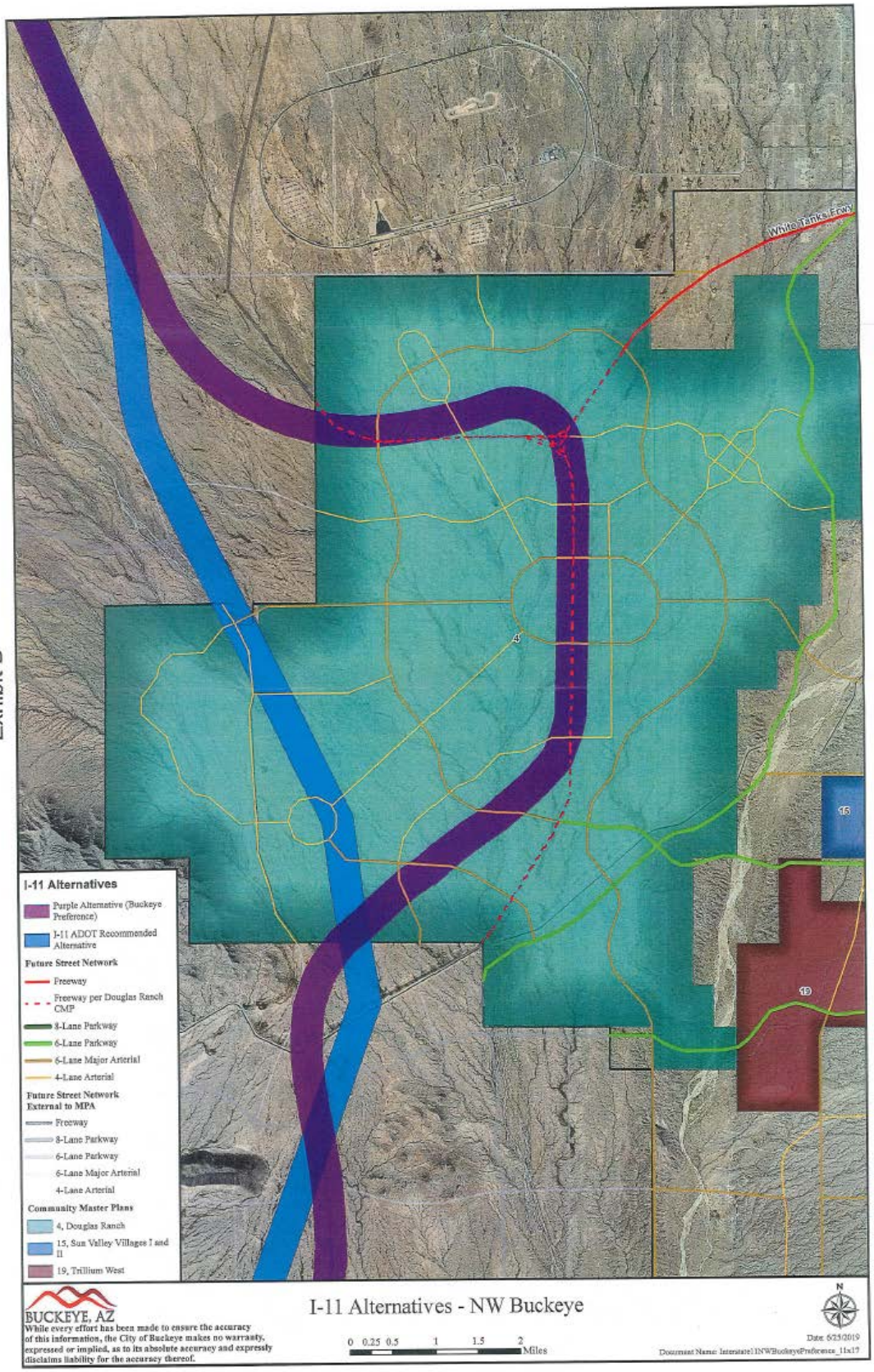
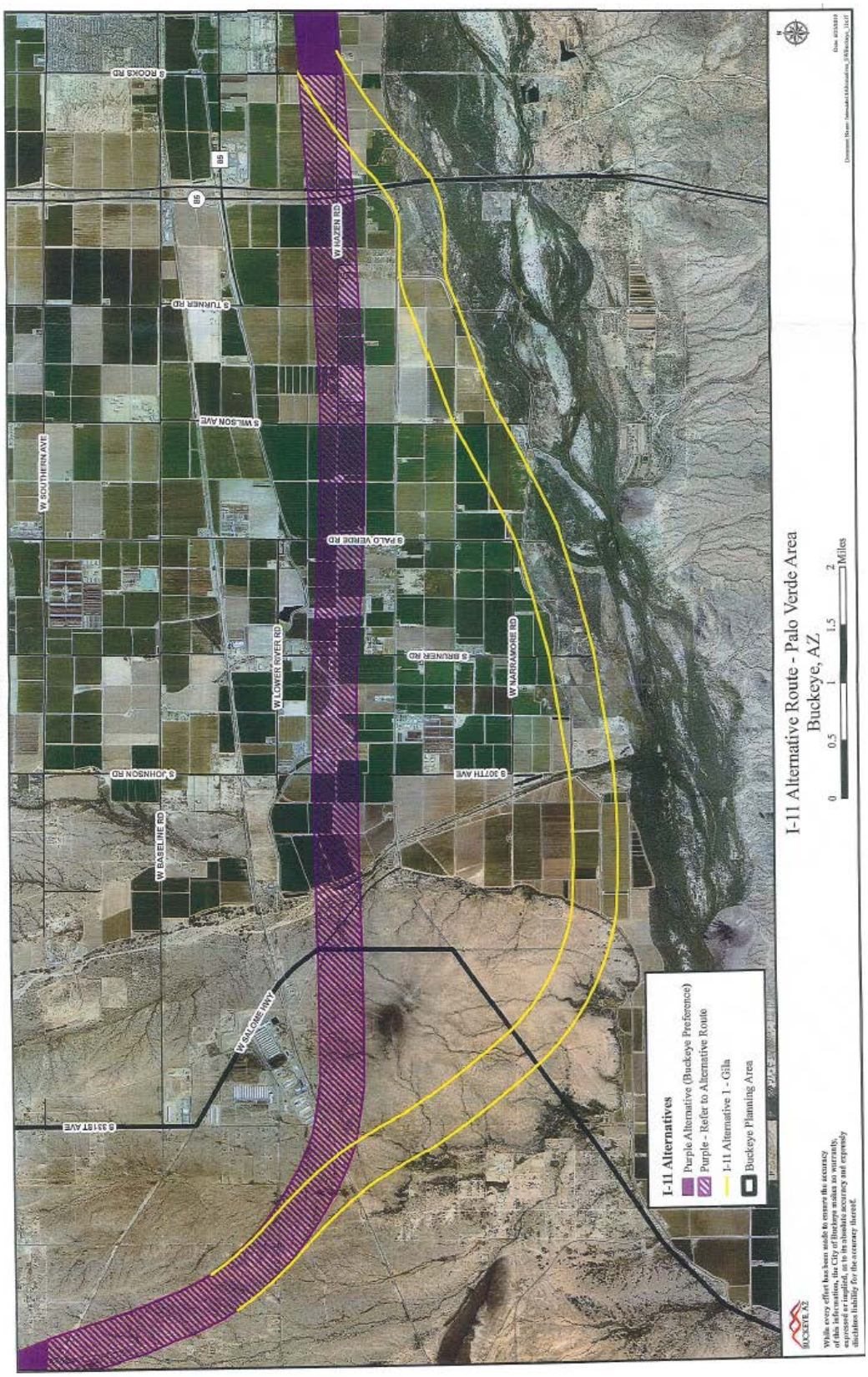
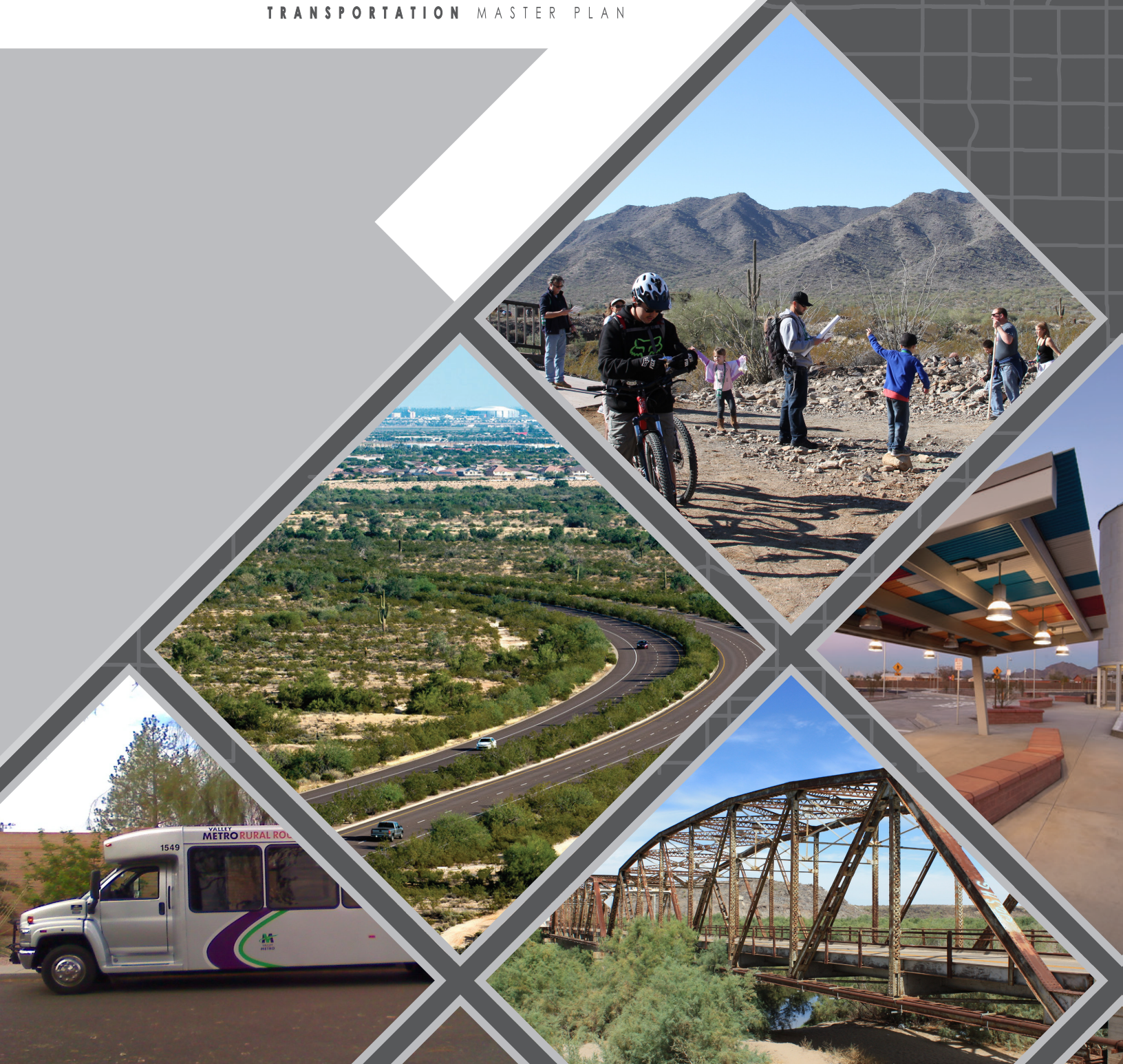

White Tanks Fwy
4
15
19
I-11 Alternatives
Purple Alternative (Buckeye Preference)
I-11 ADOT Recommended Alternative
Future Street Network
Freeway
Freeway per Douglas Ranch CMP
8-Lane Parkway
6-Lane Parkway
6-Lane Major Arterial
4-Lane Arterial
Future Street Network External to MPA
Freeway
8-Lane Parkway
6-Lane Parkway
6-Lane Major Arterial
4-Lane Arterial
Community Master Plans
4, Douglas Ranch
15, Sun Valley Villages I and II
19, Trillium West
BUCKEYE, AZ
While every effort has been made to ensure the accuracy of this information, the City of Buckeye makes no warranty, expressed or implied, as to its absolute accuracy and expressly disclaims liability for the accuracy thereof.
I-11 Alternatives - NW Buckeye
0 0.25 0.5 1 1.5 2 Miles
N
Date: 6/25/2019
Document Name: Interstate11NWBuckeyePreference_11x17

Exhibit C


I-11 Alternatives
Purple Alternative (Buckeye Preference)
Purple - Refer to Alternative Route
I-11 Alternative 1 - Gila
Buckeye Planning Area
I-11 Alternative Route - Palo Verde Area
Buckeye, AZ
0
0.5
1
1.5
2
Miles
W SAN DIMAS RD
W BASELINE RD
S JOHNSON RD
W LOWER RIVER RD
S PALO VERDE RD
W NARRAMORE RD
S 307TH AVE
S 331ST AVE
W SOUTHERN AVE
S WILSON AVE
S TUNNER RD
S ROOKS RD
W HAZEN RD
S BRUNER RD
BUCKEYE, AZ

BUCKEYE, AZ

BUCKEYE IN MOTION

TRANSPORTATION MASTER PLAN