



CITY OF AVONDALE

2017 TRANSPORTATION PLAN UPDATE

Prepared for

City of Avondale, Arizona

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executive summary

The Transportation Plan Update specifies policies, projects, and programs necessary to improve the community's transportation system over the next 25 years. It addresses transportation needs relative to the existing and future land use patterns in the City of Avondale Municipal Planning Area (MPA) to support economic development and enhance the quality of life for the area's residents, businesses, and visitors. It describes in detail the plan development process, foundational characteristics of the existing transportation system, programmed transportation improvements, and key assumptions related to future growth in the City's MPA that lead to development of alternative transportation network strategies and ultimately recommended improvements.

This Transportation Plan Update builds off previous planning efforts, specifically the initial Transportation Plan developed in 2006 and the subsequent 2012 Transportation Plan Update. It addresses changes in the characteristics of the existing transportation system as a result of projects implemented since adoption of the latest plan in 2012 and reviews the relevance of previous plan recommendations in the context of the current vision for future development within the City's MPA through Year 2040. Resulting recommendations for the future development of streets, transit services, bicycle facilities, and intelligent transportation systems (ITS) are provided to enable City staff and officials to most effectively prioritize the allocation of funds when programming transportation improvements projects.

The Transportation Plan Update was developed through the collaborative efforts of City staff and incorporates feedback from the Planning Commission, City Council, and the public. As with the previous plan update, this Plan promotes the vision of the City's General Plan 2030 to create a Healthy Sustainable Community. It provides both a framework for transportation infrastructure that supports continued growth of neighborhoods and businesses necessary for economic development and strategies for implementation of pedestrian and bicycle enhancements that allows the built environment to promote public health.

Strategies to support anticipated growth over the next 25 years were based on estimates of forecasted travel demand developed in conjunction with the Maricopa Association of Governments (MAG) regional travel demand model, and derived from adopted estimates of future population and employment within the City's MPA. Worth noting is that current estimates of population and employment are even lower than those forecasted in conjunction with the 2012 plan. Year 2030 forecasts of population are 23 percent lower in conjunction with this Transportation Plan Update than the 2012 plan, with a corresponding 52 percent decrease in forecasted employment growth. Year 2040 forecasts developed for this plan are nine percent lower in population and 37 percent lower in employment than the previous plan Year 2030 forecasts. While the current plan does not incorporate as an aggressive growth forecast as previous plans, it does still represent an approximate 40% increase in population and 90% increase in employment from today. In fact, the resulting Year 2040 forecasts represent approximately 50 percent buildout of the entire City MPA, but roughly 70 percent of buildout of the MPA north of Indian Springs Road



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The study team worked closely with City staff to adjust the geographical allocation of growth in the MPA based on the anticipated location of future development. The majority of the population growth is anticipated to occur in association with new residential development situated between Lower Buckeye Road and Indian Springs Road. Future employment growth is expected to develop along Interstate 10 (I-10) in the City's center and along the future planned State Route 30 (SR-30) freeway corridor in the south.

MAG's Regional Travel Demand Model (TDM) was used to estimate future travel demand in the MPA associated with the anticipated growth. An analysis was conducted to determine whether the existing transportation network, supplemented by programmed improvements, could adequately accommodate future development. This analysis led to recommendations for the sizing and connectivity of the street network to support the anticipated growth. The Recommended Street Plan is illustrated in Figure ES-1

The Recommended Street Plan, in conjunction with a review of proposed future land use types, was used to update the Truck Route Plan presented in the 2012 Transportation Plan. The resulting Recommended Truck Route Plan is illustrated in Figure ES-2. The Recommended Truck Route Plan continues to highlight preferred routes for commercial vehicle access to key commercial and industrial destinations, as well as connectivity to truck routes in adjacent communities.

The Transportation Plan Update also includes a Recommended Long-Range Transit Plan, which considers routes to serve both local and regional origins and destinations. Local recommendations include increased route frequency and new routes to serve developing areas. Provisions for incorporating regional service include potential corridor for express bus, high-capacity transit, and even commuter rail. The long-range transit vision, depicted in Figure ES-3, provides guidance for continued coordination with Valley Metro and other regional transit planning efforts.

Figure ES-4 illustrates the Recommended Bicycle Network. Recommendations were developed to promote bicycle connectivity between existing and future neighborhoods, activity centers, recreation opportunities, and bicycle routes in adjacent communities. Projects have been identified to fill gaps in bicycle network connectivity, as well as priority bicycle corridors associated with new roadways in developing areas. The Recommended Bicycle Network also highlights regional trails, which are also available for pedestrian use. Additionally, pedestrian travel is supported by inclusion of sidewalks in the City's standard street cross-sections, which support a citywide vision to become more multi-modal.

A comprehensive plan for implementation of Intelligent Transportation System (ITS) strategies was presented in the 2012 Plan Update, based on recommendations for the City's 2010 ITS Strategic Plan. These strategies, illustrated in Figure ES-5, remain relevant in the context of this current Plan Update and are, thus, carried forward. ITS strategies provide an alternative to more costly roadway expansion projects, affording additional capacity through technology that adjusts to real-time traffic conditions.

Planning-level cost estimates were developed for the various recommended improvements to the transportation system. In total, planning level estimates indicate a total cost of nearly \$238 million dollars (2017 dollars) to implement all of the recommended improvements. Given the realities of



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current funding levels, it is unlikely that all of the projects can be constructed. Therefore, the study team continues to work with City staff and other consultants to prioritize projects for inclusion in the ten year Capital Improvement Program (CIP).



Legend

Roadway Facility Type

- Arterial (6-lane)
- Arterial (5-lane)
- Arterial (4-lane)
- Arterial (3-lane)
- Collector (2-lane)
- Freeway
- Bridge
- River
- Avondale Focus Area
- Planning Area

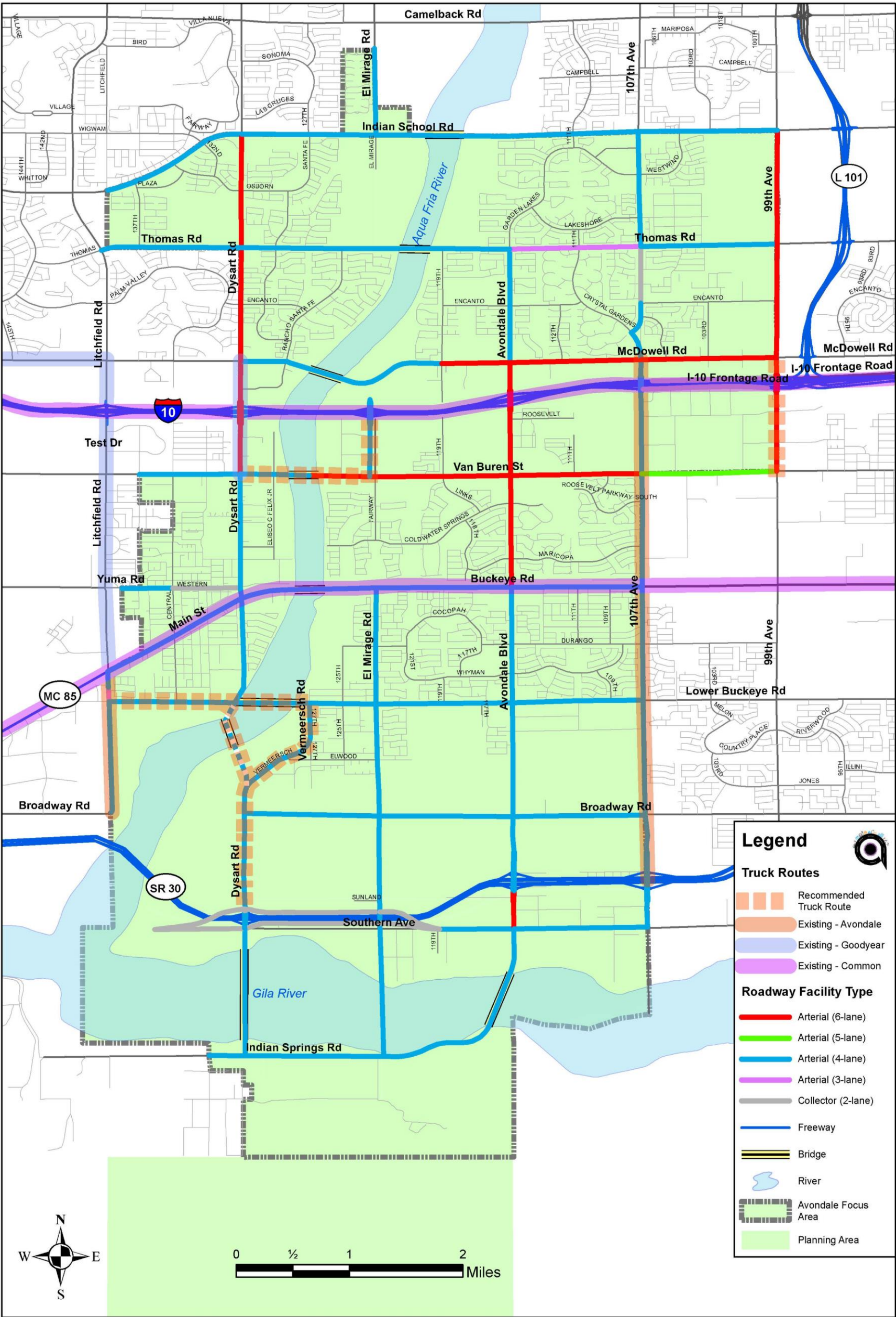
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Figure ES-2 Truck Route Plan



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.

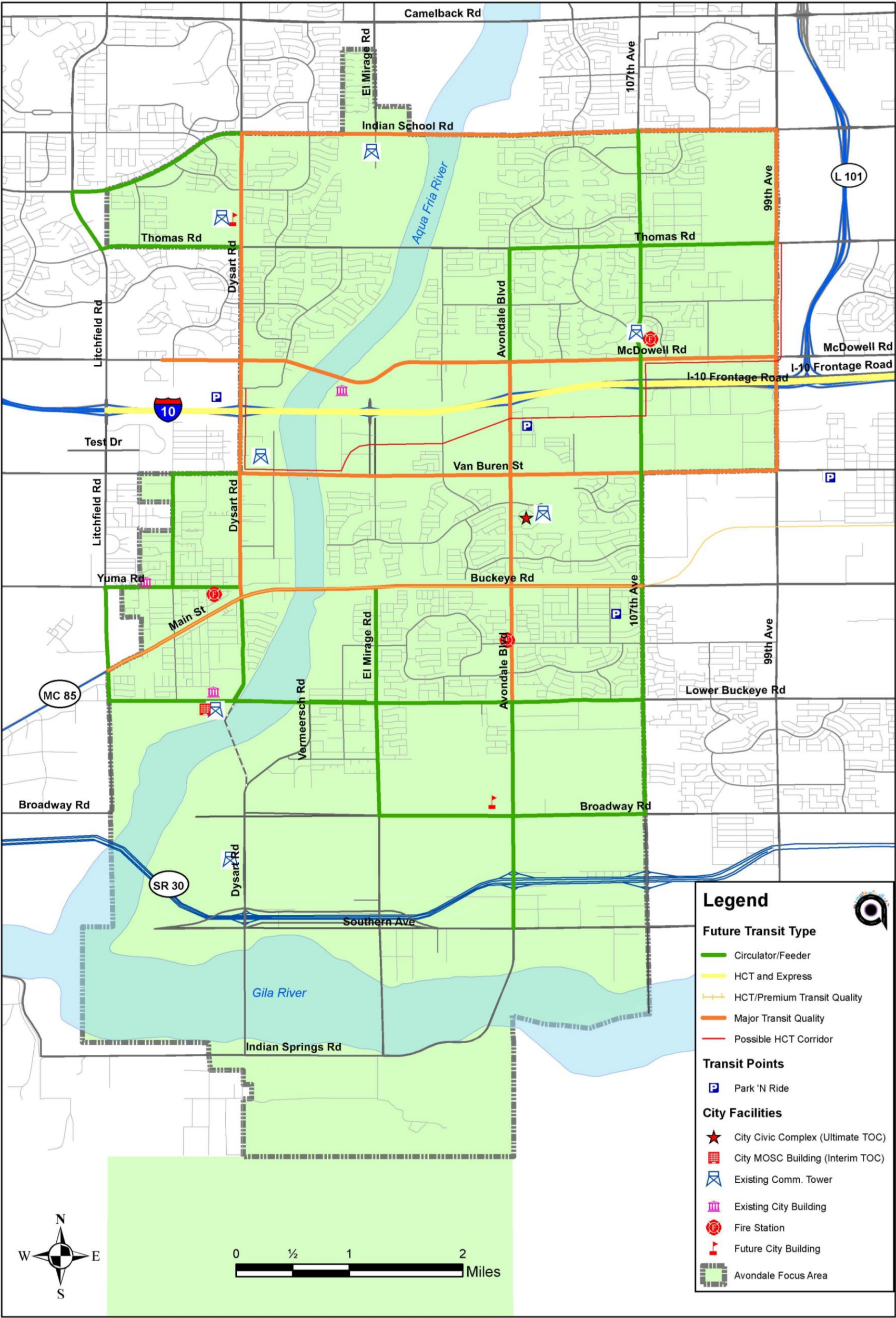




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Figure ES-3 Recommended Transit Plan



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.

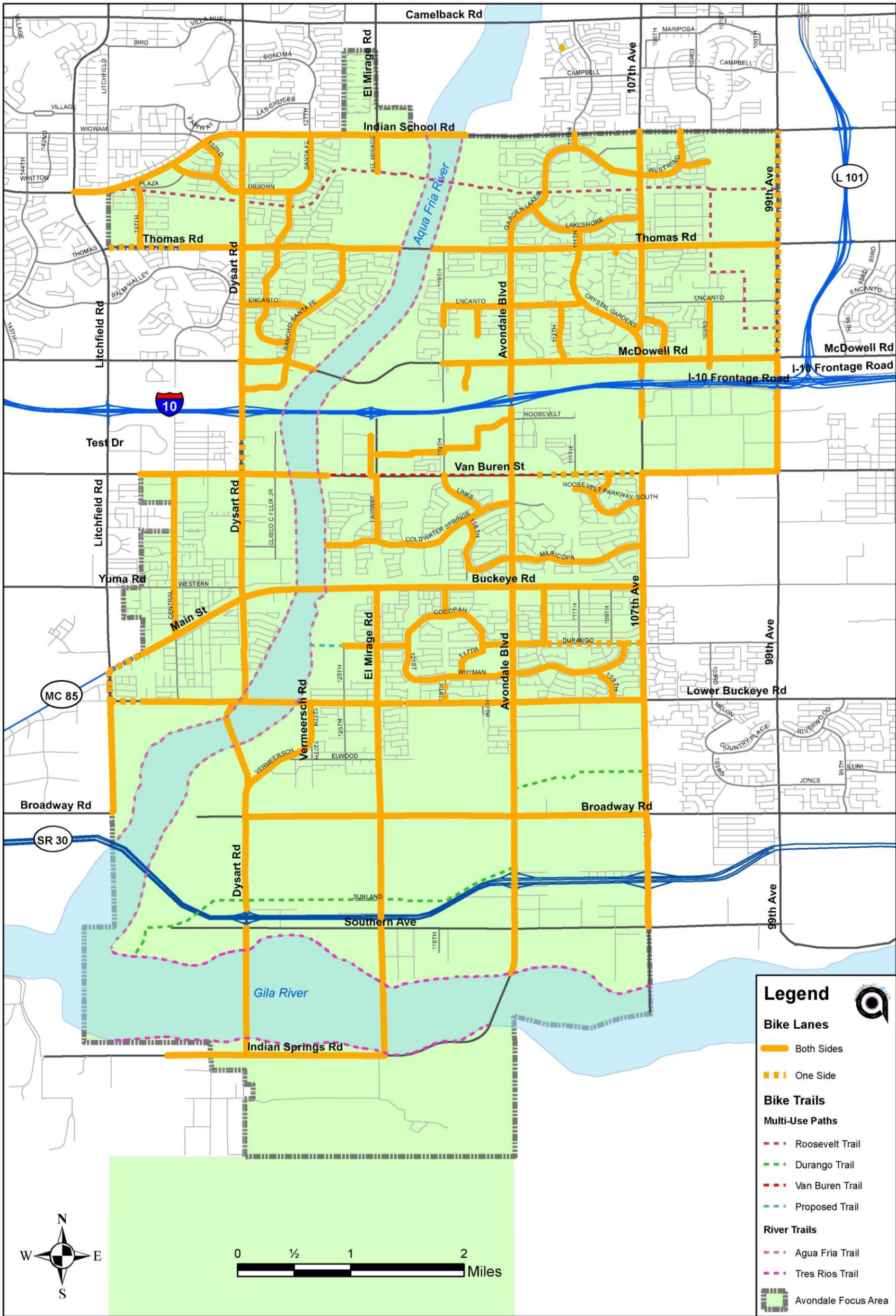




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Figure ES-4 Recommended Bicycle Network

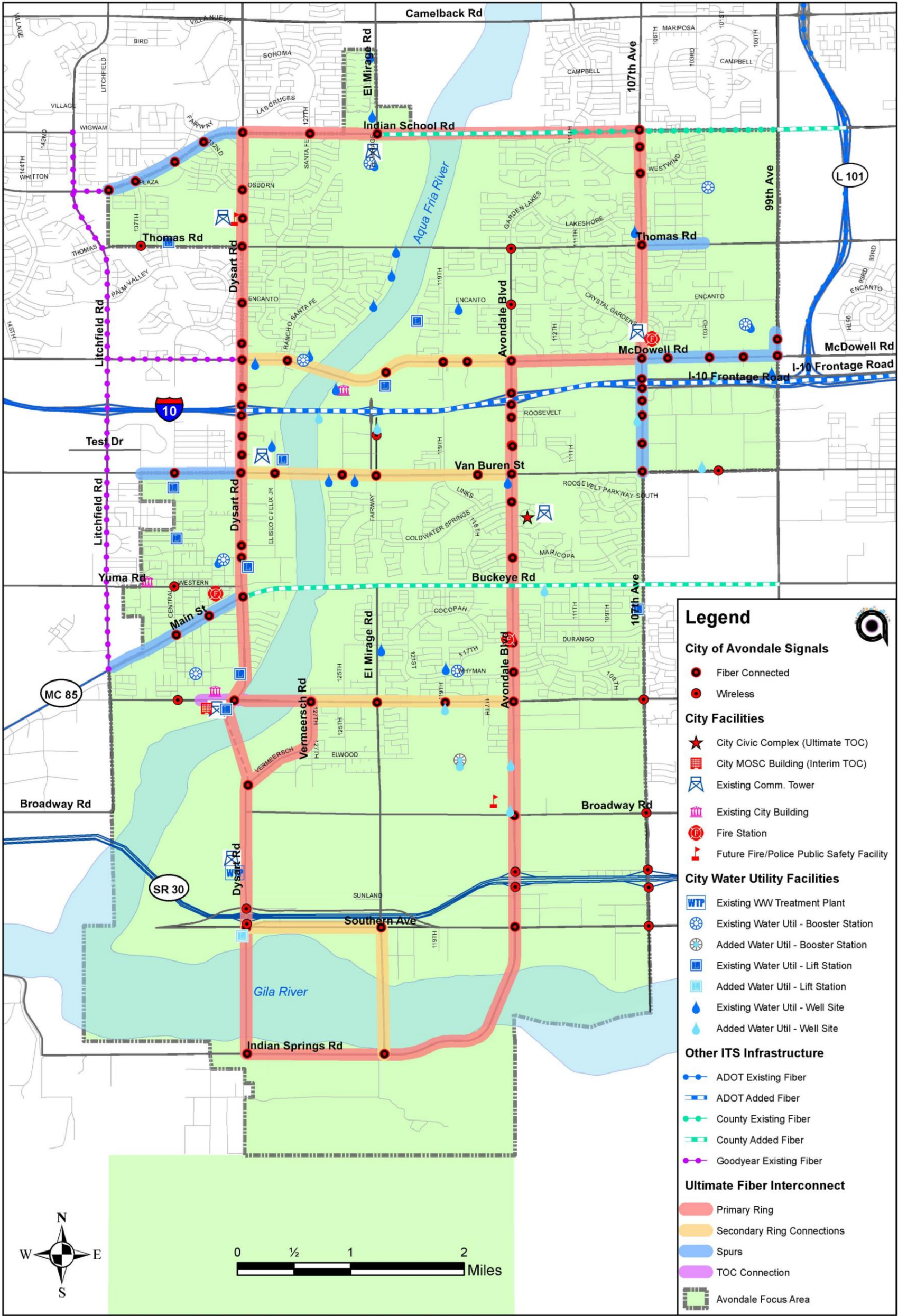




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Figure ES-5 Recommended ITS Plan



Note: Gray Dashed Lines Indicate alternative roadway alignments subject to future studies.





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1. introduction

This Transportation Plan Update provides a strategy for implementing multimodal transportation improvements over the next 25 years. Improvements are identified to accommodate anticipated growth within the City's municipal planning area (MPA), supporting economic development and enhancing the quality of life for residents, businesses, and visitors. It establishes long-range plans for future development of streets, transit services, bicycle facilities, and intelligent transportation systems (ITS). It also addresses funding needs relative to the implementation of recommended strategies.

This Transportation Plan Update represents an update to the previously adopted 2012 Transportation Plan Update. It addresses changes in the characteristics of the existing transportation system as a result of projects implemented since adoption of the plan in 2012. It also reviews the relevance of previous plan recommendations in the context of the current vision for future development within the City's MPA through Year 2040 and presents a refined set of recommendations relative to this vision.

As with the previous plan update, this Transportation Plan Update promotes the vision and guiding principles of the City's General Plan 2030 to create a healthy sustainable community. It provides both a framework for transportation infrastructure that supports continued growth of neighborhoods and businesses necessary for economic development and strategies for implementation of pedestrian and bicycle enhancements that allows the built environment to promote public health.

The Transportation Plan Update was developed through the collaborative efforts of City staff and incorporates feedback from the Planning Commission, City Council, and the public. Strategies to support anticipated growth over the next 25 years were based on estimates of forecasted travel demand developed in conjunction with the Maricopa Association of Governments (MAG) Regional Travel Demand Model (TDM), and derived from adopted estimates of future population and employment within the City's MPA.

purpose

The Transportation Plan Update provides recommended improvements to transportation infrastructure and services over the next 25 years. It serves to inform the programming of near- and mid-term projects in the City's 10-year Capital Improvement Program (CIP), and long-term strategies will provide guidance to future developments.

study area

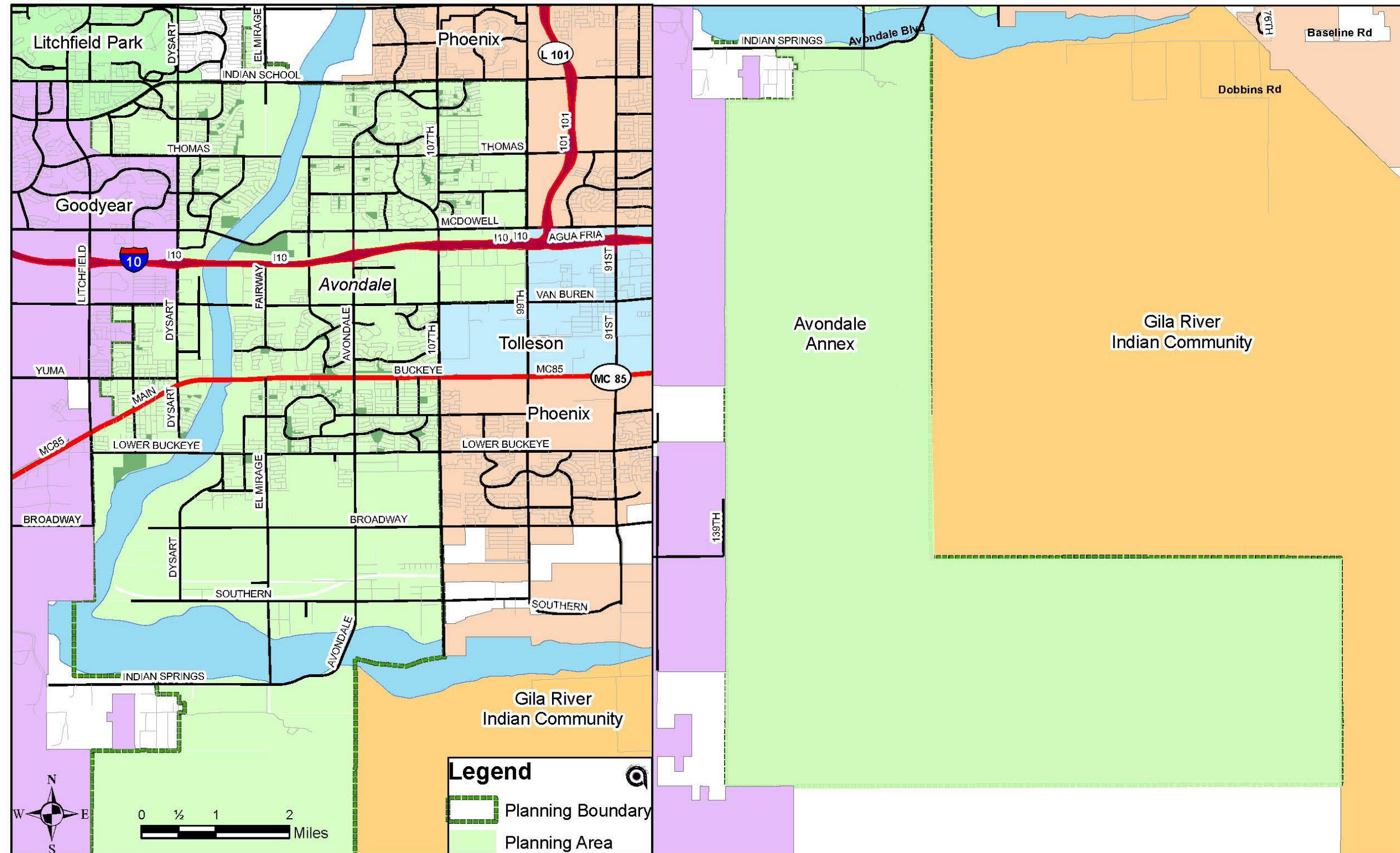
The City's MPA is roughly bounded by Indian School Road in the north, Litchfield Road and Dysart Road in the west, 99th Avenue and 107th Avenue in the east, and extends far south, wrapping around the Estrella Mountain Regional Park and Gila River Indian Community, as depicted in Figure 1.1. Forecasted growth in the MPA over the next 25 years, however, is anticipated to occur in the portion of the MPA located north of the Estrella Mountains. Therefore, the study area defined for this Plan terminates approximately one mile south of Indian Springs Road.



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Figure 1.1 Transportation Plan Update Study Area





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report organization

This Transportation Plan Update has been organized into the following chapters:

Chapter 1: Introduction – provides the context for the Plan Update and introduces the Plan purpose, study area and report organization.

Chapter 2: Plan Development Process – describes foundational elements that guided development of the plan, including goals and objectives, previously identified key issues, programmed improvements within the study area, and stakeholder and public engagement.

Chapter 3: Land Use and Socioeconomic Conditions – documents existing and future land use assumptions, in terms of population and employment, which contribute to the growing demand on the transportation network.

Chapter 4: Street Plan – describes the characteristics of the existing street network and the anticipated ability of the network to respond to forecasted future traffic volumes resulting from future development, investigates alternatives to enhance local travel and regional connectivity, and provides a recommended future roadway network and associated improvements to accommodate anticipated growth.

Chapter 5: Transit Plan – provides an overview on the City's existing transit system and identifies recommended projects and policies to enhance transit services.

Chapter 6: Bike Plan – documents existing bicycle facilities in the study area and presents recommendations to provide a more comprehensive non-motorized transportation network to promote a healthy community.

Chapter 7: Intelligent Transportation System Strategic Plan – reiterates the relevant aspects of the previous ITS strategies presented in the 2012 Transportation Plan Update, which was based on the Intelligent Transportation Systems (ITS) Strategic Plan that was completed separately in July 2010.

Chapter 8: Funding – provides planning level costs associated with the identified improvements and identifies potential funding sources.

Chapter 9: Recommendations and Implementation Strategies – summarizes the recommendations and implementation strategy documented in preceding chapters.



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2. plan development process

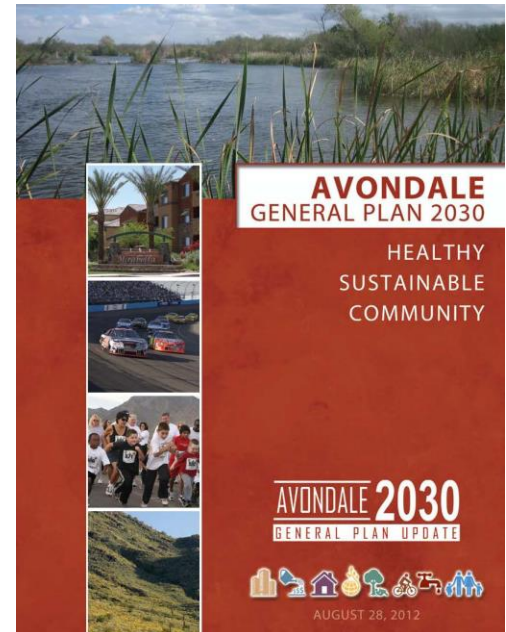
This section describes foundational elements that guided development of the Plan, including goals and objectives, programmed improvements within the study area, and stakeholder and public engagement.

goals and objectives

This Transportation Plan Update promotes the vision and guiding principles of the City's General Plan 2030 to create a healthy sustainable community. The General Plan 2030 emphasizes Community Mobility through the following goals associated with its Circulation, Bicycle, and Transit Oriented Development (TOD) elements:

mobility element

- ✓ Provide a transportation system that is complementary to the existing and planned land uses.
- ✓ Promote Avondale in regional transportation issues.
- ✓ Provide a transportation system that serves the public in a safe, efficient, and cost-effective manner.
- ✓ Promote and support an integrated transportation system that mitigates congestion, fosters a sense of community, and preserves the environment.



bicycle element

- ✓ Develop a safe bicycle transportation system that provides connectivity throughout the City, including major public and private facilities, and to transit.
- ✓ Continue to make the street system accessible, safe, and convenient for bicycles and pedestrians.
- ✓ Increase recreational opportunities for bicyclists throughout Avondale.
- ✓ Become a recognized bicycling friendly city.

transit oriented development element

- ✓ Enhance public transit options for residents of Avondale.
- ✓ Require development and redevelopment within areas designated as TOD on the General Plan 2030 land use map to facilitate and encourage the use of transit by visitors and residents.



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- ✓ Promote and support the incorporation of commercial uses as a component of TOD.
- ✓ Promote and support the incorporation of healthy community design criteria into TOD development.

In light of these overarching General Plan 2030 goals, a series of individual objectives were established for this Transportation Plan Update, as follows:

- ✓ Define the existing state of the transportation system for all modes (cars, trucks, transit, bicycles, and pedestrians).
- ✓ Estimate future conditions with anticipated growth in population and employment through 2030 & 2040.
- ✓ Document deficiencies in both the existing and future transportation network for all modes (cars, trucks, transit, bicycles, and pedestrians).
- ✓ Identify applicable projects from the previous 2012 Transportation Plan and other appropriate modifications to address identified needs.
- ✓ Develop an implementation plan for recommended multi-modal transportation improvements.
- ✓ Communicate with the public and stakeholders to assure their input to this Transportation Plan Update.

key issues

The 2006 Transportation Plan identified a series of key issues affecting the City's transportation system: rapid population growth, rising traffic congestion, and new developments. While the current economy has begun to recover from the recent economic recession, these issues are not currently as relevant as they were in 2006. However, these issues merit consideration when developing recommended transportation improvement strategies over this current Plan's 25-year planning horizon. The subsequent 2012 Transportation Plan Update also introduced a series of additional key issues that emerged as a result of the General Plan 2030 initiative: economic development, multimodal options, preserving transportation infrastructure, and the concept of complete streets. Each of these key issues remains relevant in the context of this current Transportation Plan Update.

economic development

Economic development remains an important focus in achieving the General Plan 2030 vision for a Healthy Sustainable Community. Current development has capitalized on the presence of Interstate 10 (I-10) and State Route 101L (SR-101L), which provide regional connectivity to the City's key employment and activity centers. These routes will continue to serve as an impetus to new development, particularly with the addition of the new I-10 interchange at Fairway Drive. Equally important to the economic vitality of the City is the grid network of arterial streets which provide residents access to key activity centers. As the City continues to develop toward the southern portion of its MPA, a similar network of regional routes and local arterials will be required to facilitate



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economic development in these developing areas. The future SR-30 facility, a component of MAG's current transportation program, will play a similar role to that which I-10 plays in the northern portion of the City's MPA. Enhancements to the connecting arterial grid in this developing portion of the MPA will be equally important, particularly as they provide opportunities to connect to existing activity centers in the northern portion of the MPA and future opportunities to even longer term development in the southernmost portion of the MPA south of the Estrella Mountains. To that end, the Transportation Plan Update considers options for enhanced connectivity across the Agua Fria and Gila rivers.

multimodal options

Multimodal connectivity between neighborhoods and key activity centers and recreation areas is vital to the General Plan 2030 vision for a Healthy Sustainable Community. The Plan, therefore, considers opportunities to improve and expand linkages between residential and commercial development, parks, schools, and open spaces. This can be achieved through a combination of dedicated trails and the incorporation of alternate modes within the context of the street network – a concept known as "Complete Streets." MAG developed a Complete Streets Guide in 2011 which provides a toolbox of strategies to implement complete streets within its member communities, ensuring that pedestrians, bicycles, and transit are accommodated to the extent possible relative to the context of the surrounding area. The City's current standard street cross sections incorporate both bicycle and pedestrian modes.

Furthermore, the goals of the General Plan 2030 TOD Element, cited earlier, foster the linkage between land use plans and alternate mode opportunities. The densities and mix of uses associated with TOD promote walkability, cycling, and access to transit, which all foster healthier lifestyles, while minimizing congestion of the City's street system.

preserving transportation infrastructure

Today's fiscal realities require communities to make wise investments in their transportation infrastructure. It has become increasingly important to make investments to maintain and maximize the efficiency of existing systems. The Complete Streets concept provides a framework for enhancing person throughput on existing routes through integrated designs accommodating alternative travel modes, specifically automobile, bicycle, pedestrian, and transit. Increased vehicle throughput on existing facilities can often be accomplished through implementation of ITS improvements that allow traffic signals to be more responsive to ever changing traffic conditions. Ultimately, an appropriate balance must be achieved between investments in infrastructure expansion (new roadways) and preservations and modernization of existing transportation facilities.

programmed improvements

Currently programmed transportation improvements provide a foundation for the identification of the vision for the future transportation system. Therefore, a review of the City's CIP and Maricopa County Department of Transportation's (MCDOT) Transportation Improvement Program (TIP) was conducted



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to identify the timeframe for planned improvements to the City's transportation network. A summary of identified improvements is provided in Table 2.1. In addition, MAG's RTP provides guidance on programmed regional facilities. Developer driven projects associated with the City's development impact fee (DIF) program (identified separately), should also be considered, though more tentatively, as the timing is linked to the timing of the associated development. The timing and need for these improvements will be evaluated in the analysis of future Year 2030 and Year 2040 traffic conditions to determine their continued applicability in addressing the demand of future growth within the study area.



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Table 2.1 FY2017-FY 2027 Capital Improvement Plan – Transportation Related Projects

CIP ID #	Location	Description	Cost	Fiscal Year(s)
Development Fee Ineligible Construction Projects – Citywide				
ST1007	Citywide	Street Drainage Issues	\$1,000,000	2017-2027
ST1009	Citywide	Citywide Street Overlay	\$18,000,000	2017-2027
ST1012	Citywide	Bridge Repairs	\$375,000	2017-2027
ST1020	Citywide	Preventative Street Maintenance	\$18,000,000	2017-2027
ST1162	Citywide	CDBG Street and Sidewalk Improvements	\$3,890,000	2017-2027
ST1220	Citywide	Pedestrian Ramp/Sidewalks Program	\$2,050,000	2017-2027
ST1294	Citywide	ITS Fiber Backbone Program	\$450,000	2017-2020
ST1164	Citywide	Streetlight Replacement Program	\$1,950,000	2019-2027
Development Fee Ineligible Construction Projects				
ST1328	McDowell Road – Avondale to Dysart	ITS Improvements	\$925,000	2017-2018
ST1362	Dysart Road – Van Buren to I-10	ITS Improvements	\$295,100	2017-2018
ST1386	MC85 at El Mirage Road	Install street lighting to accompany MCDOT sidewalk installation	\$150,000	2017-2018
PK1408	Van Buren – Agua Fria to 113 th Avenue	Construct multi-use path	\$2,483,260	2017-2019
ST1365	Dysart at Rancho Santa Fe	Construct safety improvements	\$1,000,000	2017-2020
ST1382	McDowell Road at 107 th Avenue	Construct dual left-turn lanes	\$500,000	2018-2019
ST1275	Western – Central to 4 th Avenue	Reconstruction	\$800,000	2018-2020
ST1380	Roosevelt Parkway at 99 th Avenue	Reconstruction	\$300,000	2019-2020
ST1309	MC85 – Litchfield to Agua Fria Bridge	Rehabilitation	\$1,370,000	2019-2021
ST1311	Washington – Dysart to 9 th Street	Reconstruction	\$700,000	2020-2021
ST1265	Dysart Road at McDowell Road	Install dual left-turn lanes	\$2,600,000	2020-2022
ST1172	El Mirage – Lower Buckeye Road to Calle Hermosa	Widen west side of roadway	\$810,000	2023-2027

Projects listed in the above table are subject to change pending results of this Plan update. See Table 8.2a for the final CIP project list.



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Table 2.1 FY2017-FY 2027 Capital Improvement Plan – Transportation Related Projects (continued)

CIP ID #	Location	Description	Cost	Fiscal Year(s)
ST1383	Broadway and Avondale Boulevard	Install traffic signal	\$1,000,000	2023-2027
Development Fee Eligible Projects				
ST1381	Maricopa Street and Avondale Boulevard	Install traffic signal	\$475,000	2017-2018
ST1224	107 th Avenue at McDowell	Widen south side of McDowell Road west of 107 th Avenue to provide 6-lane arterial section. Widen west side of 107 th Avenue south of McDowell Road to provide a 4-lane minor arterial section.	\$1,900,000	2017-2019
ST1336	Fairway Drive – Van Buren Street to I-10	Construct 5-lane section	\$3,820,000	2017-2022
ST1181	107 th Avenue and Roosevelt	Install traffic signal	\$475,000	2018-2019
ST1125	Avondale Boulevard – McDowell to Thomas	Half street improvement to widen from 3 lane to 5 lane roadway	\$1,700,000	2019-2021
ST1021	Dysart Road – Lower Buckeye to Harrison	Extend Dysart Road as 3- lane roadway	\$2,500,000	2020-2022
ST1127	107 th and Pierce	Install traffic signal	\$475,000	2021-2022
ST1166	Avondale Boulevard – Lower Buckeye to Miami	Widen east half of roadway	\$800,000	2021-2022
ST1170	Avondale Boulevard and Lower Buckeye	Install traffic signal and associated intersection improvements	\$600,000	2021-2022
ST1171	El Mirage and Lower Buckeye	Install traffic signal and associated intersection improvements	\$575,000	2021-2022
ST1146	Van Buren Street – 121 st to Fairway Drive	Widen north side to arterial standards	\$1,500,000	2023-2027
ST1187	119 th Avenue and McDowell	Install traffic signal	\$475,000	2023-2027
ST1188	119 th Avenue and Lower Buckeye	Install traffic signal	\$475,000	2023-2027
ST1189	107 th and Lower Buckeye	Install traffic signal	\$200,000	2023-2027
ST1195	Central and Lower Buckeye	Install traffic signal	\$475,000	2023-2027
ST1248	Dysart Road and Lower Buckeye Road	Install traffic signal	\$475,000	2023-2027

Projects listed in the above table are subject to change pending results of this Plan update. See Table 8.2a for the final CIP project list.



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Table 2.1 FY2017-FY 2027 Capital Improvement Plan – Transportation Related Projects (continued)

CIP ID #	Location	Description	Cost	Fiscal Year(s)
ST1331	107 th Avenue – Van Buren to Buckeye	Improve to 4-lane arterial	\$5,600,000	2023-2027
ST1332	107 th Avenue – Van Buren to I-10	Improve to 4-lane arterial	\$5,600,000	2023-2027
ST1333	Litchfield Road – Lower Buckeye to Broadway	Improve to major arterial	\$4,500,000	2023-2027
ST1334	Van Buren – 107 th Avenue to Avondale Boulevard	Improve to major arterial	\$6,000,000	2023-2027
ST1349	Van Buren Street and 103 rd Avenue	Install traffic signal	\$475,000	2023-2027
MCDOT Transportation Improvement Program Projects				
T490	107 th Avenue and Lower Buckeye	Install Traffic Signal	\$400,000	2017
Programs and Studies				
ST1329	Citywide	Development Impact Fee Update	\$25,000	2017-2018
ST1350	Citywide	Strategic Transportation Safety Plan	\$216,600	2017-2018
ST1406	Citywide	Safe Routes to Schools Program	\$286,000	2017-2020
PK1029	Citywide	Multi-modal Trail System	\$11,400,000	2017-2027
PK1219	Citywide	Parks, Recreation and Trails Master Plan	\$135,000	2023-2027

Projects listed in the above table are subject to change pending results of this Plan update. See Table 8.2a for the final CIP project list.



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3. land use and economic conditions

The City of Avondale is located in the West Valley region of the metropolitan area within Maricopa County. It was incorporated in December, 1946, and encompasses approximately 94 square miles total today. This Transportation Plan Update, however, addresses primarily a focus area of about 50 square miles located in the most northern portions of the City. The continual growth of Avondale necessitates the reevaluation of land use and socioeconomic conditions in order to accurately plan for a future transportation network mobility that is safe, reliable, and efficient.

land use

Land use development and transportation system design are interconnected planning efforts that are codependent on the function of the other. Without adequate access, land will remain undeveloped. Similarly, if the existing transportation network is not improved systematically over time then it will not be able to sustain the level of land use growth in the future. The effective implementation of a transportation network is largely dependent on the balance it has with surrounding land use conditions. From the City's General Plan 2030, land usage in the focus area of Avondale is depicted in Table 3-1 on the following page.

Historically, Avondale has largely been regarded as a bedroom community with agricultural roots. From the previous transportation plan however, the residential land share increased by 23% as well as the employment/industrial land share, which increased by over 5%. Given the redistribution of land use indicated by the current General Plan 2030, ensuring the proficiency of the transportation network is essential to sustaining the City's growth and transition from a suburban commuter community to a more self-reliant city.

demographic data

Socioeconomic conditions within a city play a significant role in determining the efficacy of the transportation system. Future socioeconomic projections provide insight for effective transportation planning and project prioritization. According to the MAG Regional Transportation Plan (RTP) – Draft 2017 Update, the City of Avondale continues to grow and attract new residents. Currently, the City's resident population is ranked 10th in incorporated areas within the metropolitan planning area, according to 2015 population data. Since 2010, Avondale's population has increased by 3% and is currently projected to grow by approximately 40% through horizon year 2040 – ranking 15th in municipal growth and 18th in overall regional growth. Table 3-2 on the following page summarizes the existing socioeconomic conditions for population, employment, and dwelling unit data within the City and provides projections of future growth based on MAG's 2040 adopted socioeconomic datasets.



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Table 3.1 General Plan 2030 Land Uses (Focus Area)

Land Use Description	Percentage Share
Residential (sum of subcategories)	48.35%
<i>Rural Low Density Residential</i>	5.45%
<i>Low Density Residential</i>	5.37%
<i>Medium Density Residential</i>	30.88%
<i>Medium High Density Residential</i>	3.05%
<i>High Density Residential</i>	2.75%
<i>Urban Residential</i>	0.31%
<i>Townhouse Residential</i>	0.25%
<i>Residential Mixed Use</i>	0.30%
Urban Commercial	0.66%
Local Commercial	3.67%
Neighborhood Commercial	0.14%
Freeway Commercial	3.60%
Historic Avondale District	0.43%
Sports and Entertainment	4.74%
Office	0.39%
High Intensity Office	0.55%
Industrial	2.12%
Mixed Use/Business	4.08%
Gateway Employment: Retail-Office-Hotel	0.41%
Employment	3.02%
Employment Mixed Use	0.86%
Corporate Park	0.97%
Gila River Scenic District	0.66%
Open Space	21.26%
Public/Civic	1.47%
Public Facilities	2.62%
Total	100.00%

Source: City of Avondale General Plan 2030.



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Table 3.2 City of Avondale Planning Area Socioeconomic Data

Demographic	2015	2030	2040	% Change 2015 - 2040
Resident Population	80,329	95,177	111,836	39%
Employment	17,667	25,377	33,505	90%
Dwelling Unit	27,620	32,021	38,451	39%

Source: MAG 2040 adopted socioeconomic dataset.

MAG projections in 2030 for resident population as well as employment both represent a decrease from the previous projections for the same horizon year cited in the previous transportation plan: the 2030 resident population projection decreased by 23% and the 2030 employment projection decreased by 52%. However, while these projections indicate less growth than previously anticipated, the employment growth rate continues to outpace the population growth through the 2040 horizon year.

Furthermore, areas of socioeconomic growth anticipated in the 2030 and 2040 horizon years span the City's entire study area. Population increase projections through 2040 indicate that areas in the southern portion of the focus area and north of the future SR-30 freeway will experience the greatest growth per square mile as well as the area in the northwest corner of the I-10/Loop 101 system interchange. There is also a fair amount of population growth occurring along the I-10 corridor to the south. Figure 3-1 illustrates the population increases per square mile through the 2040 horizon year.

Similarly, projected increases in dwelling units per square mile mimic the population growth map above. Figure 3-2 illustrates the areas within the City with the highest anticipated dwelling unit growth per square mile.

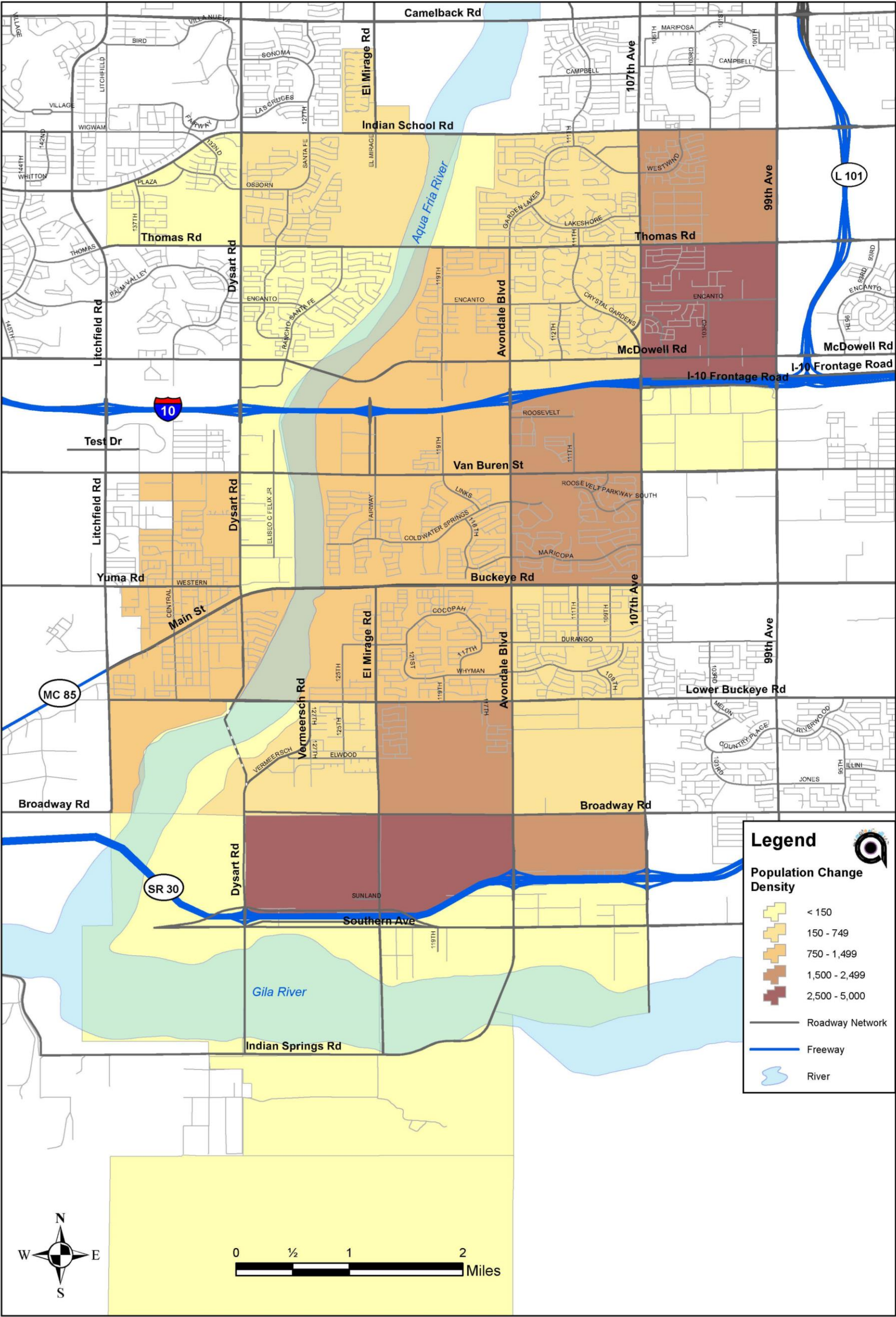
As previously mentioned, the employment growth rate outpaces the population growth rate through the 2040 horizon year. This is particularly significant because it indicates the City will no longer primarily exist as a suburban community with commuter traffic. This trend further suggests the City will produce more internal traffic as well as have increased potential for attracting regional traffic. The areas with the greatest employment increases per square mile are along the I-10 corridor to the south as well as the northeast portion of the planning/focus area, near the I-10/Loop 101 system interchange. Not only are these areas highest in density for employment growth, but from Figures 3-1 and 3-2, these areas will also experience high dwelling unit and population growths per square mile indicating that these areas will produce high levels of traffic overall. The employment growth per square mile is depicted in Figure 3-3.



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Figure 3.1 Projected Population Increases through Year 2040



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.

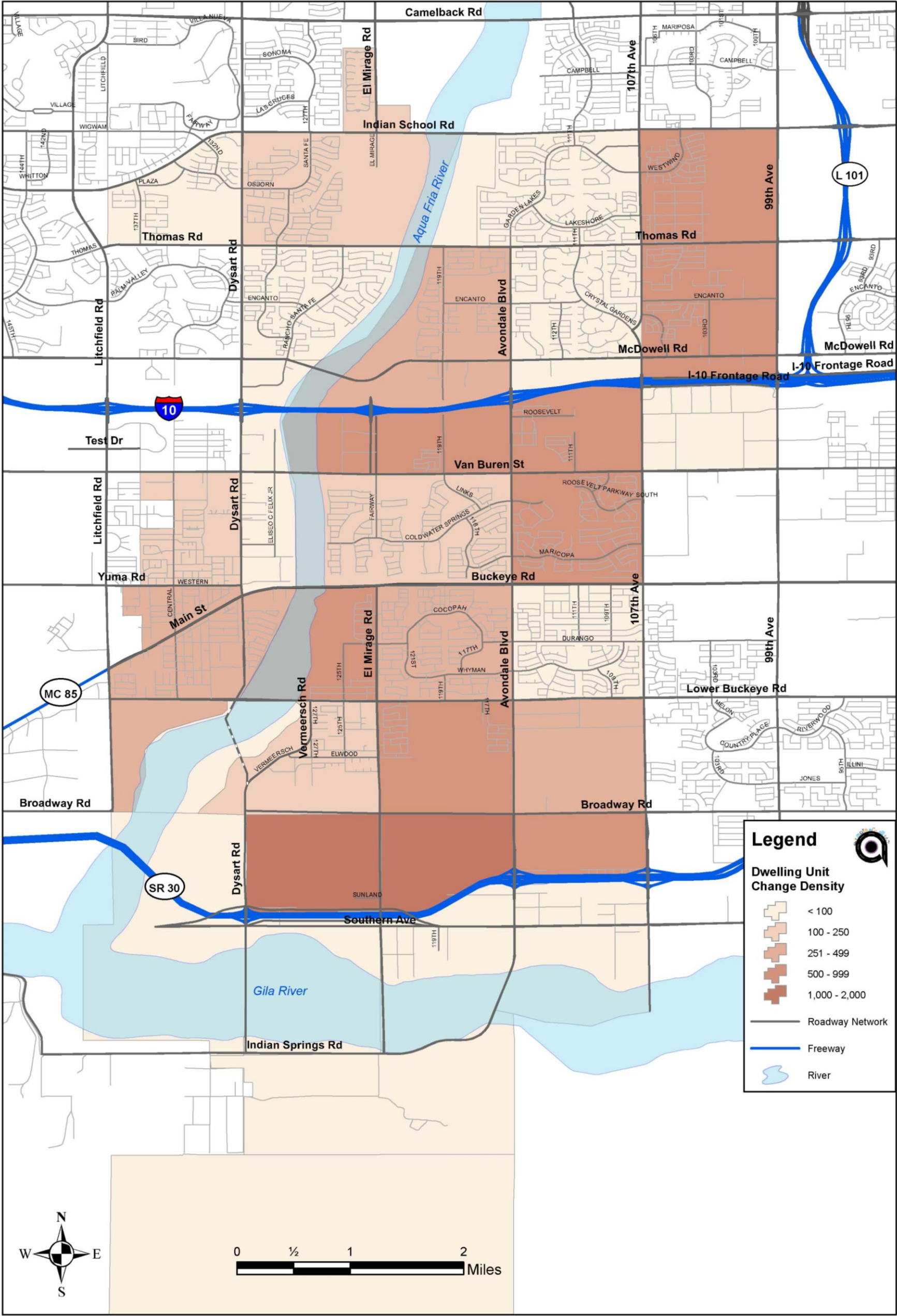




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Figure 3.2 Projected Dwelling Units Increases through Year 2040



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.

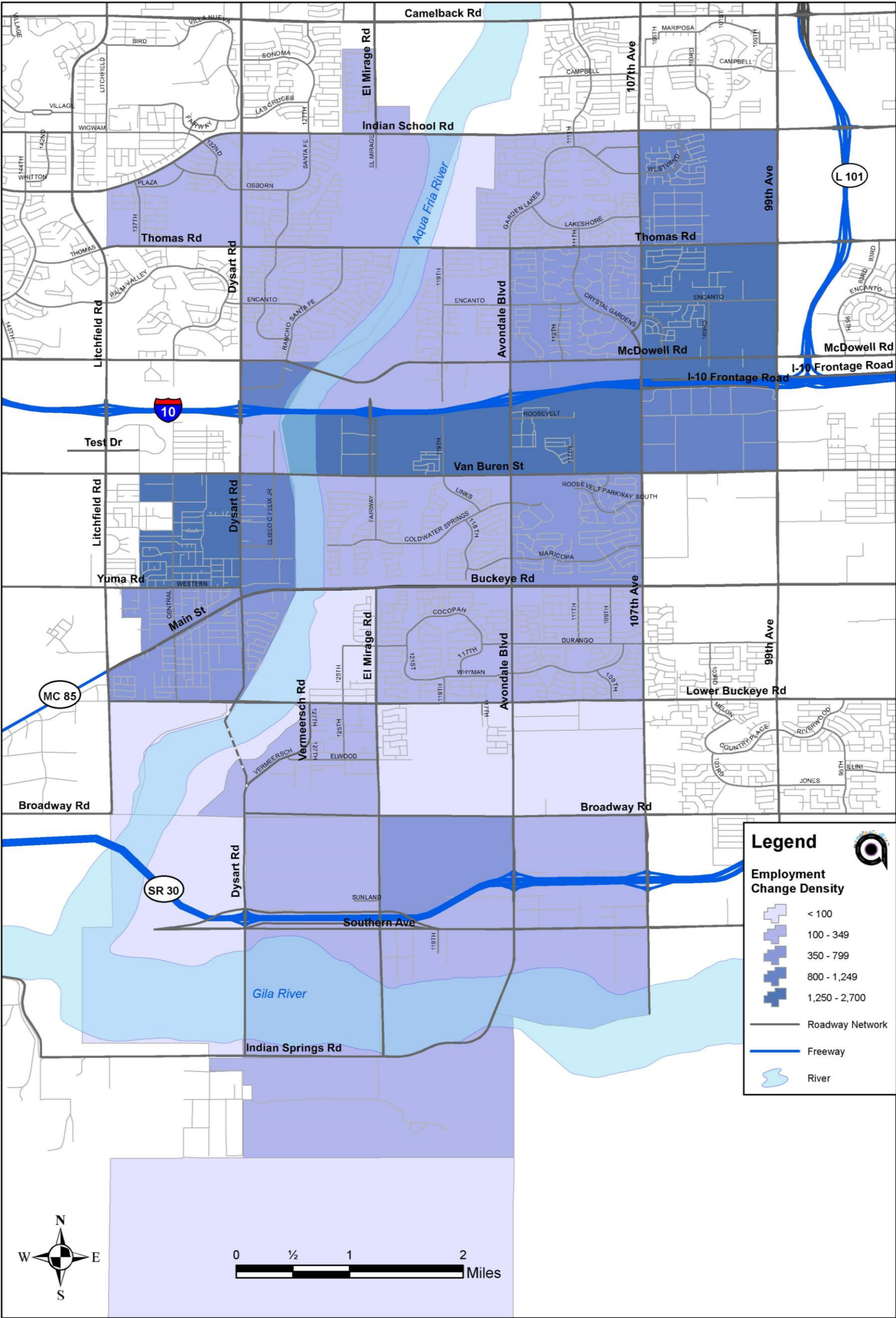




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Figure 3.3 Projected Employment Increases through Year 2040



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.





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4. street plan

This chapter identifies the strategy designed for the City to implement a future roadway network that provides effective mobility as well as sustains the anticipated growth indicated by the aforementioned socioeconomic projections. In addition to the City's existing roadway network, this chapter discusses the travel demand model used to attain traffic forecasts for horizon years 2030 and 2040, the future roadway networks for horizon years 2030 and 2040, as well as future recommended roadway improvement projects and facility types for years 2030 and 2040.

The roadway network outlined in the Street Plan is essential in determining current and future accessibility within the City as well as identifying areas significant to regional connectivity. The development of this Street Plan encompasses major improvements identified in the MAG RTP including an interchange at I-10 and Fairway Drive; both the interim (2030) and ultimate (2040) SR-30 freeway – north of the Southern Avenue alignment; and planned interchanges with the ultimate SR-30 freeway at Dysart Road, Avondale Boulevard, and 107th Avenue.

existing roadway network

To evaluate the current state of the City's roadway network, existing roadway characteristics were collected including facility type, travel speed limits, number of travel lanes, and the presence of bike lanes established on study area roadways. Traffic volume data was obtained via average daily traffic (ADT) counts collected during the first quarter of 2017.

existing functional classification/facility Type

As determined by the previous transportation plan, the existing roadway functional classification is illustrated along with other existing network features in Figure 4-1. In accordance with the City's General Engineering Requirements Manual, there are four roadway classifications that City-controlled facilities could fall into:

- Arterial Street (6-lane cross-section)
- Phased Arterial Street (4- or 5-lane cross-section)
- Collector Street
- Local Street.

Also, roadways significant to regional connectivity that are classified as Freeway or Roads of Regional Significance (RRS) have been considered in the Street Plan. Existing and planned freeway facilities by horizon years 2030 and 2040 addressed in the Street Plan include: I-10, Loop 101, and both the Interim SR-30 and Ultimate SR-30. Current RRS identified in the Street Plan include Indian School Road, MC-85 (Main Street/Buckeye Road), the segment of Dysart Road north of MC-85, and the segment of 99th Avenue south of I-10.



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In an effort to accurately determine the current and future state of the transportation network, a re-evaluation of future roadway facility types within the City is incorporated in the Street Plan. For instance, while the previous transportation plan identified El Mirage Road (south of Broadway Road) as a future 6-lane arterial, there is no anticipated interchange with the planned SR-30 freeway or projected travel demand to require that segment of El Mirage Road to be designated as a 6-lane Arterial.

existing traffic data

As part of the City's annual traffic count collection, 2017 ADT data along major corridors was used in this transportation update. Traffic count volumes were used to validate the modeled volumes presented in Figure 4-1 as bi-directional ADT. The timing of the traffic count collection in the beginning of the year reflects comparably with peak season travel volumes, in effect no adjustment was necessary for determining annual ADT.

existing truck routes

Figure 4-1 also illustrates the City's truck routes, truck routes in close proximity designated by the City of Goodyear, and truck routes on shared regional facilities (i.e. I-10 and MC-85). Existing truck routes are designated by City Ordinance 23-14:

- 1) Litchfield Road from MC-85/Buckeye Road to Broadway Road
- 2) 107th Avenue from the south end to McDowell Road.

Historical truck data indicate the percentage of heavy vehicle traffic (trucks with greater than two axles in addition to buses) on designated truck routes varies from 5% to 8%. These rates are higher than those recorded on adjacent roadways – signifying the impact that designating truck routes has on the roadway network. Truck rates on Lower Buckeye Road were comparable to designated truck routes – indicating a potential need for future designation of this roadway as a truck route. However, adjacent parallel arterial to Lower Buckeye Road – MC-85 – already is a designated truck route, given its RRS status. Dysart Road also should be considered for designation as a truck route between Southern Avenue and Broadway Road – given the active mining sites that will remain operational in the area through the year 2030. To the west of the Agua Fria River, current truck route designations in both Avondale and Goodyear remain adequate to accommodate truck traffic to/from I-10. Furthermore, Maricopa County conducted a truck routing study that ascertained trucking from the east side of the Agua Fria River should be directed through existing truck routes on Litchfield Road via Lower Buckeye Road and Dysart Road/Vermeersch Road.

existing bike facilities

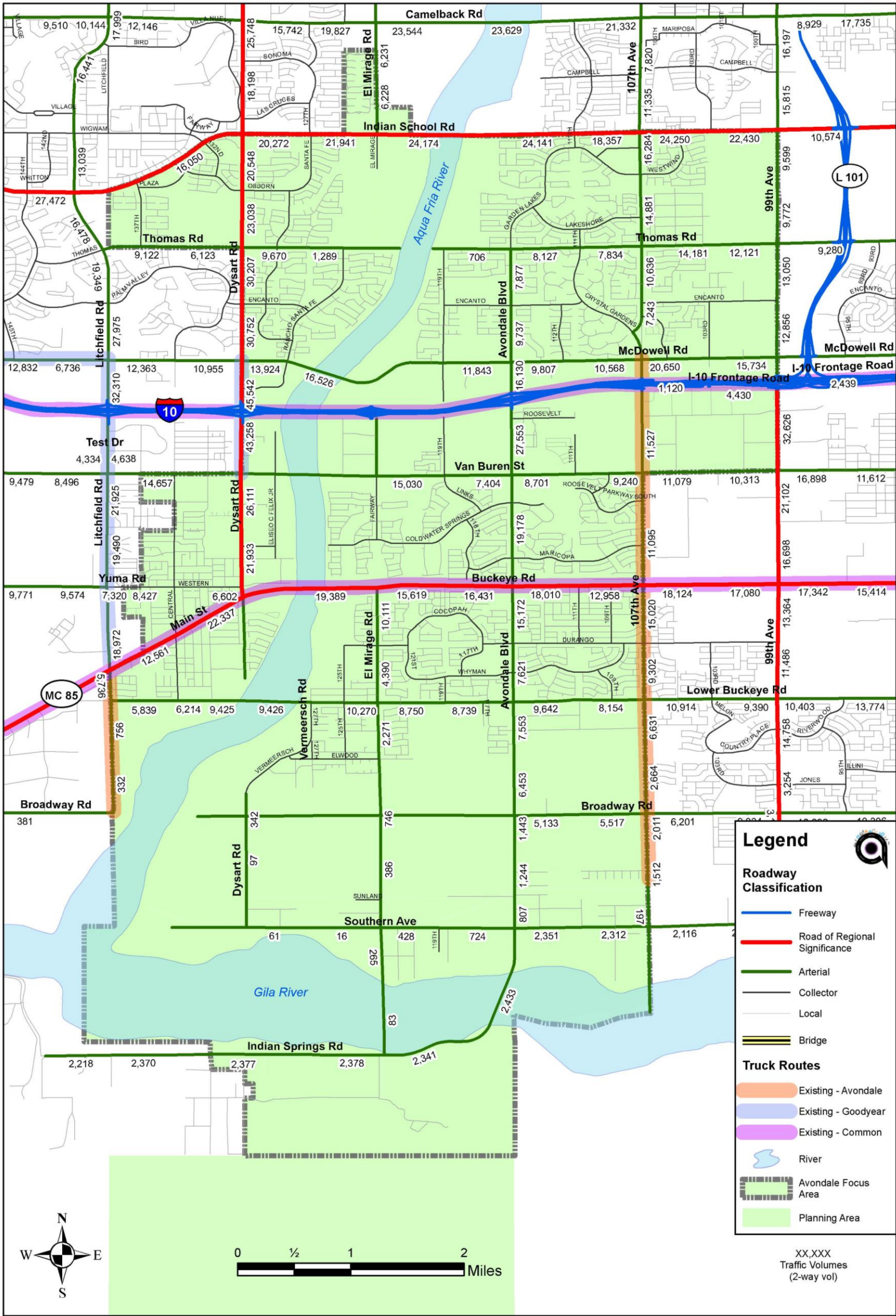
In addition to roadways dedicated to automobiles, existing bike lanes and bike paths were also recorded and assessed in the Transportation Plan. Existing bicycle facilities within the City and surrounding areas are presented in Figure 4-2. Multimodal travel and connectivity is key to sustaining a growing city and fostering a greater urban environment. Transportation for all modes of travel should



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Figure 4.1 Existing Roadway Characteristics

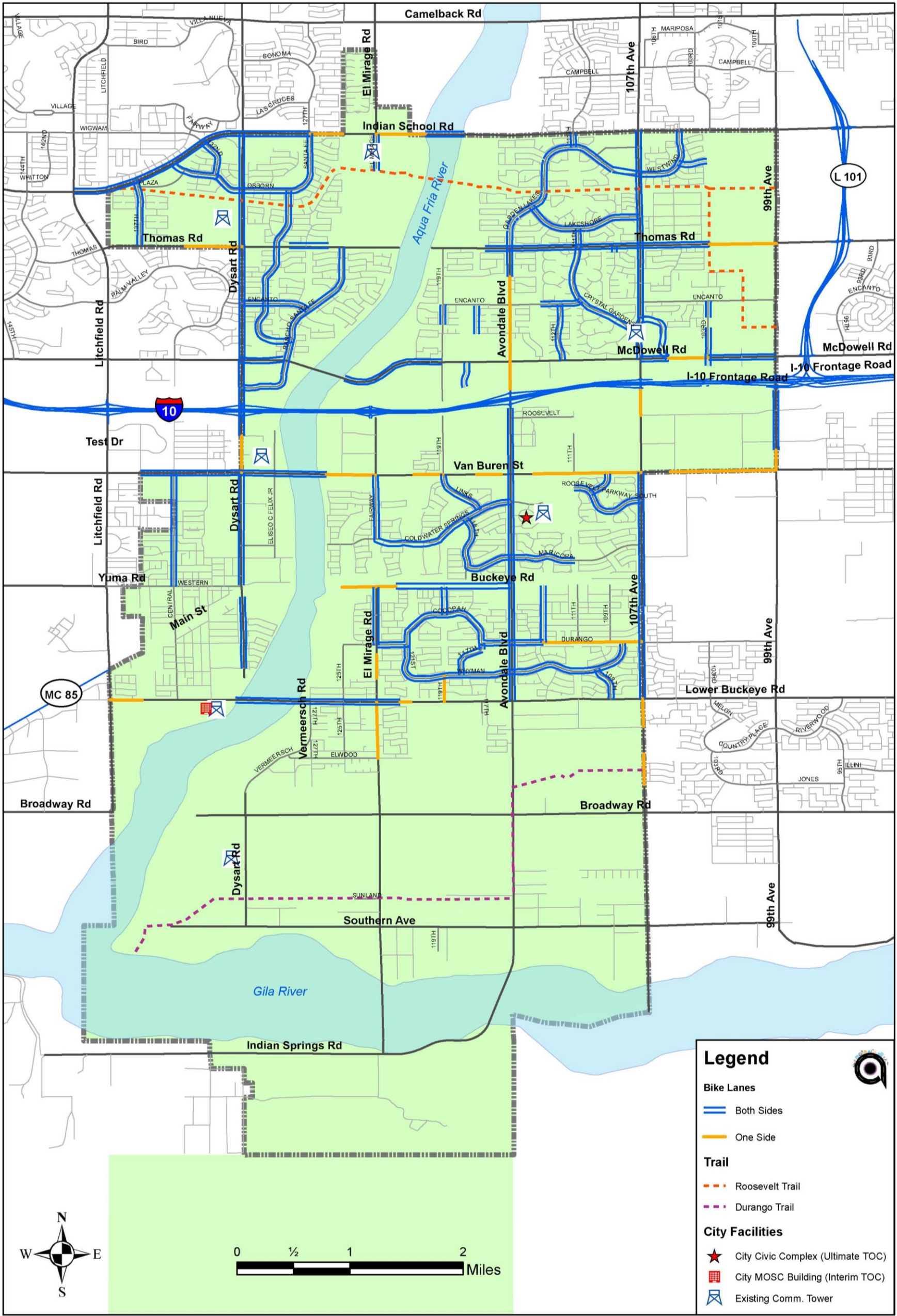




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Figure 4.2 Existing Bicycle Network





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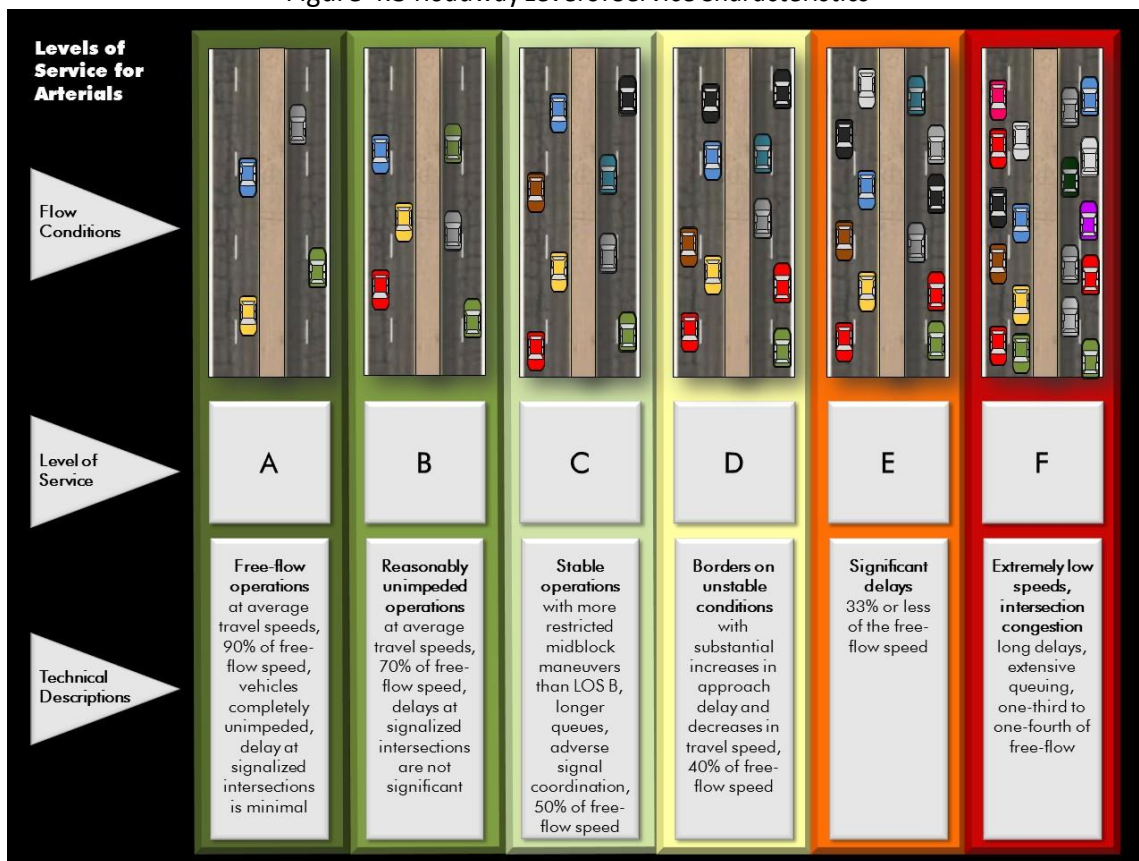
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be safe and provide access/connectivity to residential, commercial, employment, and recreational areas. Bicycle facilities promote healthier lifestyles for residents, visitors, and the workforce. Provided with satisfactory facilities, bike lanes can serve both commuting and typical trip purposes in addition to recreational use. The implementation of bike lanes is particularly effective when integrated along public transportation routes – as it increases the potential for multimodal travel. There are a myriad of benefits to incorporating bicycle facilities into the Street Plan including increasing transportation access, providing incentive for personal exercise, travel cost savings, and reducing emissions from automobile usage.

roadway analysis methodology

Consistent with both the previous transportation plan as well as industry standards, operational level of service (LOS) for roadway segments is determined by the combination of physical roadway characteristics and ADT volumes. Figure 4.3 represents the performance of arterial roadways considered to operate at LOS A down to LOS F.

Figure 4.3 Roadway Level of Service Characteristics





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Contributing roadway characteristics in determining LOS include physical features such as number of lanes, traffic flow, and signal spacing. Using these characteristics, roadway capacities are estimated which are used as a basis to determine volume thresholds for each LOS. Table 4.1 below depicts the service volumes thresholds depicted in the Maricopa Association of Government's regional model for number of through lanes on a facility in urban areas. While roadway LOS provides a quantified performance measure, LOS is intended to be used as a guide in qualitative planning of roadway segment operation and network performance. Moreover, a roadway facility should also incorporate the ability of an arterial intersection to process the peak hour volume associated with the daily traffic demand into its functional capacity. In effect, the thresholds identified in Table 4-1 represent guiding values not standards.

Table 4.1 Roadway Level of Service Thresholds

Roadway Class/Type	Total Number Through Lanes	Daily Volume Limit Yielding Shown Level of Service		
		A - C	D	E
Arterial	2	16,800	19,600	23,300
	4	35,400	41,300	49,200
	6	53,100	62,000	73,800
Collector	2	10,900	12,700	15,100
	4	22,100	25,800	30,700
Local	2	2,000	2,600	2,700

Source: Maricopa Association of Governments Regional Transportation Model (2017)

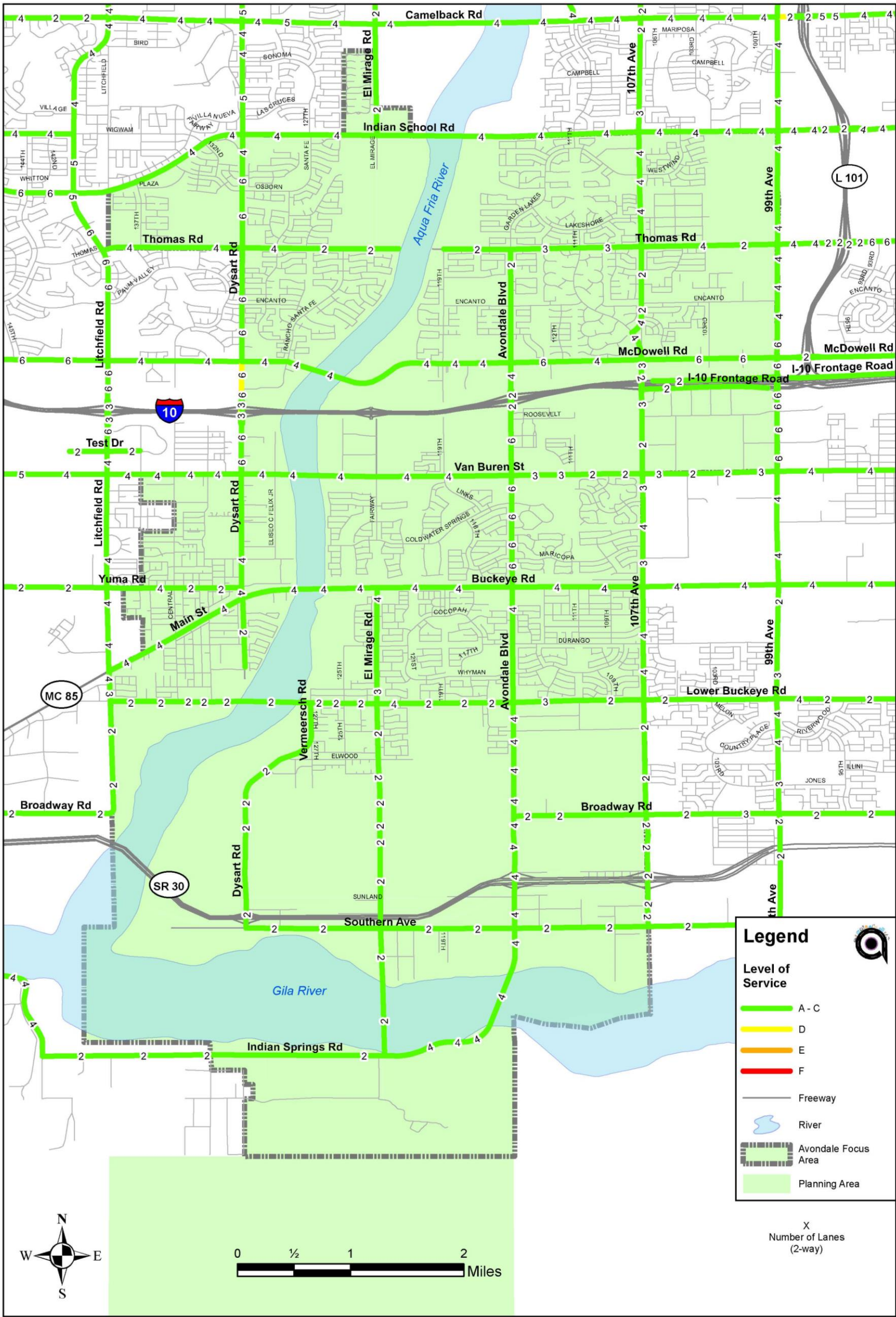
The LOS/volume thresholds take into account that roadways designated as arterials usually encompass a median two-way-left-turn lane. This center turn lane effectively increases the capacity of the roadway, regardless that the additional lane does not operate as a through lane. Figure 4-4 presents the current LOS for major roadways in the City's roadway network.



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Figure 4.4 Existing Roadway Level of Service





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safety analysis

The City of Avondale published for the first time a Strategic Transportation Safety Plan (STSP) in 2016 in efforts to achieve the National Safety Performance Goal, “To achieve significant reduction in traffic fatalities and serious injuries on all public roads.” The STSP was developed as a data driven and performance based assessment that would serve as the foundation for establishing a local transportation safety vision. Consistent with the Federal Highway Administration’s planning process, the plan also incorporates the four “E’s” of safety: Engineering, Education, Enforcement, and Emergency Medical Services (EMS). Furthermore, the City’s plan was coordinated with both Arizona’s Strategic Highway Safety Plan (SHSP) and MAG’s STSP to provide implementation recommendation that addresses transportation safety at the local level. The STSP presented an evaluation of the City’s network. Based on severity levels and frequency of crashes, it identified priority intersections, roadway segments, summarized the total crashes by category, and provided implementation guidance to address identified action areas.

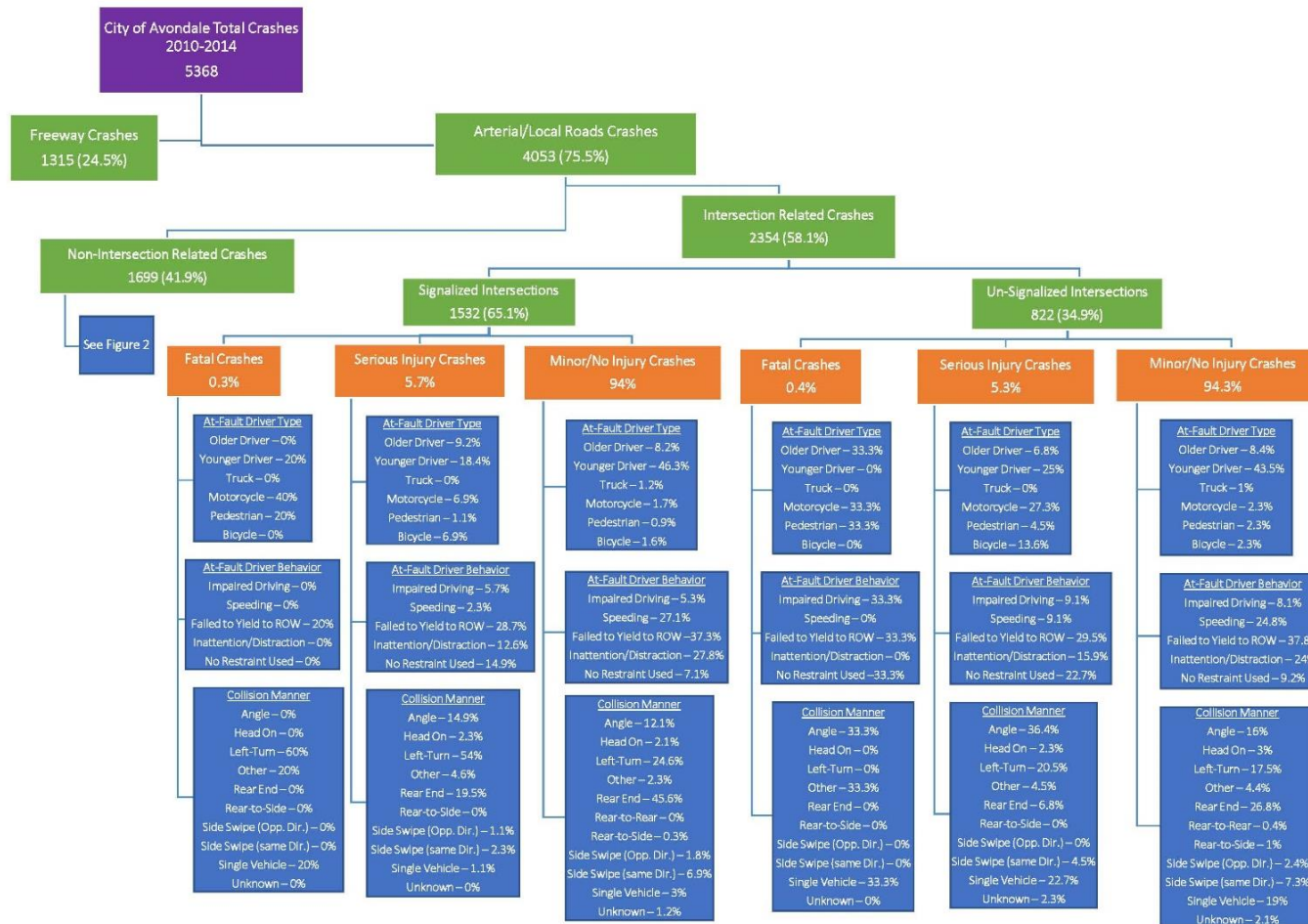
According to the STSP, the City of Avondale experienced 5,368 total crashes from 2010-2014. Of the total crashes, 1,315 (or 24.5%) were freeway crashes and the remaining 4,053 (or 75.5%) were arterial/local roads crashes. While freeway crashes were not broken down into detail, the arterial/local crashes were further categorized by intersection and non-intersection related crashes. Crash type characteristics within these two categories are summarized for crashes involving fatalities and/or serious injuries only in Figure 4.5 and Figure 4.6, respectively. The level of detail for these serious and fatal crashes is summarized in the graphic below, depicting: at-fault driver type, at-fault driver behavior, and collision manner.



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Figure 4.5 Crash Type Characteristics for Intersection-Related Crashes on Arterial and Local Roadways



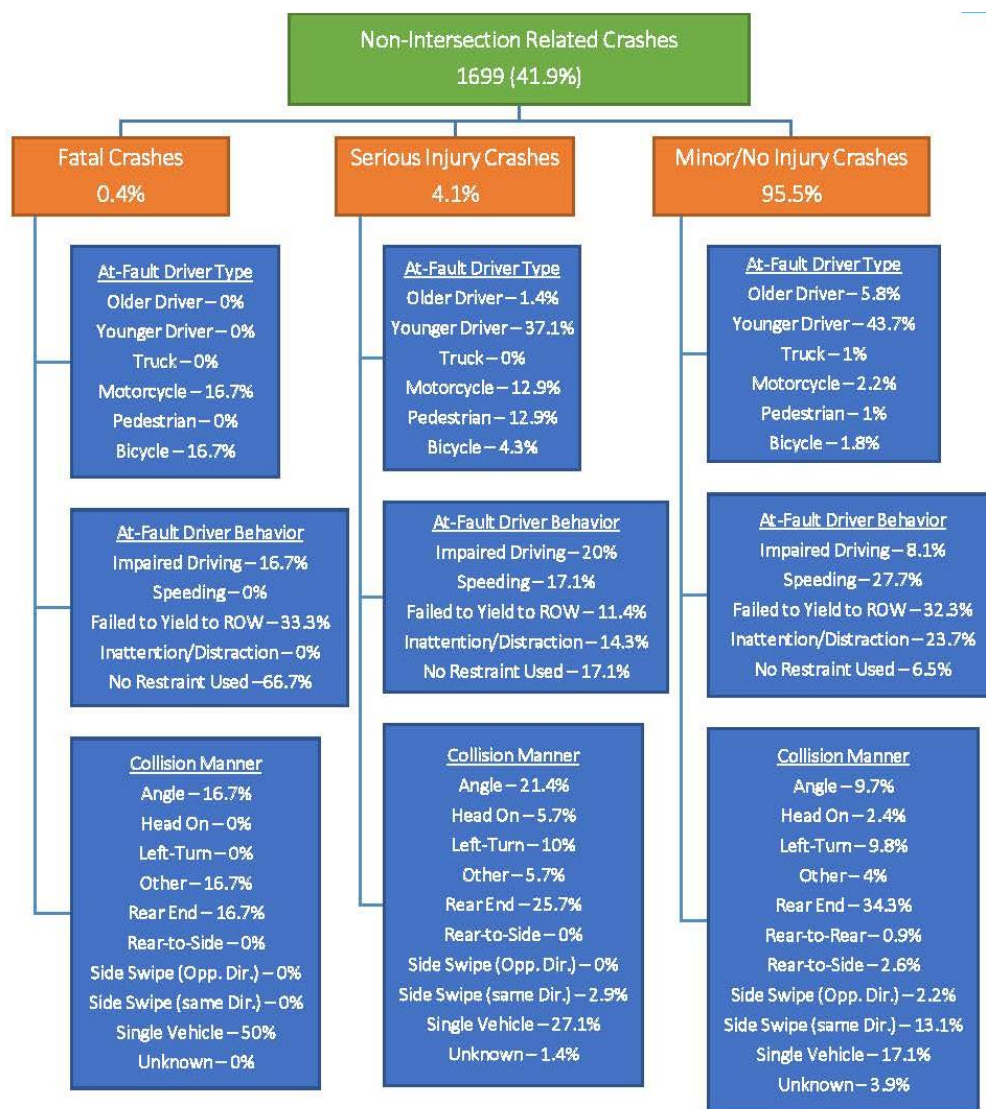
Source: City of Avondale Strategic Transportation Safety Plan, 2016



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Figure 4.6 Crash Type Characteristics for Non-Intersection-Related Crashes on Arterial and Local Roadways



Source: City of Avondale Strategic Transportation Safety Plan, 2016

high-crash intersection locations

Referencing the STSP *Technical Memorandum #5*, intersection-based crashes were categorized by roadway functional classification type and ranked by average crash severity. Crash severity scores were assessed for the top three intersections ranked in each category and summarized in Table 4-2.



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Table 4.2 High-Crash Intersections

Category	Intersection	Average Crash Frequency	Crash Severity Score
Within Half-Mile of Interchange	Dysart Rd/McDowell Rd	29.4	3.05
	Dysart Rd/Van Buren St	26.2	1.93
	107th Ave/McDowell Rd	21.0	2.16
Arterial/Arterial	Dysart Rd/Main St	11.4	1.50
	Avondale Blvd/Van Buren St	9.6	1.03
	107th Ave/Thomas Rd	9.4	0.83
Arterial/Collector	McDowell Rd/Rancho Santa Fe	18.0	1.21
	Dysart Rd/Osborn Rd	6.8	1.05
	McDowell Rd/103rd Ave	5.2	1.07
Arterial/Local	McDowell Rd/101st Ave	5.4	0.36
	4th St/Main St	2.8	0.85
	Dysart Rd/Riley Dr	2.4	0.57
Collector/Collector	Central Ave/Western Ave	1.8	1.00
	111th Ave/Garden Lakes Pkwy	1.2	0.50
	Santa Fe Trail/Osborn Rd	0.6	0.30
Collector/Local	Central Ave/Loma Linda Blvd	0.8	0.40
	Central Ave/La Canada Blvd	0.8	0.50
	Central Ave/Madden Dr	0.8	0.60
Local/Local	4th St/Harrison Dr	1.2	0.20
	105th Ave/Pierce St	0.8	0.20
	5th St/Madden Dr	0.6	0.20

Source: Avondale Strategic Transportation Safety Plan (STSP), *Technical Memorandum #5*, 2016.

high-crash roadway segments

Identified in Technical Memorandum #5, Dysart and McDowell Road are top priority travel corridors and were analyzed by crash frequency. The summary of crash rates along these two corridors is presented in Table 4.3.



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Table 4.3 High-Crash Roadway Corridors

Corridor	Segment	Crash Rate	Roadway Classification
Dysart Road	Indian School Rd to Thomas Rd	1.11	Arterial
	Thomas Rd to McDowell Rd	1.05	Arterial
	McDowell Rd to Van Buren St	5.18	Within 1/2 mi of Interchange
	Van Buren St to Western Ave	4.90	Arterial
	Western Ave to Whyman Ave	3.89	Arterial
McDowell Road	Dysart Rd to Friendship Park	4.61	Arterial
	Friendship Park to Avondale Blvd	0.97	Arterial
	Avondale Blvd to 107th Ave	1.71	Arterial
	107th Ave to 101st Ave	1.14	Arterial
	101st Ave to 99th Ave	1.95	Within 1/2 mi of Interchange

Source: Avondale Strategic Transportation Safety Plan (STSP), *Technical Memorandum #5*, 2016.

safety implementation plan

Coordinating with the respective safety plans of other agencies (i.e., Arizona SHSP and MAG STSP), an Implementation Plan Matrix (Table 4.4) was prepared to identify appropriate strategies for addressing issues associated with intersections and roadway segments identified in Tables 4.2 and 4.3.

future travel demand

For accuracy and overall consistency with other transportation agencies in the Maricopa County, travel demand modeling efforts were managed by MAG using the organization's regional Travel Demand Model (TDM), which encompasses all of Maricopa County and portions of Pinal County. Understanding the City's goals to maintain its future growth was key to customizing the MAG Regional TDM and ensuring it represented the City's vision for horizon years 2030 and 2040. The focus area of Avondale, spanning approximately 51 square miles, was divided into 36 Traffic Analysis Zones (TAZs), which allowed for a more detailed assessment of the transportation needs in specific areas of the City. Figure 4-7 illustrates the City's TAZ structure.

travel demand modeling

Travel demand modeling requires several inputs, including socioeconomic conditions (discussed in Chapter 3) disaggregated by TAZ, roadway network characteristics (such as lanes, speeds, and geometry), trip information (i.e., origin-destination pairing), and external trip inputs associated with origins and destinations outside the City. Basic outputs of the regional TDM runs included forecasted total volumes on each roadway segment for weekday traffic as well as volumes for each peak period in the day. Though model forecasted volumes were calibrated by MAG for each horizon year (2030 and



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Table 4.4 Safety Implementation Plan

Action Area	EE Addressed	Strategies		Potential Funding Source	Documented Effectiveness*	Lead Department/Division	Cost (1000's)	Unit	Time Frame	Annualized Implementation Costs (1000's)
1.0 Reduce death and serious injuries from Speeding	Enforcement	1.1	Conduct enforcement in work and 15 mph school zones.	GOHS	HIGH	Avondale Police Department	\$ 180	Per year	Short	\$ 180
		1.2	Use targeted conventional speed enforcement.	GOHS	HIGH		\$ 18	Per location	Short	\$ 72
	Education	1.3	Utilize a multimedia approach to educate drivers.	Operating Budget	MED	Community Relations & Public Affairs	\$ 5	Ea	Short	\$ 5
		1.4	Conduct Public information campaign to support enforcement programs.	Operating Budget	MED		\$ 3	Ea	Short	\$ 3
	Engineering	1.5	Implement appropriate ITS technology for road safety.	CIP-New	MED	Development & Engineering Services	\$ 50	Per year	Medium	\$ 50
		1.6	Reinstate neighborhood traffic calming program to reduce speeds.	CIP-NTMP	HIGH		\$ 40	Per year	Medium	\$ 40
	Operating Budget			\$ 22.5		Per year	Medium	\$ 22.5		
2.0 Reduce death and serious injuries from Distracted Driving	Enforcement	2.1	Improve data collection and reporting for distracted driving crashes.	-	-	Avondale Police Department	\$ 0	Semi-annually	Medium	\$ 0
	Education	2.2	Conduct aggressive public information campaigns to discourage all forms of distracted driving.	Operating Budget	MED	Community Relations & Public Affairs	\$ 2.5	Ea	Medium	\$ 2.5
		2.3	Incorporate information on distracted driving into education programs and materials for young drivers.	-	MED	Development & Engineering Services	\$ 0	Per year	Short	\$ 0
3.0 Reduce death and serious injuries related to Intersection Safety	Engineering	3.1	Optimize clearance intervals.	MAG TSOP Program	HIGH	Development & Engineering Services	\$ 2	Ea intersection	Short	\$ 10
		3.2	Provide/improve visibility for left-turning vehicles at intersections.	CIP-New	HIGH		\$ 10	Ea intersection	Medium	\$ 10
		3.3	Implement systemic improvements based on identifying characteristics of high risk locations.	HSIP	-		\$ 250	Ea intersection	Medium	\$ 50
	EMS	3.4	Implement emergency vehicle preemption.	CIP-Programmed	HIGH	Development & Engineering Services	\$ 20	Ea intersection	Medium	\$ 6
		3.5	Assess proper working condition of existing emergency vehicle preemption.	-	-		\$ 0	Ea intersection	Short	\$ 0
		3.6	Implement best practices for emergency vehicle preemption.	-	-		\$ 0	Per year	Medium	\$ 0
4.0 Reduce death and serious injuries for Young Drivers	Education	4.1	Explore methods of promoting or implementing Safe Driving pledge campaigns.	-	-	Development & Engineering Services/ Community Relations & Public Affairs/ High Schools/ Community Colleges	\$ 0	Ea	Short	\$ 0
		4.2	Distribute information for driver education programs.	Operating Budget	LOW	Community Relations & Public Affairs and DDEd/Avondale School Districts	\$ 2.5	Ea	Long	\$ 2.5
		4.3	Promote stronger parental/guardian education and engagement in the licensure process for young drivers.	Operating Budget	LOW		\$ 1	Ea	Long	\$ 1
		4.4	Implement safe driving campaigns to target young drivers.	Operating Budget	HIGH	Community Relations & Public Affairs	\$ 2.5	Ea	Medium	\$ 2.5
5.0 Reduce death and serious injuries for Vulnerable Road Users - School Zone Users	Enforcement	5.1	Increase enforcement of existing laws designed to promote pedestrian safety.	GOHS	MED	Avondale Police Department	\$ 50	Per year	Short	\$ 50
	Education	5.2	Initiate the City's Safe Routes to School Program.	CIP-Local Match	MED	Development & Engineering Services	\$ 1.14	Per school	Medium	\$ 4.56
	Engineering	5.3	Optimize signal operation during school hours.	MAG TSOP Program	MED	Development & Engineering Services	\$ 2	ea.	Medium	\$ 3

* Effectiveness of the strategies is based on the "Countermeasures That Work" NHTSA report and the NCHRP 500 Series reports where this information was available.

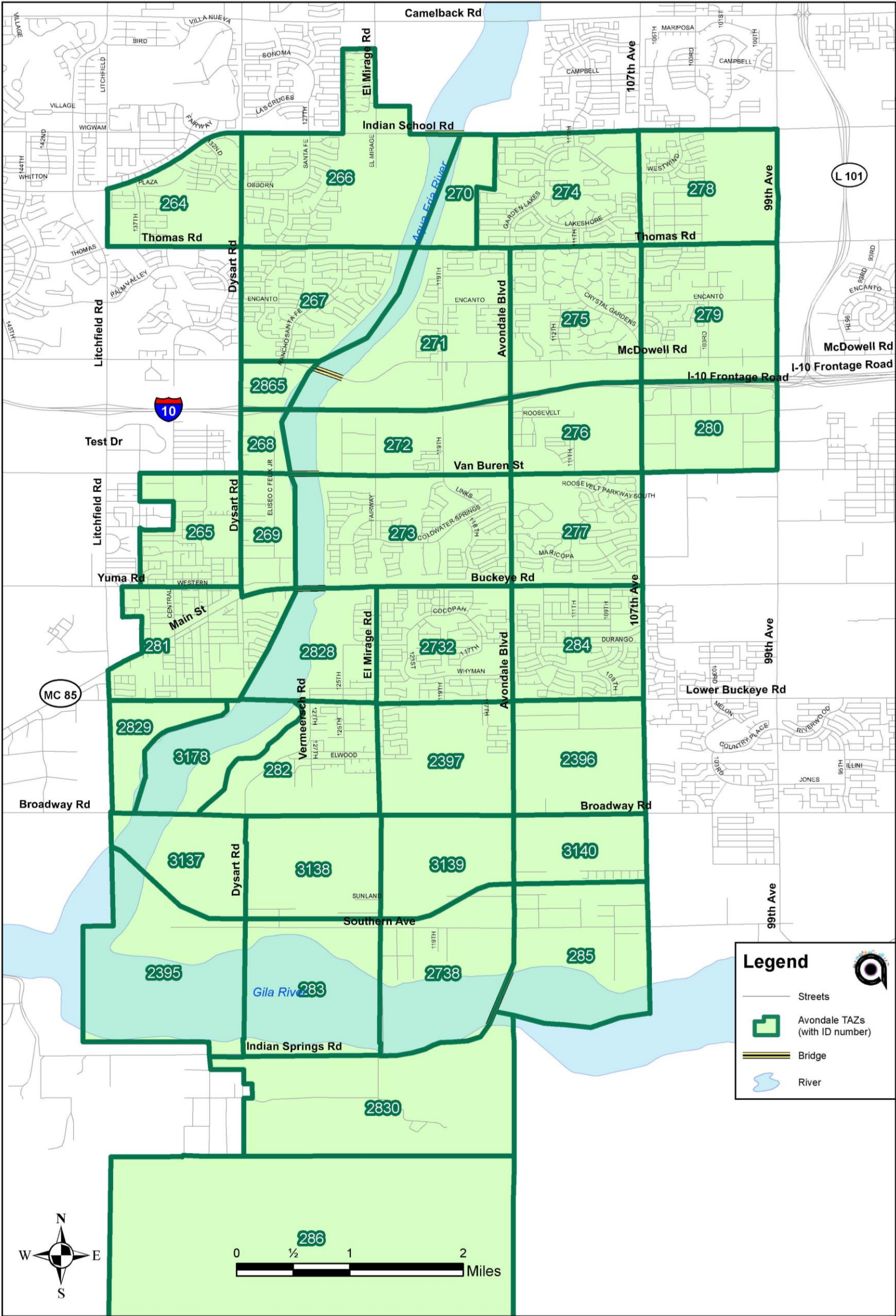
* Effectiveness of the strategies is based on the "Countermeasures That Work" NHTSA report and the NCHRP 500 Series reports where this information was available.



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Figure 4.7 Transportation Analysis Zones





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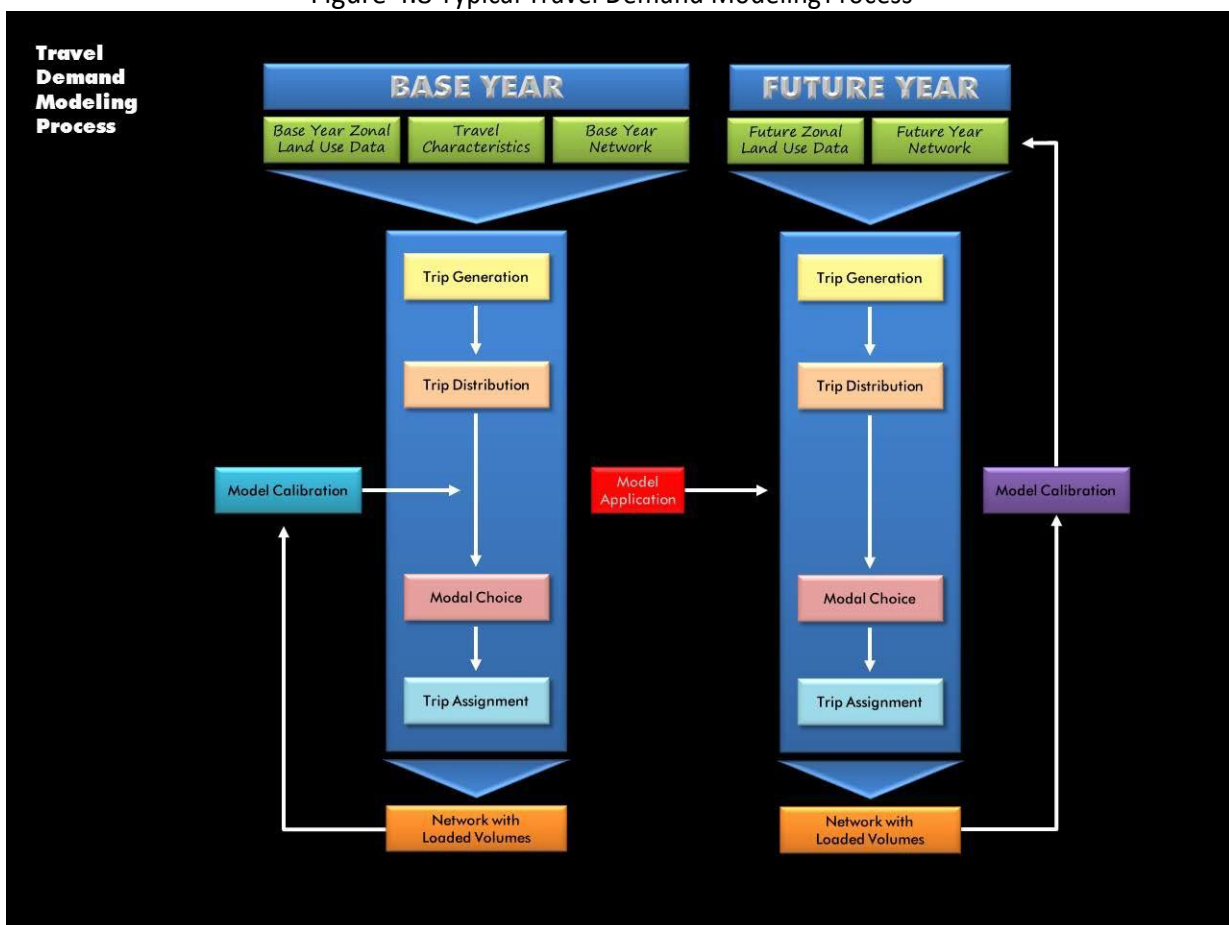
2040 conditions with respect to regional connectivity), model volumes also were further adjusted to account for more detailed travel patterns as indicated by the City's annual traffic count data.

travel demand modeling and forecasting methods

The MAG Regional TDM implemented for the City's purposes was the commonly-practiced, four-step process. The four-step process includes trip generation, trip distribution, modal split, and trip assignment, all of which are outlined in Figure 4.8 and detailed below.

- 1) **Trip Generation:** Step One essentially consists of gathering all the information ascertained about the City, as presented in Chapter 3, to predict how trips will be generated, produced, or attracted to each TAZ, based on land use and socioeconomic parameters.
- 2) **Trip Distribution:** Step Two assesses the correlation between trip generators and attractors between various TAZs and estimates an origin and destination (O-D) pair for each type of trip occurring within the TAZ structure.

Figure 4.8 Typical Travel Demand Modeling Process





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- 3) **Modal Split:** Step Three apportions trips according to each available mode of travel (i.e., mode choice) between TAZ pairs as well as TAZ's in close proximity to transit routes or TAZs with dedicated transit-oriented development (TOD).
- 4) **Trip Assignment:** Step Four is focused on ascertaining the routes that trips will take to reduce travel time cost. This step in the model includes multiple iterations, as the model attempts to converge towards a minimized travel time cost for the entire network such that travel times for all trips are optimized and network equilibrium is reached.

future roadway network analysis

The 2030 and 2040 horizon networks with the aforementioned land use and socioeconomic projections, respectively, were analyzed with various regional assumptions and coordinated with the City's identified future improvement projects.

2030 Horizon

The 2030 horizon roadway network was analyzed with the following regional and local assumptions:

Regional improvements –

- Interim SR-30, utilizing the Southern Avenue alignment, would be in place with interim at-grade intersections at Dysart Road, El Mirage Road, Avondale Boulevard, and 107th Avenue;
- Development of a new interchange I-10/Fairway Drive (El Mirage alignment); and
- Widening of the I-10 and Loop 101 freeways would be accomplished.

Local Improvements –

- Established arterial network of at least 4-lanes on all major roads (with few exceptions where road diets currently are in place or right-of-way is constrained);
- 6-lane widening projects on major East-West travel corridors, including McDowell Road and Van Buren Street;
- Construction of a 4-lane bridge across Agua Fria River along the Lower Buckeye alignment (currently a low water crossing).

In addition to these key assumptions, additional network connectivity scenarios were tested for the 2030 horizon year. These included new crossings of the Agua Fria River at Thomas Road and Dysart Road as well as modifications to the network connectivity of El Mirage Road between Broadway Road and the future SR-30 freeway and Broadway Road between Dysart Road and Avondale Boulevard.



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2040 Horizon

The 2040 horizon roadway network was analyzed with all of the 2030 assumptions and the following regional and local assumptions:

Regional improvements –

- SR-30 freeway would be in place with three interchanges at Dysart Road, Avondale Boulevard, and 107th Avenue, a grade separation at El Mirage Road, and Southern Avenue would be designated as a Frontage Road.

Local Improvements –

- Construction of two 4-lane bridges across the Agua Fria and Gila rivers providing continuous roadway connectivity to the Dysart Road alignment.
- Construction of a 4-lane bridge across the Agua Fria River and constructing continuous roadway lane facilities along the Thomas Road alignment.¹

The 2040 analysis included the same network scenario testing as described previously for 2030, as well as additional scenarios that examined the impacts of widening the existing Agua Fria River crossings at Indian School Road and McDowell Road in lieu of the new crossing on Thomas Road.

The resulting TDM volume outputs were contrasted against capacities of the future roadway network to identify recommended network improvements for Years 2030 and 2040. The MAG Regional TDM output volumes were calibrated for the LOS analyses to adjust for discrepancies between predicted existing roadway network volumes and actual traffic counts collected by the City. Figure 4-9 and Figure 4-10 depict the LOS and forecast volumes for horizon years 2030 and 2040, respectively, under the aforementioned assumptions for the roadway network.

The LOS analyses results depicted in Figures 4-9 and 4-10 indicate future roadway networks assumed for both horizon years will accommodate forecasted traffic volumes with ease. Because both roadway networks are anticipated to operate at an acceptable LOS under assumed conditions, no further network alternatives were necessary to pursue alleviation of adverse traffic conditions. Also, given that all roads operate at an acceptable LOS, the networks then were analyzed to identify which assumptions represent projects that were necessary and could be prioritized. To determine which roadway projects were necessary, the forecast model volumes for each horizon year were applied to the existing roadway network to obtain LOS analyses in the event the roadway expansion improvements/assumptions were not performed. Using this approach, several roadway segments were identified that require improvements in order to accommodate the future travel demand, these roadway segments represent the improvement projects recommended in this transportation plan.

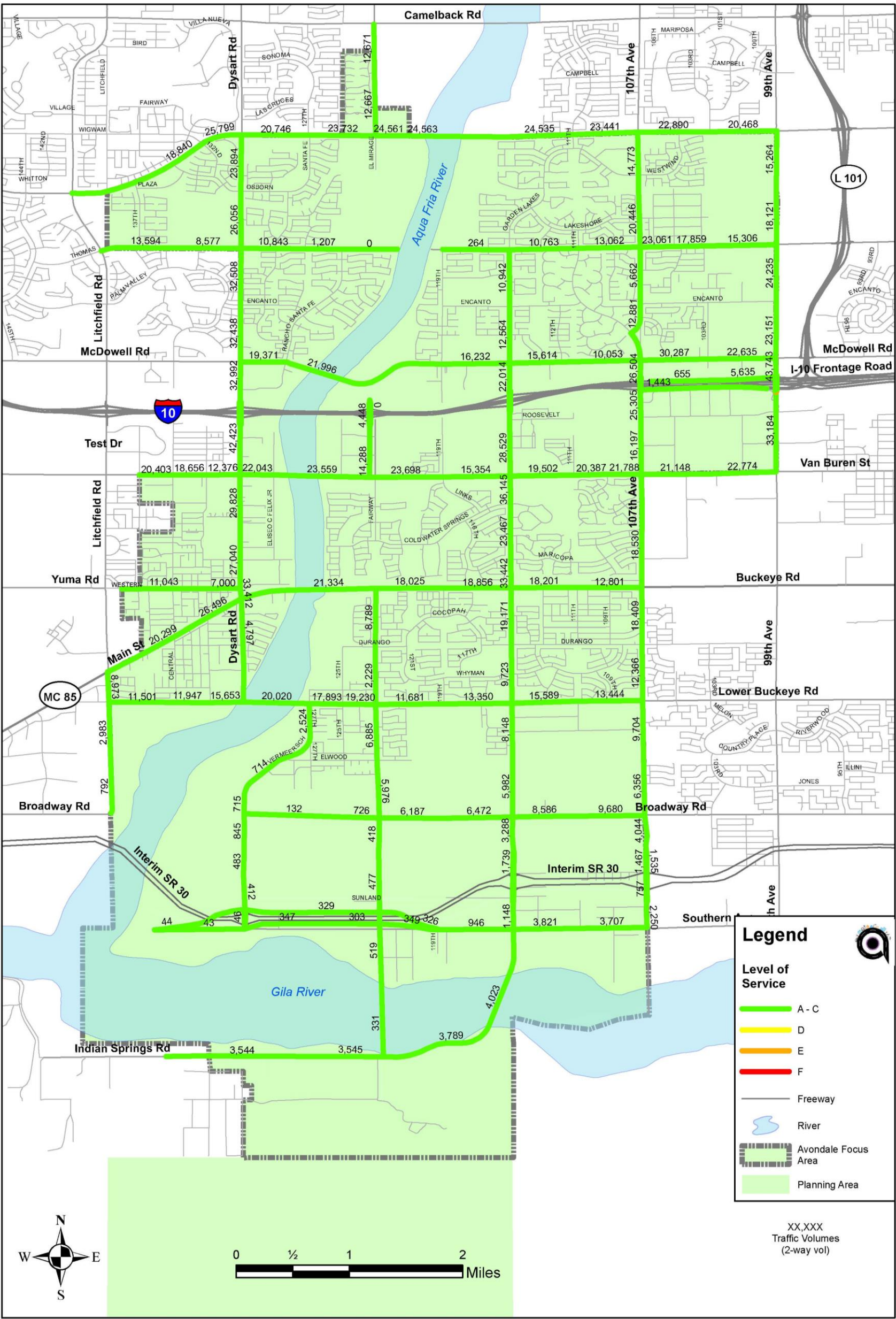
¹ The improvements to Thomas Road including the bridge construction and roadway expansion were analyzed as a network alternative scenario.



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Figure 4.9 Year 2030 Roadway Level of Service

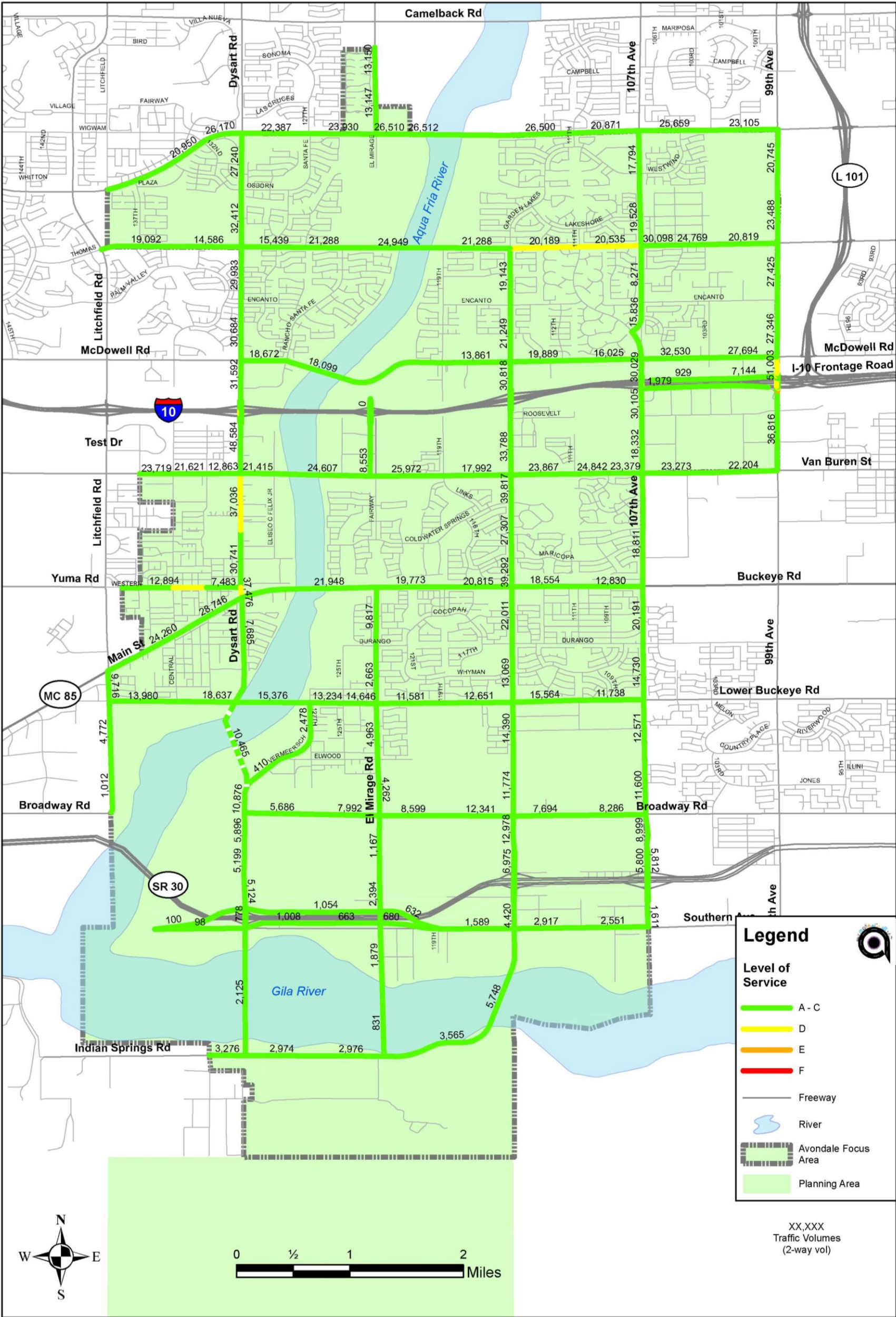




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Figure 4.10 Year 2040 Roadway Level of Service



Note: Green Dashed Lines indicate alternative roadway alignments subject to future studies.





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recommended roadway improvement projects

The following two sections identify the specific roadway system improvement projects that need to be accomplished in the future to assure the City a roadway network that provides an acceptable LOS.

roadway improvement projects for 2030

From the analyses conducted for the 2030 horizon year, improvements outlined in this section represent recommended projects that should be prioritized, committed, and implemented by the year 2030 in order to maintain adequate LOS on identified roadway segments. The following recommended projects are organized by location (not order of significance) and are depicted in Figure 4-11.

East – West Corridors

- *Thomas Road – 103rd Avenue to 99th Avenue: roadway expansion to 4-lanes²*
- *Thomas Road – 127th Avenue to Agua Fria disconnect (future bridge): roadway expansion to 4-lanes*
- *Thomas Road – 122nd Avenue to 119th Avenue: new 4-lane bridge³*
- *Thomas Road – Agua Fria disconnect (future bridge) to 400' east of 116th Avenue: roadway expansion to 4-lanes*
- *McDowell Road – 117th Avenue to Avondale Boulevard: roadway expansion to 6-lanes*
- *McDowell Road – 112th Avenue to Harbor Shore Boulevard: roadway expansion to 6-lanes*
- *Van Buren Street – Agua Fria Bridge to 107th Avenue: roadway expansion to 6-lanes*
- *Van Buren Street – 107th Avenue to 99th Avenue: roadway expansion to 5-lanes*
- *Lower Buckeye Road – Litchfield to the Agua Fria River: roadway expansion to 4-lanes*
- *Lower Buckeye Road – Agua Fria River to El Mirage: roadway expansion to 4-lanes*
- *Lower Buckeye Road – 121st Avenue to 107th Avenue: roadway expansion to 4-lanes*
- *Broadway Road – Dysart Road to Avondale Boulevard: new construction of 4-lanes*
- *Broadway Road – Avondale Boulevard to 107th Avenue: roadway expansion to 4-lanes*
- *Southern Avenue – 119th Avenue to 107th Avenue: roadway expansion to 4-lanes*
- *Indian Springs Road – City Limits to El Mirage Road: roadway expansion to 4-lanes*

North – South Corridors

- *Litchfield Road – Lower Buckeye Road to Broadway Road: roadway expansion to 4-lanes*
- *Dysart Road – MC-85 to Lower Buckeye Road: roadway expansion to 4-lanes*
- *Dysart/Vermeersch Road – Lower Buckeye Road to Interim SR-30: roadway expansion to 4-lanes*
- *Fairway Drive – Van Buren Street to Garfield Street: roadway expansion to 4-lanes*
- *El Mirage Road – Durango Street to Interim SR-30 to Indian Springs Road: roadway expansion to 4-lanes*
- *Avondale Boulevard – Thomas Road to McDowell Road: roadway expansion to 4-lanes*
- *Avondale Boulevard – Lower Buckeye Road to SR-30: roadway expansion to meet City standards*

² Thomas Road expansion from 103rd Avenue to 99th Avenue was completed during the plan phase in 2017 and therefore not included in subsequent cost estimate summaries.

³ While the Agua Fria crossing was analyzed in the year 2040, feedback from stakeholders suggested that the crossing be considered in the earlier 2030 Horizon Year.



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- *Avondale Boulevard –Interim SR-30 to Southern Avenue: roadway expansion to 6-lanes*
- *Avondale Boulevard – Gila River to Southern Ave: roadway expansion to 4-lanes*
- *107th Avenue – McDowell Road to W Roosevelt Street: roadway expansion to 4-lanes*
- *107th Avenue – Van Buren Street to Roosevelt Parkway: roadway expansion to 4-lanes⁴*
- *107th Avenue – Lower Buckeye Road to Southern Avenue: roadway expansion to 4-lanes*
- *99th Avenue – Indian School to Costco: roadway expansion to 6-lanes*

Worth noting is that the network scenario analysis indicated that the current crossings of the Agua Fria River at McDowell Road and Indian School Road are adequate to address travel demand through Year 2030 north of I-10. In addition, a single 4-lane bridge crossing of the Agua Fria River south of I-10 at Buckeye Road is also sufficient. A new river crossing at Dysart Road is not required to accommodate Year 2030 travel demand.

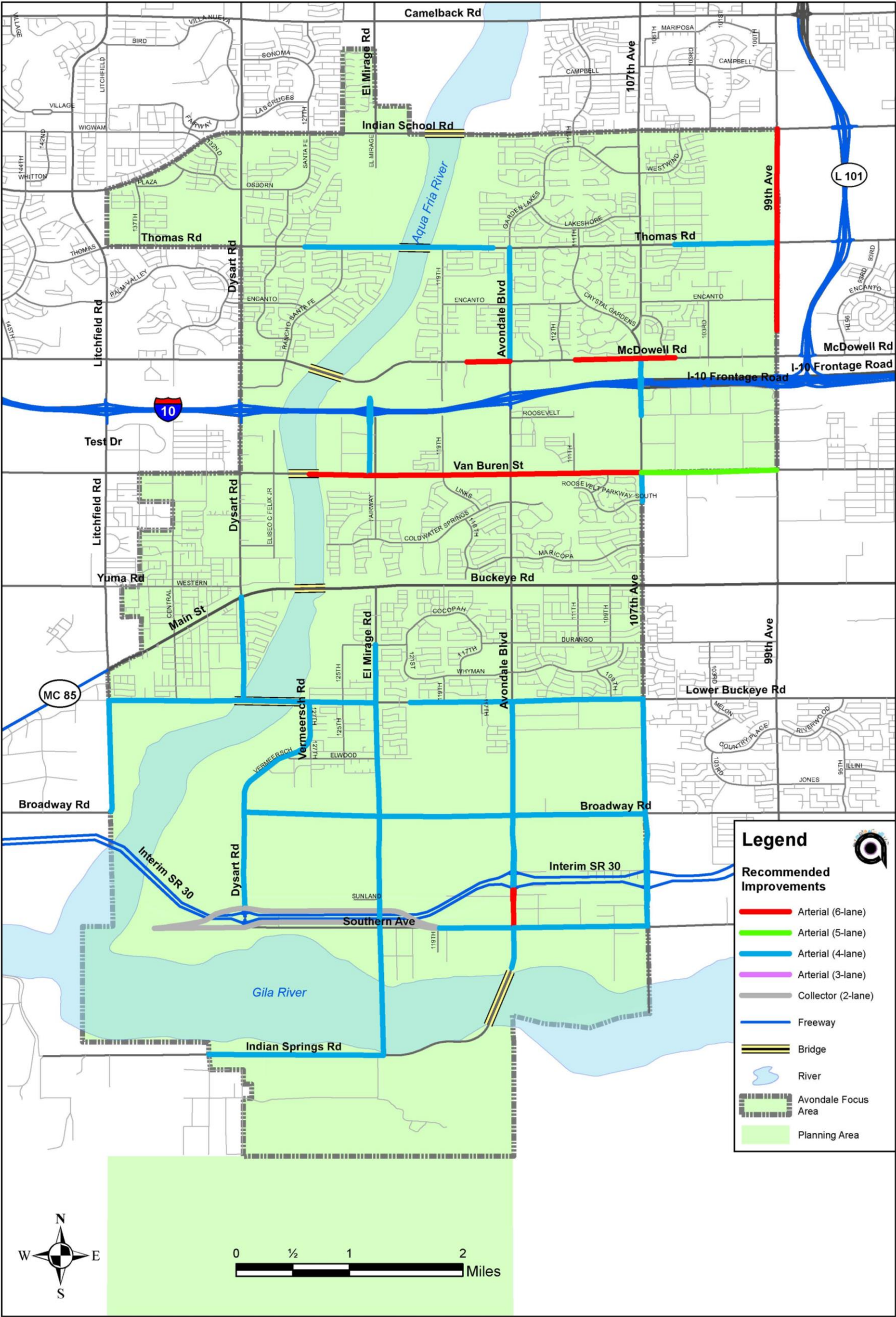
⁴ 107th Avenue expansion from Van Buren Street to Roosevelt Parkway was completed during the plan phase in 2017 and therefore not included in subsequent cost estimate summaries.



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Figure 4.11 Recommended Roadway Improvement Projects through Year 2030





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roadway improvement projects for 2040

From the analyses conducted for the 2040 horizon year, the improvements outlined in this section represent recommended projects that should be prioritized, committed, and implemented by the year 2040 in order to maintain adequate LOS on identified roadway segments. The following recommended projects are organized by location (not order of significance) and are depicted in Figure 4-12.

- *Dysart Road –Lower Buckeye Road to Vermeersch Road: new 4-lane bridge connection (as a potential alternative connection over the Agua Fria River)*
- *Dysart Road –SR-30 to Indian Springs Road: new 4-lane bridge*

Worth noting is the network scenario analysis indicated that the current crossings of the Agua Fria River at McDowell Road and Indian School Road will continue to adequately address travel demand through Year 2040.

recommended street system

Incorporating the recommended improvements identified for the 2030 and 2040 horizon years will produce a street system that is optimized for the areas with the highest projected socioeconomic growth per square mile and still provide adequate access and connectivity to complement the City's future land use objectives. The recommended facility types for the future roadway network provides the framework for the street plan, which should reflect the City's future travel demand, as determined by analyses described in this chapter. Recommended facility type designations for both 2030 and 2040 horizon years are shown in Figure 4-13 and Figure 4-14, respectively. Standard cross-sections for each facility type are in Figure 4-15.

In the less developed portions of the MPA, particularly in the area south of Lower Buckeye Road, the facility type and alignments associated with the recommended network are conceptual and intended to show desired network capacity and circulation to accommodate future growth. As more specificity occurs regarding the proposed developments in these growing areas, refinements to the network may be required. The recommendations set forth in the plan update do not preclude modifications to the depicted network that may result from further detailed assessments associated with future PAD applications. Accordingly, modifications to the network contained in approved PAD documents will be deemed incorporated by reference into the plan.

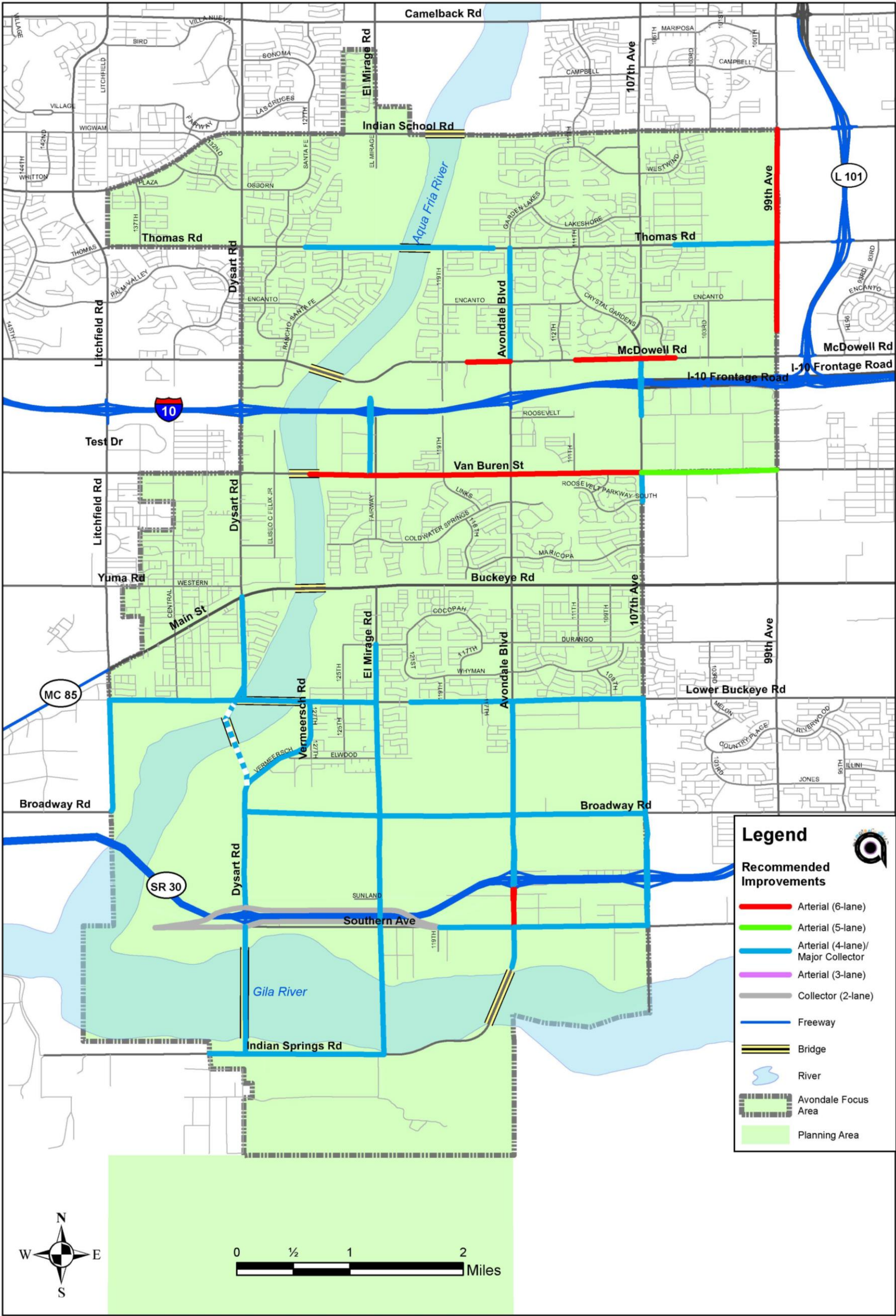
While the street system is an integral part of the transportation network, roadways should be constructed to accommodate all travel modes, including bicycle, pedestrian, transit, in addition to the automobile. Subsequent chapters of this transportation plan provide guidance for other methods to develop an optimal, fully integrated transportation system in the City of Avondale through implementation of a bicycle plan, transit plan, and ITS infrastructure plan.



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Figure 4.12 Recommended Roadway Improvement Projects through Year 2040



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.

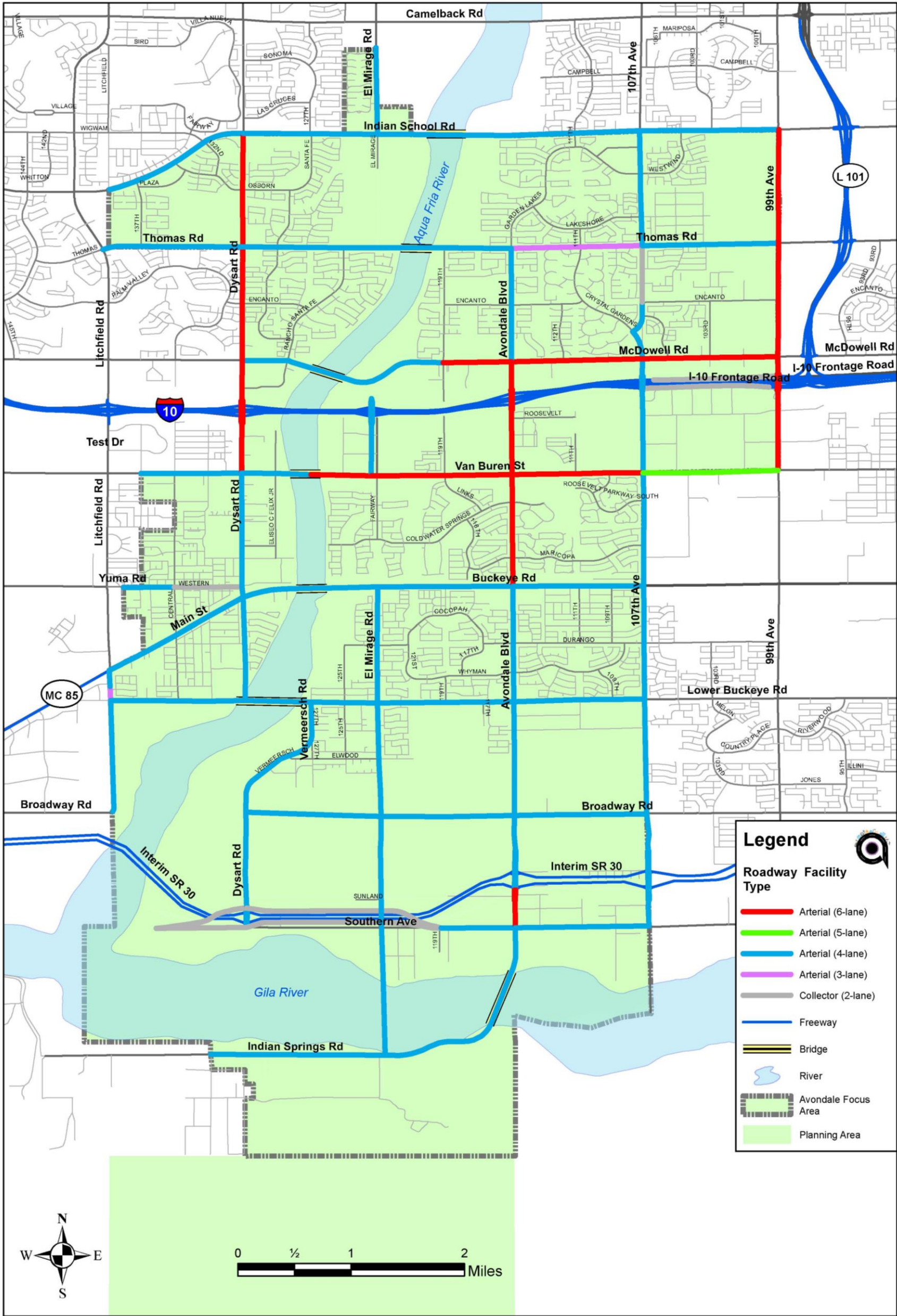




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Figure 4.13 Recommended Year 2030 Roadway Plan

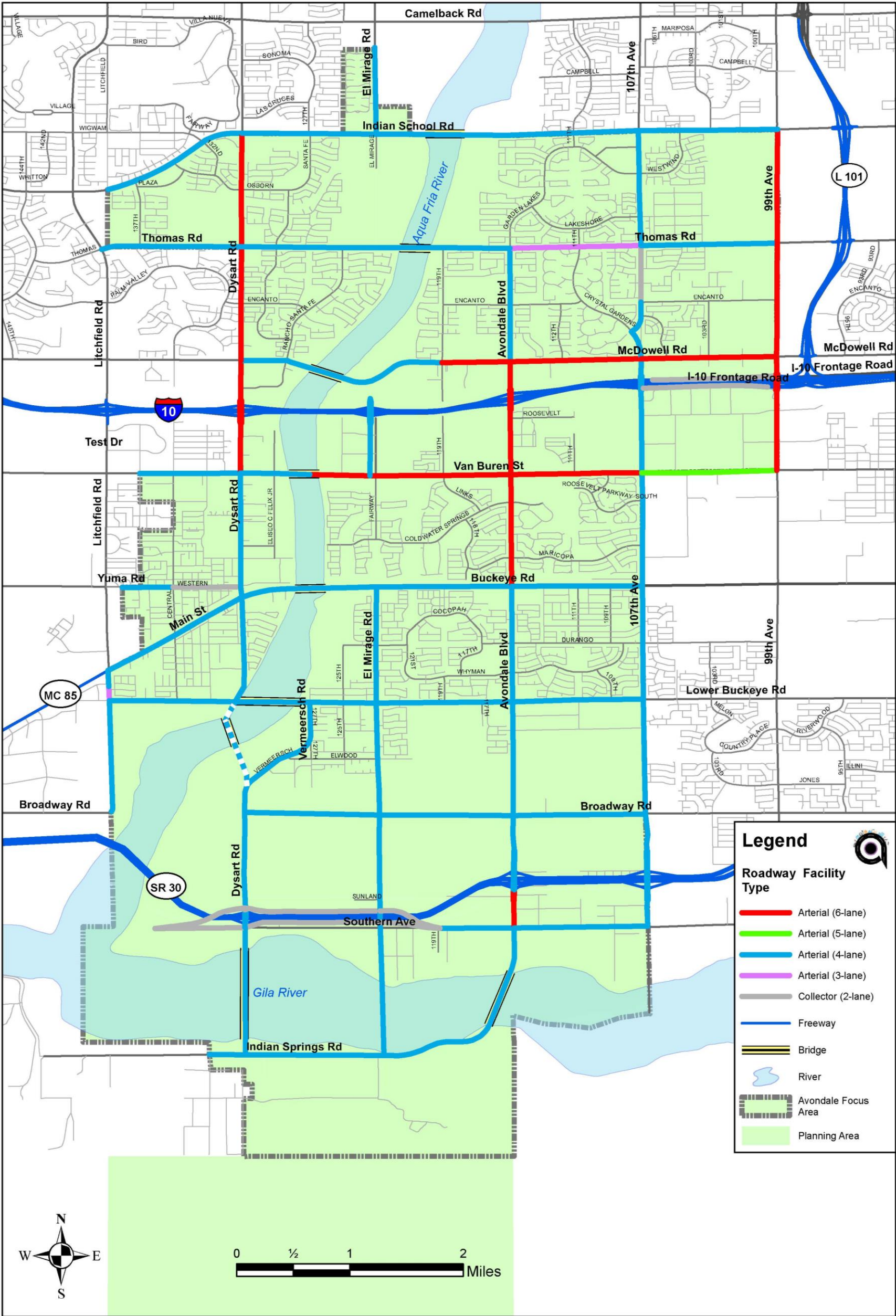




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Figure 4.14 Recommended Year 2040 Roadway Plan



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.



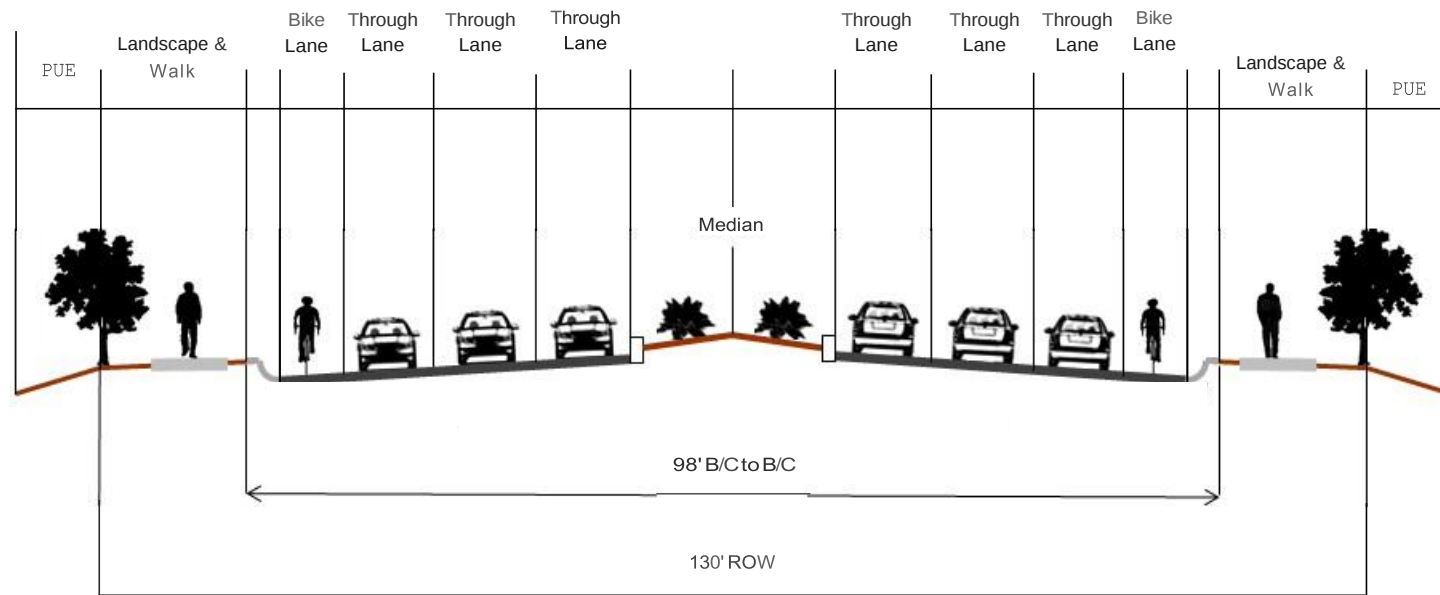


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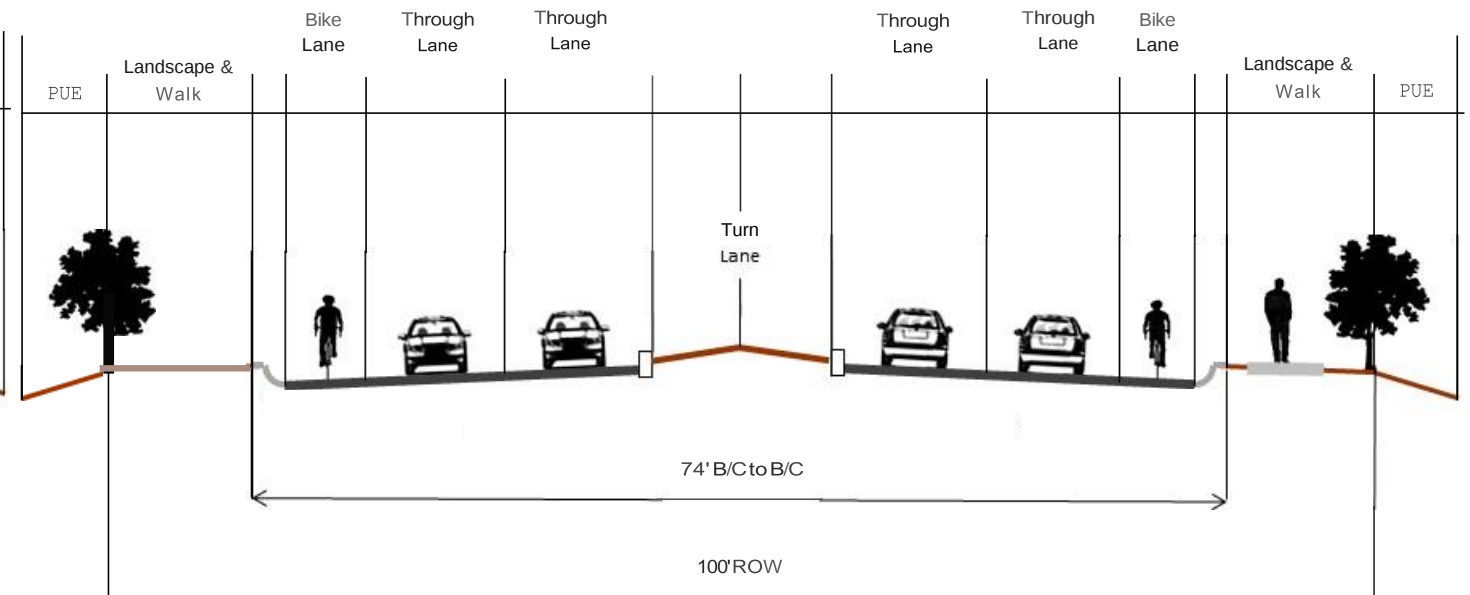
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Figure 4.15 Roadway Cross-Sections

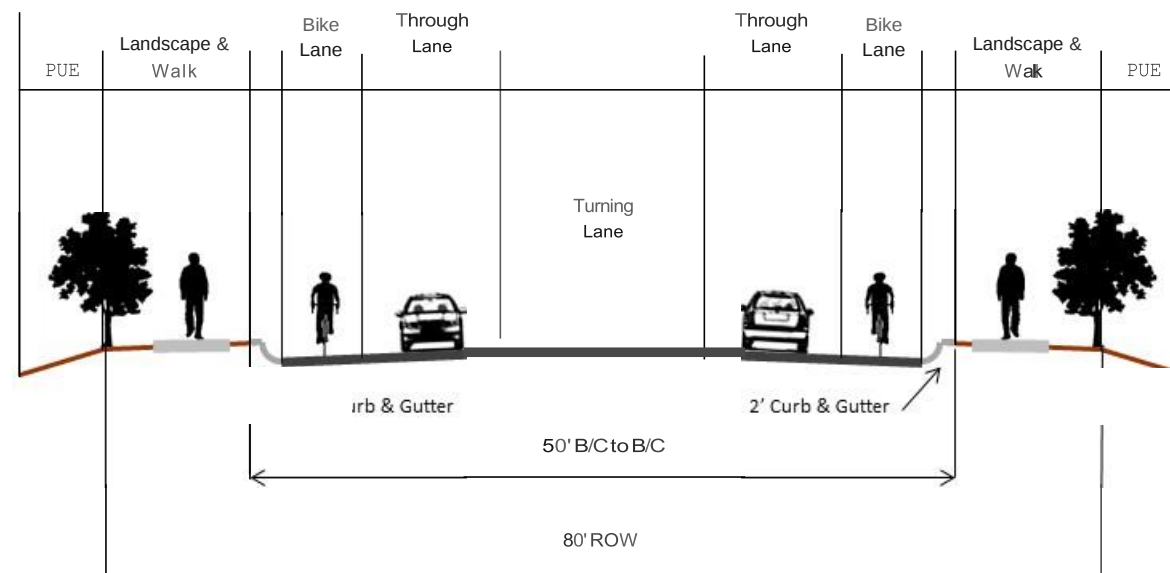
6-Lane Arterial - 130' Right of Way



Minor Arterial - 100' Right of Way



Collector - 80' Right of Way





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recommended truck route plan

As previously identified, the City's existing truck routes were designated as such to mitigate heavy truck traffic generated by commercial, mining, and industrial practices in corridors the quality of the roadways could be negatively impacted and travelers safety could be adversely affected. Identifying potential future truck routes should maintain these principles as well as consider the impact that increased truck traffic might have on network performance for all adjacent roadways – as limiting the designation of truck routes typically provides the benefit of reducing congestion levels along arterials.

The presence of existing truck traffic in the City falls into two categories:

1. Commercial delivery trucks transporting freight orders to local businesses within the City, or
2. Heavy trucks generated by the mining/warehousing/industrial business focused along the Agua Fria and Salt Rivers.

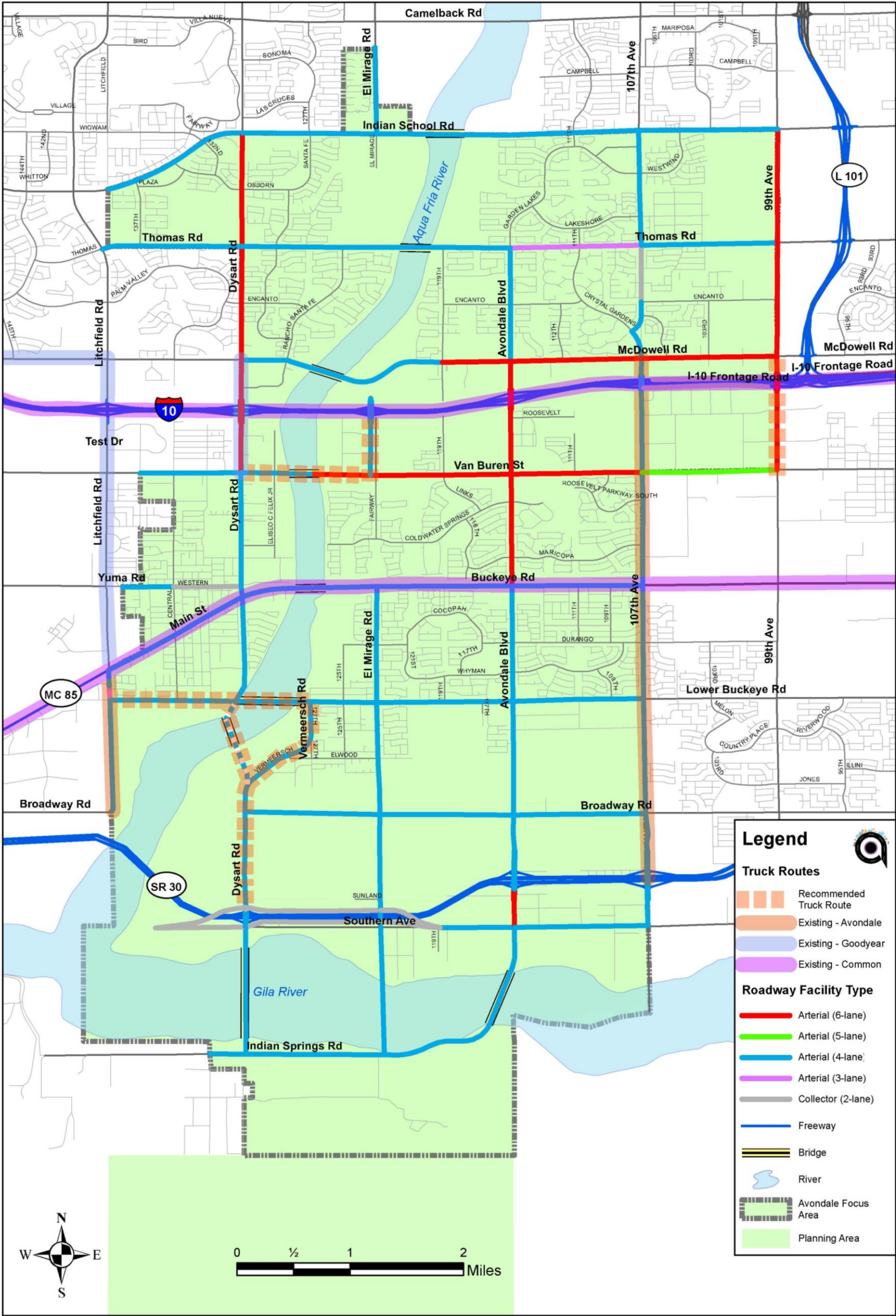
While the City does not designate an east-west truck route, Buckeye Road/MC-85, as an RRS, can likely accommodate truck traffic needs in the future, due to its county road class. The City of Goodyear has designated Litchfield Road as a truck route, and Litchfield Road is in the vicinity of Avondale's truck-generating commercial activities. Therefore, designating an Avondale truck route that provides connectivity to this existing Goodyear route is recommended. Furthermore, the City of Phoenix has designated all major arterials adjacent to Avondale as truck routes. Based on balancing the trucking needs within Avondale, preserving local traffic priority, forecasting needs of future land uses and socioeconomic growth factors in specific areas of the City, and anticipating future connectivity to the region via new freeway interchanges, the future recommended truck route plan is depicted in Figure 4-16.



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Figure 4.16 Recommended Truck Route Plan



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.





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street plan recommendations

The following summary of recommendations is intended to provide guidance for future planning and improvement programming purposes:

- Include identified projects in the Capital Improvement Program (CIP) prioritization process to determine the appropriate timing and phasing of recommended improvements.
- Adhere to standard cross-sections and abide by MAG guidelines for developing Complete Streets, when expanding or adding new roadway infrastructure to ensure maximized benefits from expended improvement funding.
- Assess the status of right-of-way availability along the recommended roadway network presented in Figure 4-13 and Figure 4-14. Begin long-term acquisition process for major roadway classifications.
- Work with future developers to establish/designate/preserve future roadway rights based on the recommendations contained in Figure 4-13, particularly in the expanding areas-of-way south of Lower Buckeye Road, and ensure adherence to established cross-sections for the extension/widening of existing roadways and corridors to promote multimodal connectivity.
- Perform due diligence investigations and pre-design for at least one future bridge crossing of the Agua Fria River associated with the widening/improvement of Lower Buckeye Road's existing two-lane, low-water crossing (preferred) and/or the extension/connection of Dysart Road.
- Take advantage of partially improved corridors/segments to complete gaps within the roadway network and/or multimodal networks within the City.



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5. transit plan

An integrated local and regional public transit system, ultimately supported by a network of “Complete Streets,” will accommodate a portion of the City’s future travel demand in an affordable and environmentally friendly manner. The 2017 Transit Plan for the City of Avondale builds on previous Transit Plan presented in the City’s General Plan 2030, Transportation Plan, and Transit Implementation Plan. This plan continues a theme in the City’s goals to provide a multi-modal transportation system that supports the land use element. The creation of transit hubs and multimodal travel corridors will ensure that transit services are accessible to City residents, opening greater opportunities for employment as well as social and recreation activities outside of the City. Improving transit connectivity with adjacent municipalities and the region, in turn, enhances opportunities for non-residents to reach employment and activity centers within the City. To this end, a core philosophy of transit-oriented streets and development has been a primary guide for evolving transit services through this 2017 Transit Plan.

relevant local and regional transit plans

The following plans, studies, and other documents were reviewed for context and preparation of this Transit Plan Update.

avondale transit implementation plan (september 2015)

This Plan picks up where the Southwest Valley Local Transit System Study (SWVLTSS) left off. The Implementation Plan focused on the specific needs of Avondale and development of sub-regional connectivity for the City. It aimed at refining the various transit concepts outlined in the SWVLTSS. It provides more detailed cost estimates and specifies capital requirements associated with a vehicle fleet, passenger facilities, service needs, location of facilities and other needs of a future transit system.

The Implementation Plan recommended a ZOOM North Neighborhood Circulator, extension of Route 29 to the Avondale Civic Center, and a new Route 131 to be operated on Dysart Road between Indian School Road and Lower Buckeye Road. It also recommended some “early action improvements,” including: transportation demand management (TDM) strategies; engaging City residents in Valley Metro Commute Solutions through sharetheride.com, which connects employers and employees in commuting options; promoting sharetheride.com to support connectivity with destinations not available through the transit system.

The Implementation Plan also investigated funding solutions to assist in development of the proposed transit improvements. It is expected that the improvement recommended in the Implementation Plan will aid in meeting internal circulation needs of the City and actively move towards improving regional connectivity as funding becomes available.



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southwest valley local transit system study (may 2013)

The purpose of this MAG-sponsored Southwest Valley Local Transit System Study (SWVLTSS) was to identify opportunities and strategies for improving the existing transit service in the Southwest Valley and develop a short-, mid-, and long-range transit development plans to effectively provide circulation within the Southwest Valley and establish connectivity with the regional transit system. The study area included portions of the City of Phoenix, City of Avondale, City of Goodyear, City of Tolleson, City of Litchfield Park, Town of Buckeye, and surrounding unincorporated portions of Maricopa County.

Short-Term Recommendations

Short-term actions could occur within the next two to seven years, contingent on funding availability but largely in advance of any major funding initiative like a sales tax. Generally, these actions emphasize reducing travel times, expanding services to meet needs, and building a collaborative foundation for long-term, subregional efforts like expanding the arterial grid system into the service area. Specific recommendations relating to Avondale included:

- Improving service on existing arterial fixed routes along McDowell Road (Route 17A) and Van Buren Street (Route 3) to 30-minute headway and interlining routes or expanding hours of service. This has been implemented with full service on Route 17 and Route 30 now operating at headways of 20 to 40 minutes.
- Building on the success of the ZOOM circulator by increasing service area to the north and/or increasing capacity. This recommendation is incorporated in the Avondale Transit Implementation Plan (ATIP), September, 2015.

Mid-Term Recommendations

By 2020, service improvements are recommended in areas that are projected to support productive transit (i.e., meeting accepted performance metrics) at that time. It is also recommended that the performance of transit service be reviewed periodically to determine if modifications are required to respond to changes in actual pace and type of development. Specific recommendations relating to Avondale included:

- Introducing 30 minute north-south fixed route service on major arterials such as Litchfield and/or Dysart Roads.

Long-Term Recommendations

Over the long-term, the transit system would be built out to levels that are projected to be transit supportive, based on current land use plans. The timing for long-term recommendations will be contingent on funding availability and realization of the projected pace of development. Implementation steps include expansion of more services into the central portion of the service area and continual refinements to service to meet or exceed transit service performance goals. Specific recommendations relating to Avondale included:

- Expanding the service area for arterial fixed route transit service farther west.
- Improving service frequencies as appropriate on productive routes.



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- Identifying opportunities for flexible service (such as route deviation or demand responsive, non-ADA service that is reservations-based or that serves specific activity centers).
- Continuing to modify circulator routes or operations to respond to changes in conditions.

transportation plan update, final report (november 2012)

This plan document represents an update/continuance of the Transportation Plan for the City of Avondale (TransPlan Update) adopted by the City Council in October, 2006. TransPlan Update included a description of the existing transit systems and presented a 2030 Transit Plan focused on creating a transit system with four classes of transit service: High Capacity Transit (HCT)/Premium Transit Quality, Major Transit Quality, Express Bus, Local/Circulator/Feeder. Because it was oriented to responding to the future-year focus of the City's General Plan (2030), short- and long-term improvements were considered together. A map showing recommended transit services for Avondale was included. Four specific types of transit services, or functions, were defined within the short-/long-term perspective adopted for the TransPlan Update:

- **High Capacity Transit/Premium Transit Quality** – Three HCT services were recommended that would “...cater to longer trip lengths, offer higher quality and higher capacity service, and provide significant regional connectivity.” This type includes Commuter Rail (CR) along the UPRR’s Yuma West (Wellton Branch) line [as part of the regional plan]; light rail transit (LRT) along “...a corridor integrated with the City Center development (and generally paralleling Van Buren Street/McDowell Road)... [as an extension of the existing Metro Light Rail in Phoenix];” and bus rapid transit (BRT) on the I-10 [as part of the regional Valley Metro system].
- **Major Transit Quality** – The Plan identified “...bus (or streetcar) on major arterial streets with a range of service enhancements possibly based upon application of traffic priority measures (e.g., traffic signal priority, queue jumpers). Recommended streets for this type of transit service were identified as: Indian School Road, McDowell Road, Van Buren Street, Buckeye Road, Dysart Road (Western to Indian School), Avondale Boulevard (Lower Buckeye to McDowell), and 99th Avenue.
- **Express Bus** – This service would be non-stop or minimum stop bus-on-freeway services, typically including local pick-up/drop-off in addition to stops at park-and-ride (P&R) facilities. This type of transit services cater to longer trip lengths and offer high quality, high speed service, but with connectivity typically oriented to downtown Phoenix, although any major activity center could be the focus of Express Bus service.
- **Local/Circulator/Feeder** – These locally-oriented bus services provide neighborhood mobility, community mobility and connectivity with local origins (e.g., residential areas) and key destinations (e.g., shopping center, hospitals). Demand response (i.e., Dial-a-Ride) services are part of this transit category. These services generally are associated with lower productivity and performance, as they typically cater to short, non-work trips, and intracommunity trips, and they also are more labor intensive. Nevertheless, these services provide a useful feeder function to other bus services.



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The TransPlan Update also established the basis for Terminal/Stop facilities, including transit centers, P&R lots, transit stations, and bus stops (with and without amenities, such as shelters). It identified four potential focal points for transit services: Transit Center within the City Center (which has been completed); two HCT stations, one at the existing Transit Center/P&R in Goodyear near Dysart and McDowell roads, and a second (future) facility at 99th Avenue and Thomas Road to serve as an interim terminal for I-10 West HCT service; a further facility was identified as an eventual bus transfer and P&R facility on the UPRR corridor at Avondale Boulevard to support the future CR service on the UPRR Yuma West (Wellton Branch) line (as noted above).

avondale general plan 2030 – healthy sustainable community (august 28, 2012)

The General Plan 2030 includes a Circulation Element, a Bicycle Element, and TOD Element. The Plan notes:

The City currently provides transit alternatives for residents and visitors. However, the City needs to foster new opportunities to include transit-centered development within its borders. The Transit Oriented Development Element of the 2012 Plan focuses on expanding transit options and specifically discusses and identifies development compatible land uses. Providing for alternate modes will have different emphasis to regional, citywide, local, and neighborhood transportation planning and should be developed to those contexts.

It includes goals and specific policy statements regarding transit services and development and improvement of those services, including:

- Develop linkages to a regional and local rail and transit consistent with the Land Use Plan to foster TOD.
- Encourage land development patterns that promote the appropriate use of existing and proposed transportation facilities, such as near the Avondale Transit Center at City Center (completed January, 2014).
- Continue to develop strategic partnerships with ADOT, MCDOT, MAG, and RPTA for regional projects and systems that benefit the community.
- Partner with MAG and West Valley municipalities to further the Sustainable Transportation and Land Use Integration Study (STLUIS) for future BRT and other modes of transportation.
- Encourage the sustainability and enhancement of transit service within the City by implementing a long-range transit plan (this Transit Plan 2040 responds to this policy statement).
- Seek funding opportunities for future BRT and other modes of transit infrastructure, including
- Full development of the Avondale Transit Center at City Center (completed in January, 2014).

The General Plan 2030 also includes a goal to “Develop a safe bicycle transportation system that provides connectivity throughout the City, including major public and private facilities, and to transit.”

The TOD Element asserts increasing transit access is a key strategy to creating healthy communities. Policy statements associated with the goals to enhance public transit options include:



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- Enhance bus service throughout the City and build upon existing Avondale “Zoom” Circulator route that include regional and subregional routes within transit-oriented development.
- Coordinate with Valley municipalities, MAG, and Valley Metro/RPTA through MAG to bring commuter rail to Avondale along MC 85/Buckeye Road.
- Designate a light rail/transit corridor between Van Buren and McDowell Road along the I-10 Freeway (the I-10 West LRT line is being extended to 79th Avenue at this time).
- Designate a future location for a P&R facility in Avondale.
- Explore potential opportunities for transit associated with the development of SR-30.
- Continue and support planning efforts related to full development of the Avondale Transit Center at City Center (completed January, 2014).

annual report on the implementation of proposition 400 (september 2016)

The most relevant aspect of this annual report to future Avondale transportation improvements potentially related with future transit service was the statement regarding SR-30 (I-10 Reliever). Development of this new transportation facility remains within the FY 2035 planning horizon and is planned around FY 2022-2023. Also, the Avondale Express Bus service is slated to start service in FY 2020. The Annual Report also recognized that balancing the Transit Life Cycle Program (TLCP) over the past several years has resulted in delaying “...implementation of numerous projects and reducing the scope of many other projects.” A higher fund balance will allow Valley Metro to work with its members and MAG to focus on implementing delayed improvements.

2035 regional transportation plan (december 2013)

The public transit element of the Regional Transportation Plan (RTP) contained plans and programs for continuing expansion of regional bus service and LRT facilities. The regional transit system includes: local services, mostly funded through local revenues; regional grid services; BRT/express services; high-capacity transit (HCT) corridors, such as LRT and commuter rail; and rural connector routes.

Local and Circulator Bus Services.

Local and circulator bus routes in the RTP’s 2035 Bus Service Network are shown on major arterials within the City:

- **Local Bus Routes on East-West Arterials (from north to south)** – Indian School Road, continuing through to Litchfield Park; Thomas Road, stopping at 107th Avenue; McDowell Road, continuing through to Litchfield and beyond; Van Buren Street, continuing through to Goodyear; and Buckeye Road, continuing through to Buckeye.
- **Local Bus Routes on North-South Arterials (from west to east)** – Litchfield Road, between Lower Buckeye Road and Bell Road in the City of Surprise; and 99th Avenue, between Buckeye Road and Bell Road in the City of Surprise.
- **Circulator Bus Routes** – The ZOOM Circulator is shown as described earlier in this chapter.

Regional Super Grid Bus Services

The regional super grid services are planned for these seven arterial streets in the Avondale area:



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- Five East-West Arterials (from north to south) – Indian School Road, continuing through to Litchfield Park; Thomas Road, stopping at 99th Avenue; McDowell Road, stopping in Litchfield Park; Van Buren Street, stopping in Litchfield Park; and Buckeye Road, stopping in Litchfield Park; and Lower Buckeye Road Loop, Dysart Road to Avondale Boulevard.
- Three North-South Arterials (from west to east) – Litchfield Road, between Lower Buckeye Road and Bell Road in the City of Surprise; Dysart Road, between McDowell Road and Camelback Road, and along Dysart Road between Buckeye Road and Lower Buckeye Road; and 99th Avenue, between Buckeye Road and Bell Road in the City of Surprise.

Regional Express/LINK Services

The RTP proposes two BRT routes along the I-10 West freeway corridor: the Buckeye-Downtown Express and the Goodyear-Downtown Express. Both of these routes plus are in operation today as a precursor to expanded services in the future. The Avondale Express, which was operational as of the previous 2010 RTP but not today, has been eliminated from the 2035 RTP.

Light Rail Transit (LRT)/ High-Capacity Transit (HCT) Extensions

Two HCT corridors were identified in the 2006 RTP that would serve Avondale: one a westward extension of the I-10 West LRT; and, the second, CR service along the UPRR Yuma West (Wellton Branch) corridor. These service are no longer shown on the HCT plan in the 2035 Update. However, commuter rail planning has targeted the UPRR corridor for future consideration, as witnessed by completion of the Yuma West Corridor Development Plan (discussed below).

Park-and-Ride Facilities/Transit Centers

The 2035 Update does not include additional regionally-financed P&R facilities or transit centers within the city limits of Avondale. The Avondale Transit Center project at City Center was part of the 2010 RTP and was completed January, 2014.

regional transportation plan (2010 update)

The public transit element of the RTP Update contained plans and programs for continuing expansion of regional bus service and LRT facilities. The regional transit system includes: local services, mostly funded through local revenues; regional grid services; BRT/express services; HCT corridors, such as LRT and commuter rail; and rural connector routes.

Local Bus Services.

The local bus routes in the RTP's 2030 Bus Service Network are shown on major arterials within the City:

- East-west arterials—(from north to south) Indian School Road, Thomas Road, McDowell Road, Van Buren Street, Buckeye Road, and Lower Buckeye Road.
- North-south arterials—(from west to east) Litchfield Road, Dysart Road, Avondale Boulevard, and 99th Avenue.

Regional Grid Bus Services

The regional super grid services are planned for these seven arterial streets in the Avondale area:

- Three north-south arterials—(from west to east) Litchfield Road, Dysart Road, and 99th Avenue.



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- Five east-west arterials—(from north to south) Indian School Road, Thomas Road, McDowell/McKellips Roads, Van Buren Street, and Buckeye Road.

Express/Bus Rapid Transit (BRT) Services

The RTP proposes two BRT routes along the I-10 West freeway corridor: the Avondale Express and the Goodyear-Downtown Express. Both of these routes plus the Buckeye-Downtown Express are in operation today as a precursor to expanded services in the future.

Light Rail Transit (LRT) Services/High Capacity Transit (HCT)

The two HCT corridors identified in the 2006 RTP in Avondale, one a westward extension to the I-10 West LRT and the second along the UPRR Yuma West (Wellton Branch) corridor are not shown on the HCT plan in the 2010 Update. However, commuter rail planning has targeted the UPRR corridor for additional planning as witnessed by completion of the Yuma West Corridor Development Plan, as discussed below.

Park-and-Ride Facilities/Transit Centers

There are no regionally financed park-and-ride facilities or transit centers proposed in the draft RTP within the city limits of Avondale. However, the City expects the work being done as part of the Avondale Transit Center project at City Center will be part of the RTP based upon its location, land use densities, and future transit needs.

yuma west commuter rail corridor (may 2010)

The Yuma West corridor is designated as an “eligible high capacity route” by the Regional Transportation Plan. The corridor would assume future use of the existing UPRR Yuma West (Wellton Branch) right-of-way for high capacity transit (i.e., BRT, LRT, or commuter rail). While not scheduled for transit development, the RTP recognizes that the corridor is an urban linear right-of-way opportunity that should be preserved for future transit. Re-establishment of a rail connection, i.e., the Wellton Branch, between the Phoenix metropolitan area and Yuma would be one of many steps needed to support the “Golden Triangle” vision of interconnecting Phoenix, Los Angeles, and Las Vegas via high-speed rail. Potential byproducts of this overall vision would be additional opportunities for passenger rail service, assistance with commodity distribution, and manufacturing at the State level.

Advance planning for the corridor has been initiated with completion of the Yuma West Commuter Rail Corridor Development Plan (May 2010). The study involved an evaluation of the practicality and potential cost-effectiveness of using the existing UPRR right-of-way for CR service. The corridor segment extended 44 miles from downtown Phoenix to Arlington (14 miles west of Buckeye), passing through Avondale.

Proposed Avondale Station

Within Avondale one station was included in the corridor development plan at Avondale Boulevard and Buckeye Road. The concept for the station proposed these functions be included: park-and-ride, kiss-and-ride, and bus transfer bays. Two adjacent stations would be three miles away: one at 91st Avenue and Harrison Street (Tolleson) and one at Litchfield and Buckeye Roads (Goodyear Airport).



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Thus, the southern part of Avondale would be well-served with high-speed, high-capacity commuter rail service connection to downtown Phoenix.

From the Avondale station the estimated trip time, including station dwell times, would be about 30 minutes. Ridership forecasts (year 2030) for the Avondale station ranged from 40 to 350 depending upon how the commuter rail line would be interlined with other possible commuter rail line in the region. The combination of the three stations (Goodyear Airport-Avondale-Tolleson) resulted in boarding estimates ranging from 240 to 880. In most of the scenarios tested the Goodyear Airport station had more boardings projected than the other two stations.

Proposed Operating Plan

The proposed operating plan for the line would entail three stages, with an initial stage of 30-minute headways in the weekday peak periods to Buckeye (30 miles from downtown Phoenix). The second phase would add off-peak service to the same line. The ultimate plan would have 30-minute peak headways, 60-minute off-peak headways, and extend service to Arlington west of Buckeye.

Commuter Rail Supportive Efforts

Related to the UPRR corridor, City policy and planning efforts should focus on preserving the right-of-way for transportation purposes and circulating a land use plan for the entire length through the City. Within the targeted station areas (especially around Avondale Boulevard and the Litchfield Road-Dysart Road segment) various policy and planning steps should be scheduled:

- to work with the City's regional transportation partners to identify the specific right-of-way needs for a high capacity transit route and associated station areas, and ensure (through policy actions) that any future development would not encroach on this right-of-way.
- to identify suitable parcels for the station sites and related transit/access functions.
- to facilitate land use and urban design actions—to be adopted as part of the City General Plan 2030, and included in subsequent planning and zoning documents—that would be supportive of future transit usage.

regional transportation plan (2006 update)

The 2006 Regional Transportation Plan (RTP) identified two HCT corridors in Avondale: one a westward extension of the I-10 West LRT corridor (i.e., from the vicinity of 79th Avenue) to the vicinity of Avondale Boulevard, and a second along the UPRR Yuma West (Wellton Branch) corridor through Avondale to Buckeye. In the RTP, both corridors were identified as “eligible high capacity corridors.” The RTP allocated funding for corridor studies in order to evaluate the potential cost-effectiveness of commuter rail in existing railroad corridors, such as the UPRR.

existing public transportation services

The existing transit system for Avondale is comprised of regularly scheduled transit routes, a neighborhood circulator (Avondale ZOOM), Express Bus service through the Avondale Park-and-Ride (P&R) facility, regional connector service, and accessibility/mobility services for persons with disabilities and other special needs (known as “Paratransit”). Arrangements with the Regional Public



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Transportation Authority (RPTA), through its operating arm Valley Metro, and the City of Phoenix support continuing development and promotion of a wide variety of alternative travel modes, including not only regular bus and Paratransit services, but also carpools, vanpools, and bicycles. Although, no public rail (light or heavy) service is available in the City at this time, planning to secure access to these modes is continuing through the long-range regional planning activities of MAG.

existing transit routes

Transit service in Avondale is provided primarily by Valley Metro and the City of Phoenix. The service consists of scheduled, fixed-route bus service, circulator, express bus service, Paratransit, and medical taxi. Each of these services presents City residents with viable options for travel within the City and to destinations outside the City. At this time, the preponderance of service is offered with an east-west orientation with the exception of the Avondale Zoom, which provides connectivity from Thomas Road to Lower Buckeye. Figure 5.1 presents a map of the current route structure of transit system serving Avondale. The following sections provide a description of the existing transit services.

scheduled fixed-route bus service

Funding shortfalls, resulting from impacts of the Great Recession, required Valley Metro to reduce bus services throughout its operating area. Current scheduled fixed-route bus service provides east-west service through the City, leaving north-south mobility still a significant deficiency. Today, although the number of routes serving the City has been reduced, the service on remaining routes have been improved with shorter headways (i.e., time between arrivals/departures from a designated point) and longer operating hours. Currently, the City is served by three routes.

Route 41 – Indian School

This route, which serves the northeast corner of the City at 107th Avenue and Indian School Road, previously operated at a 60-minute headways. The route now operates on a 40-minute headway during the day with headways of 20 minutes during peak periods and 30 minutes during the early morning, evening, and late night. It runs along Indian School Road to Granite Reef Road in Scottsdale between the hours within the City of 4:07am (Eastbound-EB) and 1:12am (Westbound-WB) on weekdays, with special extended hours on Friday. It connects with Route 75, 75th Avenue, to provide access to the Desert Sky Mall and the Desert Sky Transit Center. The Transit Center supports connections among the following routes: Route 29 – Thomas Road, Route 75 – 75th Avenue, Route 83 – 83rd Avenue, Route 685 – Ajo/Phoenix Connector, Route I-10 West RAPID, and Phoenix Neighborhood Circulator – MARY.

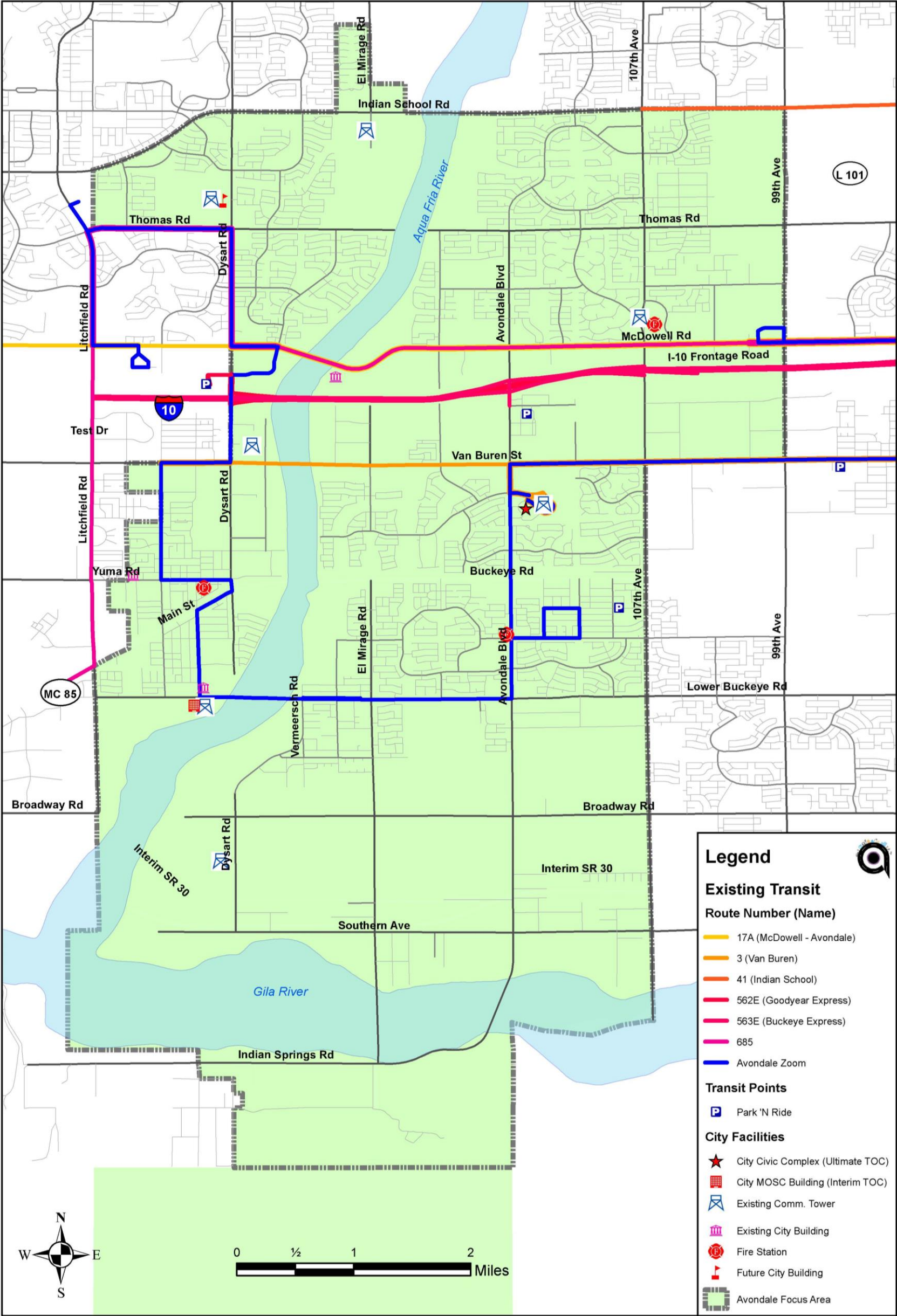
Weekend service on Route 41 also is quite extensive, beginning on Saturday at 4:50am (EB) and ending at 3:24 am (WB). Sunday service is similar, except that service ends earlier at 12:24am.



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Figure 5.1 Existing Transit System Serving Avondale





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Route 17 – McDowell Road

This route operates along McDowell Road from west of Avondale to Pima Road in Scottsdale. Service through the Sky Song Transit Center in Scottsdale supports connection with Route 72 – Scottsdale Road, which provides direct travel to the Tempe Transportation Center and the Arizona State University (ASU) Main Campus in Tempe, as well as travels north into Scottsdale and south into Tempe along Rural Road. The route operates today on a 40-minute headway during the day with 20-minute headways during peak periods. Operating hours within the City are limited to 5:14am (EB) to 7:35pm (WB) on weekdays, which can constrain travel for those who desire to attend evening classes at ASU. Route 17 also provides connections with the Avondale ZOOM Neighborhood Circulator at Dysart Road. Operating hours on Saturday are similar with only slight variations. No route service is provided through the City on Sunday.

Route 3 – Van Buren Street

This route operates along Van Buren Street from west of Avondale to the Phoenix Zoo with a route deviation into the Avondale Civic Center. It provides a connection with the Avondale ZOOM Neighborhood Circulator within the Center. Route 3 generally maintains a 30-minute headway throughout the day, with service being provided between 5:17am (EB) and 8:52pm (WB) on weekdays. However, eastbound service continues until 9:44pm. Weekend service on Route 3 begins on Saturday at 4:58am (EB) and ends at 7:55pm (WB). Sunday service is similar, except that service ends earlier at 12:24am (WB). No route service is provided through the City on Sunday.

circulator service

The Avondale ZOOM Neighborhood Circulator generally connects the Southwest Valley YMCA and Estrella Mountain Community College on Thomas Road in Litchfield Park with the core area of the City and Civic Center with the Gateway Pavilions at 99th Avenue and McDowell Road. Various neighborhoods of the City are served by this route, providing access to shopping, educational, and recreational opportunities. ZOOM connects with Route 17 at three locations: McDowell Road/Litchfield Road, McDowell Road/Dysart Road, and McDowell Road/91st Avenue. It also connects with Route 3 at three locations: Van Buren Street/Dysart Road, Van Buren Street/Avondale Boulevard, and Van Buren Street/91st Avenue. In addition, the ZOOM Circulator also provides a connection at Estrella Mountain Community College with Route 685 – Ajo/Gila Bend to Phoenix, a Regional Rural Connector. Five buses operate through the college on weekdays, and two buses serve the route on Saturday. ZOOM service operates from 5:21am (EB) to 9:15pm (WB) on weekdays at a 30-minute headway. Saturday service is provided between 5:47am (EB) and 6:44pm (WB).

express services

Express Bus service, also referred to as Commuter Bus service, operates during peak travel times with a minimum number of stops, often connecting with P&R facilities and usually operating on freeways. This service may also benefit from dedicated lanes, such as high-occupancy vehicle (HOV) lanes and direct HOV ramps that provide direct access to the HOV lanes. Generally, the vehicles will feature amenities beyond the normal fixed-route buses, such as comfortable single-person seating, lighting, and wireless Internet service. An evolution of Express Bus service is the Bus Rapid Transit (BRT) service.



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RAPID, as it is called by Valley Metro, offers a more direct service, often with even fewer stops, and design features to reduce delays associated with passengers boarding and deboarding and fare collection. The intent of Express Bus and RAPID service is to connect distant locations with key activity centers (e.g., Avondale with Downtown Phoenix) faster than normal fixed-route bus service can provide with its greater number of stops and traffic constraints. Currently, Avondale is served by two Express Bus Routes operating in the I-10 corridor. One RAPID route also operates along I-10; however, it can only be accessed outside the City.

Route 562 – Goodyear Express

This express service routes begins at the Goodyear P&R Express at the southwest corner of Dysart Road and Cornerstone Road and terminates in Downtown Phoenix. This route operates with four trips in the morning between 6:00 and 7:05am and four trips in the afternoon/evening between 4:55 and 6:05pm. The morning service headway is generally 20 minutes, the afternoon/evening headways vary 10 minutes and 30 minutes. The facility provides 400 spaces for vehicles (328 covered) and eight bike lockers.

Route 563 – Avondale/Buckeye Express

This express service, which originates in Buckeye, stops at the Avondale P&R at the corner of Avondale Boulevard and Roosevelt Street and terminates in Downtown Phoenix. This route operates with four trips in the morning through the Avondale P&R between 5:55 and 7:00am and four trips in the afternoon/evening between 5:00 and 6:15pm. The morning service headway varies from 15 to 30 minutes, the afternoon/evening headways vary from 10 to 45 minutes. The facility provides 370 spaces for vehicles (107 covered) and six bike lockers.

I-10 West RAPID

The I-10 West RAPID service offers higher quality express transportation between Desert Sky Transit Center and a P&R, both located on 79th Avenue in Phoenix. This route provides more frequent morning and afternoon peak-period service than the two Express Bus route with buses departing the Transit Center beginning at 5:23am; the latest bus returns to the Transit Center at 6:48pm. Headways vary considerably from 20 minutes to as little as 11 minutes. Both the Desert Sky Transit Center and 79th Avenue P&Rs are well east of Avondale; however, the facilities are relatively easy to access via Thomas Road and McDowell Road, respectively. Therefore, each is geographically positioned to function as a convenient intercept for Avondale residents headed to Downtown Phoenix. The Desert Sky Transit Center offers only 70 vehicle spaces that Avondale commuters can access. However, the 79th Avenue P&R on the south side of McDowell Road offers 607 vehicle spaces for commuters.

route 685 – regional rural connector

This route provides basic public transportation service from Ajo and Gila Bend and the rural area southwest of Maricopa County employment, shopping, education, and medical service opportunities available in the Phoenix metropolitan area. The eastern terminus of Route 685 is the Desert Sky Transit Center with connections available to several local and regional routes (see Route 41 above). Operating through the Estrella Mountain Community College and along McDowell Road, this route offers Avondale residents an alternative to Route 17. The unique “Flex-Stop” Service provided by Route 685



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allows transit patrons to arrange in advance a pick-up and drop-off at locations not included in the regular schedule of stops. Route deviation accommodates service to/from locations considered safe within three-quarters of a mile of the regular route. This Flex-Stop service does require advance notice, but provides a viable alternative for travel direct to Desert Sky Mall and other destinations which is not provided by other routes.

paratransit

Avondale contracts through the City of Phoenix to provide residents with a Dial-A-Ride Service. This service is in compliance with federal regulations. The City of Avondale offers an Americans with Disabilities Act (ADA) Service to eligible persons, who, because of a disability, cannot use Valley Metro fixed-route bus service. Service must be arranged in advance of travel. ADA Paratransit service is available from Phoenix and Valley Metro for residents within three quarters of a mile of operating fixed-route bus service. This, however, limits opportunities for this service to proximity to Routes 3, 17, 41, ZOOM Circulator, and 685.

medical taxi

The City of Avondale provides a voucher program to residents with special transportation needs, such as persons with qualifying physician-ordered repetitive medical treatments and therapy. The participant calls one of a list of participating independent companies to schedule their own rides and the City reimburses the cost of the ride up to a specific dollar amount. Service must be arranged in advance of travel.

existing route performance in avondale

boardings

Valley Metro/RPTA maintains daily, monthly, and annual statistics on the entire regional transit system. Included are data related to boardings by jurisdiction. In FY 2016 (June 30, 2015 – June 30, 2016), there were 315,684 boardings of transit services in the City of Avondale. Valley Metro operated 434,865 revenue miles in support of these boardings, resulting in a ratio of boarding per revenue mile of 0.73. Boardings actually decreased by close to six percent (-5.92%) from the previous fiscal year. Transit services provide in Avondale in FY 2016 attracted 10,905 bicyclists and 1,313 users of wheelchairs. While use of transit by bicyclists declined by 11.01 percent from FY 2015, the number of wheelchair users increased by 4.29 percent.

route ridership

Ridership information is available for the routes serving Avondale and for the specific portion of the routes that are within Avondale. Table 5-1 provides a summary of annual boarding information for all bus routes with stops in Avondale for the last four fiscal years. All routes serving the City directly or available to Avondale citizens except the I-10 West RAPID service have shown an increase in ridership in the past four years. The I-10 West RAPID service experience an almost 30 percent decline in ridership since it was initiated in FY 2014.

The productivity for all fixed-route service supporting transit travel in the City ranged from a high of 3.8 boardings per revenue mile (Route 41) to a low of 0.7 (Route 17 and ZOOM). Productivity of the express



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Table 5.1 Ridership Trend in Avondale: 2013 to 2016

Route #	Description	Boardings				% Change: 2013 to 2016 / ¹	Boardings / Revenue Mile (FY 2016)
		FY 2016	FY 2015	FY 2014	FY 2013		
3	Van Buren Street	66,383	70,732	64,032	62,796	5.7%	0.8
17	McDowell Road	46,845	55,518	34,934 / ²	43,453 / ³	7.8%	0.7
41	Indian School Road	16,244	22,023	9,851	--	165%	3.8
562 Express / ⁴	Goodyear	30,628	21,659	28,593	18,508	166%	20.3
563 Express	Avondale/Buckeye	11,188	6,363	--	--	175%	11.1
I-10W RAPID / ⁵	I-10 Bus Rapid Transit	118,785	143,443	168,914	--	-29.7%	18.9
685 / ⁶	Rural Connector	--	--	--	--	--	--
ZOOM	Avondale Circulator	155,914	164,316	163,263	141,376	10.3%	0.7
TOTAL		155,914	320,230	469,587	266,133	79.7%	--

1/ Change computed for available data.

2/ Includes Routes 17 and 17A.

3/ Includes only Route 17A.

4/ Includes boardings at Goodyear P&R only.

5/ Includes boardings at 79th Avenue P&R only.

6/ No city-specific data available.

Source: Valley Metro Annual Ridership Reports.

routes clearly was much higher, as would be expected. Route 562, originating at the Goodyear P&R produced 20.3 boardings per revenue mile. Route 563, which originates at the Buckeye P&R and only recently has served the Avondale P&R produced 11.1 boardings per revenue mile. This number likely will increase as Avondale residents become more familiar with the P&Rs existence and as additional development occurs in Avondale and Buckeye. Although the I-10 West RAPID had a favorable 18.9 boardings per revenue mile, this service experience a relatively sharp decline (-29.7%) in ridership from its initiation in FY 2014 to FY 2016.

Avondale ZOOM Circulator started in July, 2011; it accommodated about 1,000 riders during its only one week of service in that month. By the end of August, 2011, monthly ridership approached 5,500, roughly equating to 66,000 annual boardings. Currently, in FY 2016, annual ridership exceed 155,000, and the service has remained relatively consistent over the last four years. Boardings per revenue mile of 0.7 on the ZOOM Circulator are comparable with the other City routes.

All routes specifically serving Avondale (3, 17, 41, 563 Express, and ZOOM) have shown fluctuations in boardings over the FY 2013 – FY 2016 period. But, each has experienced growth ranging from five to ten percent. Route 41 – Indian School, in particular, has annual boardings greater 16,000 within the City, which is almost double the number of boardings at initiation of this service in FY 2014. Boardings of the Route 563 – Express Bus also have almost doubled since inception of service to the new Avondale P&R.

park-and-ride

There are four P&R facilities available to Avondale residents: one in Goodyear at the western edge of Avondale, one in Avondale, and two at 79th Avenue in Phoenix.



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avondale p&r

Avondale completed the construction of the City Center Phase 3 and a Transit Center in January, 2014. The Avondale P&R is well-situated just off I-10 on Avondale Boulevard and Roosevelt Street. Improvements included more than 370 parking stalls (107 covered), bus driveways/pull-ins, street and pedestrian lighting, landscaping, shade structures and other amenities. There also are six bike lockers. Transit service from this facility now consists of Express Bus Service to Downtown Phoenix provided via Route 563. The facility is available for use by vanpools and carpools. Current usage of this P&R facility (March 2016 through March 2017) is below 25 percent.

goodyear p&r

The Goodyear P&R is a dedicated facility well-situated just north of I-10 in the northwest quadrant of the I-10/Dysart Road Traffic Interchange (TI) on the south side of Cornerstone Boulevard. The P&R is served by Route 562 – Goodyear Express, providing direct travel to Downtown Phoenix. The facility has 400 parking spaces (328 covered), eight bike spaces, and eight bike lockers. Current usage of this P&R facility (March 2016 through March 2017) is runs around 75 percent.

79th avenue p&r

The 79th Avenue P&R is a dedicated facility located at the southeast corner of McDowell Road and 79th Avenue directly north of I-10. The facility allows direct access to the I-10 via a DHOV on/off ramp to the east. The DHOV ramp at this location also access to the eastbound HOV lane of I-10 and permits returns to the P&R from the HOV lane, when traveling in the westbound direction. There are 607 parking spaces and the facility, which is serve by Route 17 and the I-10 West RAPID. This facility also includes 14 bike space, four bike lockers, and 10 bike racks. Current usage of this P&R facility (March 2016 through March 2017) is runs around 55 percent.

desert sky p&r

This P&R is located at the Desert Sky Transit Center and supports connections among the following routes:

- Route 29 – Thomas Road,
- Route 75 – 75th Avenue,
- Route 83 – 83rd Avenue,
- Route 685 – Ajo/Phoenix Connector,
- Route I-10 West RAPID, and
- Phoenix Neighborhood Circulator MARY.

This P&R has several amenities, including a shelter with benches, water fountains, and trash receptacles. There are 70 vehicle parking spaces at this facility, as well as 11 bike spaces, four bike lockers, and seven bike racks. No information is available respecting usage of this P&R facility.

recommended short-term transit enhancements

The TransPlan Update (2012) of the 2006 Transportation Plan, included a series of recommended transit projects over the short term (2006-2010) and a generalized longer range transit concept for



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implementation by Year 2030. The negative fiscal influence of the Great Recession seriously affected implementation of recommended improvements in transit service spelled out for FY2011-FY2015. Summaries of the recommended short-range projects adopted in the TransPlan Update and discussions of current status is presented below:

- **Extension of Existing Fixed-Route Service to/from the Cities of Phoenix and Glendale** – Routes 3, 17, and 41 were revised, as a result of the Great Recession, from the recommended adjustments in the 2006 Plan to the service currently operated, as described above.
- **Initiation of Two Integrated ZOOM Loop Routes within the City** – The current Avondale ZOOM Circulator serves basic mobility needs of City residents. It connects key shopping, education, and recreation activity centers, and provides access to City offices at the Avondale Civic Center. The routing of ZOOM satisfies previous short-range recommendations to connect the Dysart Road corridor with the Gateway Pavilions shopping area at 99th Avenue and McDowell Road, with service to the Avondale Civic Center, via Buckeye Road and Avondale Boulevard. A second North Neighborhood Circulator is defined in the ATIP. This north loop would be desirable to serve the portion of the City north of McDowell Road and provide direct connectivity with the current ZOOM Circulator route. The route would connect with the current ZOOM Circulator route at the Gateway Pavilions and Palmilla Center in the southeast quadrant of the Dysart Road/McDowell Road intersection (Figure 5.2). The route would operate in a square-like fashion to enhance mobility options within the northern portion of the City and provide greater opportunity for north-south travel, especially by providing access the Avondale Civic Center through connections to the existing ZOOM Circulator route.

Figure 5.2 Proposed ZOOM North Circulator Routing



Source: Figure 12-ZOOM North Circulator Routing. Avondale Transit Implementation Plan. September



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- **Expanded Dial-A-Ride Coverage** – ADA Paratransit services currently are limited to a ¾-mile proximity to operating fixed-route bus or circulator service. Expansion of this service can be accomplished through the Medical Taxi vouchers, but this service has certain constraints on eligibility. Expansion should be initiated through enhancement of the ZOOM North Circulator.
- **Promote Regional Service Connections** – Participation with MAG, and the cities of Phoenix, Goodyear, Glendale and Buckeye potential includes commuter rail service operating through the City along the UPRR Yuma West (Wellton Branch) corridor that parallels Buckeye Road and LRT service extended along I-10 West. The City should continue proactively investigating future opportunities for locating a commuter rail station with P&R along the UPRR alignment through the Avondale. Two new routes have been presented in the ATIP for advancement to more detailed planning. A description of these two routes follows:

Route 29 – Thomas Road

The proposed routing of this new transit service would extend Valley Metro Route 29, which currently begins/terminates at the Banner Estrella Medical Center located at 93rd Avenue and Thomas Road. The extension would run west on Thomas Road to Avondale Boulevard, then turn south to serve the Avondale P&R and have a new beginning/terminating location at the Avondale Civic Center (Figure 5.3).

Route 131 – Dysart Road

This new transit service would begin/terminate at Dysart Road/Indian School Road at the north end and begin/terminate at some point in the vicinity of Litchfield Road/Main Street within a loop at the south end (Figure 5.4). This route would have connectivity with the proposed new ZOOM North Circulator, the current ZOOM Circulator, Route 3, Route 17, and potentially Express Bus services at the Goodyear P&R. Development of this route presumes extension of Route 41 west along Indian School Road, providing connectivity with the regional transit network.

- **Transit Plan Updates and Passenger Amenity Improvements** – Updates to this Transit Plan and continuing review of transit user amenities, including accessibility, safety, and security, will assure continued growth in ridership and resident confidence in alternative mobility opportunities available.

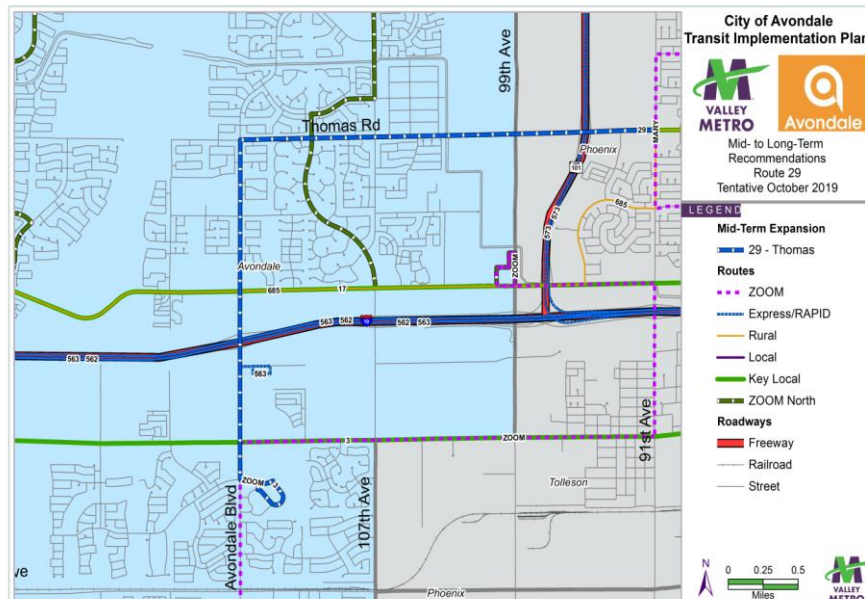
The City has made significant progress by implementing the Avondale ZOOM Circulator, and expansion of circulator-type service in the northern portion of the City would be beneficial for residents. Extension of Route 29 (formerly Route 29A, a heavily utilized service) would be the highest short-term priority. The extension would provide direct connectivity to the regional transit network from the Avondale Civic Center. Connectivity with the current ZOOM Circulator, the proposed ZOOM North Circulator, and Route 17 would enhance transit mobility in the City.



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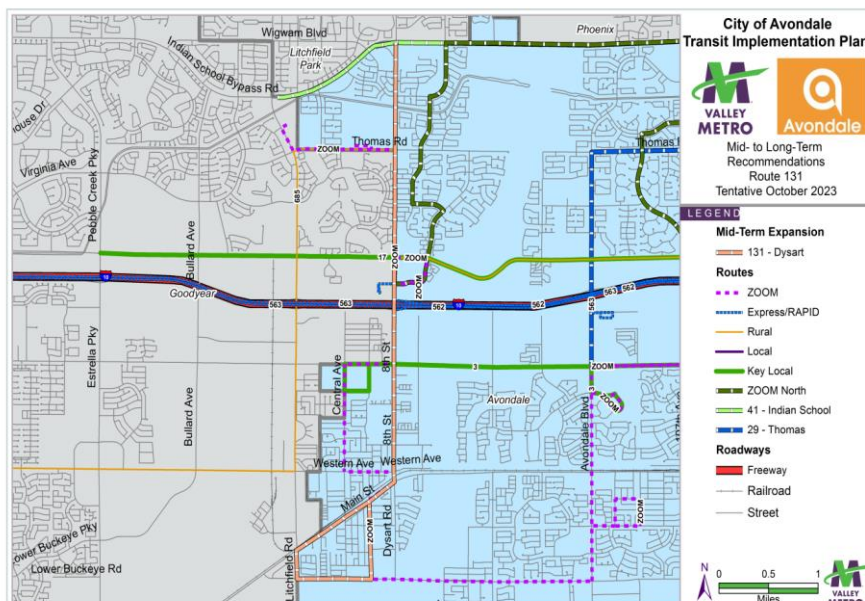
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Figure 5.3 Proposed Route 29 – Thomas Road Extension



Source: Figure 13-Route 29 Routing, Avondale Transit Implementation Plan, September 2015.

Figure 5.4 Proposed New Route 131 – Dysart Road



Source: Figure 14-Route 131 Routing, Avondale Transit Implementation Plan, September 2015.



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In addition to the improvements/enhancements cited above, the ATIP presents an analysis of service identified for implementation in the MAG RTP over the next five years (2015-2020). Figure 5.5 shows the planned transit improvements for Avondale and the relationship of these improvements to the Southwest Valley regional transit network.

Table 5.2 shows the recommended short-term actions presented in the ATIP. An important framework action regarding the short-term plan of action is implementation of Governance Actions, which include: implementing local circulators; establishing necessary coordination to effect expansion of the arterial grid bud system; and linking transit services with land use planning. The proposed short-term improvements focus on East-West Arterial Routes, North-South Arterial Routes, the ZOOM Circulator, and demand response services, as summarized below (refer to Figure 5.5):

East-West Arterial Routes – Existing routes 13 – Buckeye Road, 29 – Thomas Road, and 41 – Indian School Road would not be changed, but connectivity with the ZOOM Circulator service would be established. The short-term plan calls for advancement of the establishment of two new routes: 3 – Van Buren and 17 – McDowell Road; each would operate on 30 minute headways.

North-South Arterial Routes – The short-term plan does not add any north-south service on the City's arterial roads, but looks to the ZOOM Circulator to provide north-south travel connections relative to two routes: 131 – Dysart Road and 139 – Litchfield Road.

Circulators – The short-term plan relies heavily on the circulator service in the City to provide necessary access, connectivity, and general mobility throughout the community. It is recommended that the existing ZOOM Circulator be extended to include a North Loop up to Indian School Road (refer to Figure 5.2). In addition, a pilot route serving Goodyear with connectivity to the ZOOM Circulator, local, and Express Bus services is recommended.

Demand Response/Flex Services – The short-term plan recommends expansion of the DR service to Goodyear along the same routing recommended for the Pilot Route proposed for the Goodyear Circulator.

proposed long-range transit plan

The future transit plan is based on a nominal 20-year time horizon. The Year 2040 is an accepted time point for forecasts of traffic and transportation matters affecting the City of Avondale. This future plan presents general direction for moving forward with transit service enhancements, based on planning and actions of the regional transit system, as defined by MAG and Valley Metro.

basis for high-quality transit service in Avondale

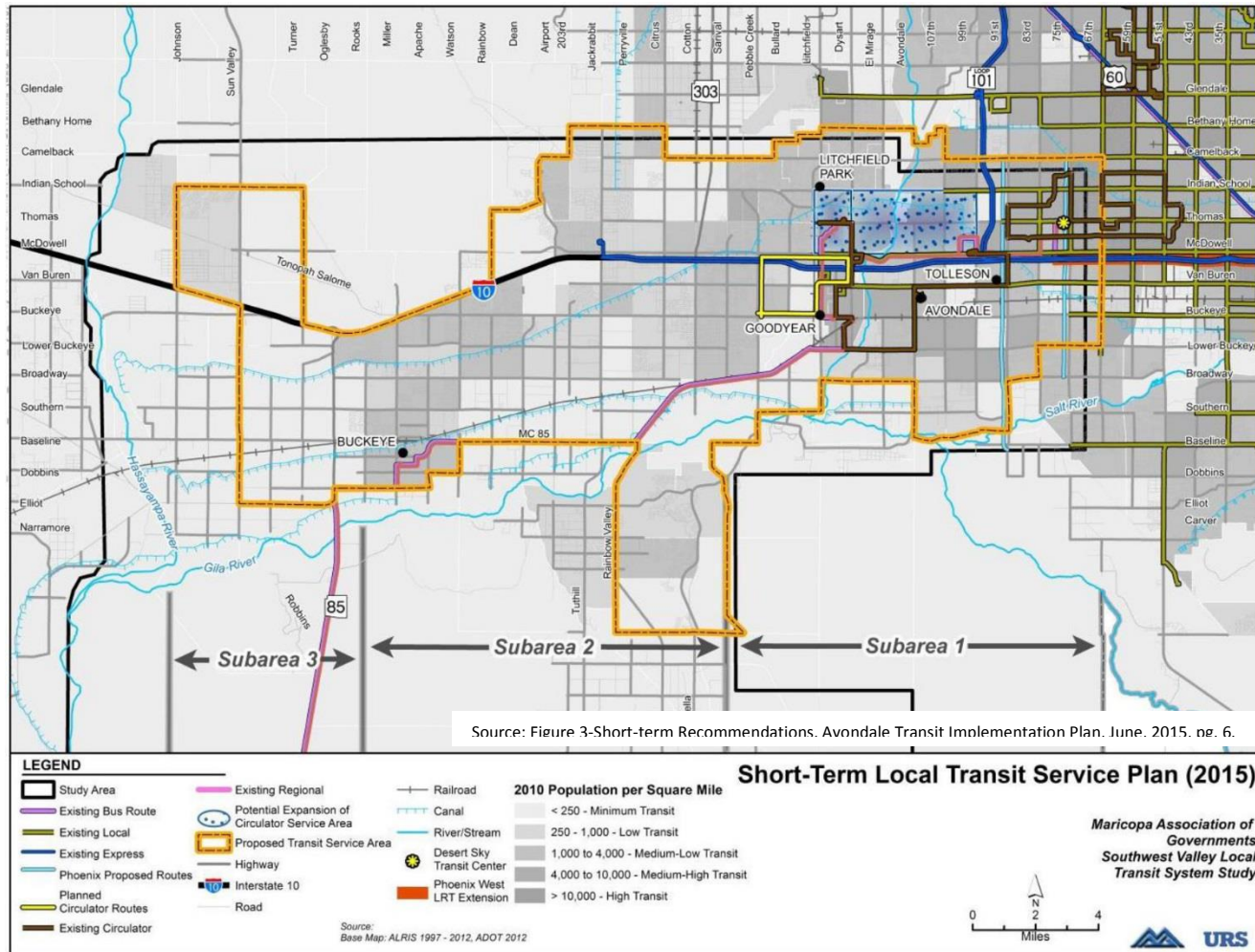
In guiding transit development in Avondale, the importance of a Long-Range Transit Plan as a policy document cannot be overstated. Once adopted as part of this Transportation Plan Update, the Long-Range Transit Plan will provide policy guidance to ensure high-quality public transportation and mobility options are available in the future for the residents and visitors of Avondale. The purpose of the Long-Range Transit Plan is to provide a framework for consideration of funding and programming



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Figure 5.5 Recommended Short-Term Transit Improvements





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Table 5.2 Recommended Short-Term Transit Improvement Actions

	Short-Term
Governance Actions	- Local implementation of circulators - Establish subarea coordination to plan and finance expansion of arterial grid bus system - Link transit and land use in decision-making
East-West Arterial Routes	
McDowell Road (17)	30 min service to Litchfield ²
Van Buren (3)	30 min service to Litchfield ²
Thomas Road (29)	No change Serve area with circulators west of 91 st Ave
Indian School Road (41)	No change Serve area with circulators
Buckeye Road (13)	No change Serve area with circulators
North-South Arterial Routes	
75 th Avenue	No service
83 rd Ave/Southern	No service
91 st Avenue	No service
99 th Avenue/Southern	No service
Litchfield Road (139)	No service Serve area with circulators
Dysart Road (131)	No service Serve area with circulators
Circulators	
ZOOM – Avondale, Tolleson	Expand service coverage (potentially with new loop to north)
Goodyear	Implement recommended pilot route as two-way loop.
Buckeye	Design pilot route.
Flex Services	None
ADA Services	Expand to cover Goodyear circulator pilot route.
NOTES ¹ 60-minute service is noted for these routes because the connecting service is estimated to operate every 60 minutes. 30-minute headway is the desired service level. ² Potential for McDowell and Van Buren routes to be interlined. Since the completion of the SWVLTSS routes 17 and 17A were combined and extended to Pebble Creek Pkwy. in the City of Goodyear. Routes 75 and 83 were launched in the City of Phoenix. A new park-and-ride was built in Avondale and Express Route 563 began serving it. In October of 2015 a new Desert Sky Mall Transit Center will be constructed on the southeast corner of 79 th Ave. and Thomas Rd. and the ZOOM circulator will be extended further into the City of Goodyear.	

Source: Table 1-Short-term Recommendations (entire study area), Avondale Transit Implementation Plan, June, 2015, pg. 6.

actions that lead to development of transportation improvements that complement and support elements of the Transportation Plan Update, General Plan 2030, and Avondale Transit Implementation Plan.

Ultimately, the provision of high-quality transit service in Avondale largely will depend upon funding actions and the availability of rights-of-way to accommodate the four principal functional classes, which include passenger facilities and operating vehicles: rail transit and BRT, high-quality services, Express Bus, and regular bus with circulators. An exclusive right-of-way or guideway, required for commuter rail and generally desired for LRT, BRT, and other HCT options, allows a higher level of



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service for passengers. For high-quality transit and Express Bus to compete with the speed and time-saving qualities of an exclusive operating environment afforded HCT options, these services need convenient access to the regional freeway system and supporting P&R facilities. These two classes of transit also can be significantly aided by various priority treatments afforded transit vehicles that can be instituted on arterial streets. Regular, fixed-route bus service and circulators offer the flexibility and coverage that best can support shorter, locally-oriented intracommunity and intercommunity travel demand.

This Long-Range Transit Plan focuses on transit quality results dependent upon and modified by the freeways and streets of Avondale, as “managed and operated”—not just today, but in the long term. A key element of the Long-Range Transit Plan is the functional classification system of transit services and operations to guide integration of various transit services with the City’s larger transportation network. While UPRR and the I-10 freeway rights-of-way certainly could be part of a future transit network, the focus is on the City’s street network, because most of Avondale’s future transit services within the planning horizon of this plan will use City streets.

future transit system characteristics

The current transit system provides the foundation for the future transit system, and regional actions to create an integrated transit system support this foundation. Although there is no perfect way to project successful implementation of desired improvement actions into the future, the framework for future services already has considerable definition. The following sections maintain the recommended hierarchy of transportation management and transit operations characteristics for a future transit network presented in the TransPlan Update to serve the City of Avondale. The hierarchy, alluded to above, includes:

- High-Capacity Transit (HCT)/Premium Transit Quality
- High-Quality Transit/Service Enhancements
- Express Bus
- Local/Circulator/Feeder Bus/Demand Response.

These four classes of transit service effectively describe a functional hierarchy that provides a framework for making decisions relating to future transit services, as Avondale grows and expands along with other West Valley communities. Figure 5.6 shows how this hierarchy of transit services can be structured and integrated relative to the City’s roadway network, mobility needs of City residents, and overall transit system operations.

high-capacity transit/premium transit quality

HCT and premium transit quality services include CR, LRT, and BRT. All of these transit services are considered in the class of HCT. HCT transit services are directed toward supporting longer trips at higher speeds than can be achieved with Regular and Express Bus service. Typically, the vehicles, which generally operate in exclusive facilities or guideways, offer a higher quality ride and reduce travel times significantly over bus services that must operate in mixed traffic on city streets and highways. These



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Figure 5.6 Transit Functional Classification of the Avondale Transit System

		TRANSIT FUNCTIONAL CLASSIFICATION				
		High Capacity Transit/ Premium Transit Quality	High-Quality Transit	Express	Circulator/Feeder	Local
Transit Service Type		Commuter Rail, Light Rail Transit, Bus Rapid Transit	Super Grid Bus, Modern Streetcar	Express Bus	Local Bus, Circulator Bus, Feeder Bus, Demand-Responsive	
Freeway/Street Functional Classification		Rail R/W, Freeways and Major Arterials	Major and Minor Arterials	Freeways	Major and Minor Roadways	Collectors and Local
Recommended Avondale Transportation Facilities		UPRR, I-10, Van Buren, Dysart/Van Buren/ Roosevelt/99th Ave Corridor (LRT)	Indian School, McDowell, Buckeye, Dysart, Avondale Blvd, 99th Ave	I-10	Thomas, Roosevelt, Lower Buckeye, Broadway, Litchfield, Dysart, El Mirage, Avondale, 107th	Not Applicable
Transportation Management and Operations Characteristics	Transit Priority	"Transit First" policy: extensive application of dedicated/ exclusive lanes; queue bypasses; traffic signal priority	Some intersections with traffic signal priority	"Transit First" policy: extensive application of dedicated/ exclusive/ HOV lanes on freeway itself and ramps	Any congested intersections would have traffic signal priority	None
	Pedestrian Linkages	Convenient, well designed paths should be available in all directions from each stop to adjacent neighborhoods and activities		None	Standard sidewalk connections should be available from each stop to adjacent neighborhoods and activities	
Transit Operations Characteristics	Average Route Speed (between stops)	High: equivalent or better than street traffic	Medium: generally equivalent to street traffic	High: better than freeway traffic	Low to Medium: some stretches of arterial runs equivalent to street traffic, but most stretches slower	Low: slower than street traffic
	Station/Stops	High quality design; passenger amenities available; generally no closer than one mile apart	Shelters at most stops; modest passenger amenities at high demand stops	None	Shelters at some primary stops	Bench at some stops
	Intelligent Transportation Systems Technology	Real-time bus status shown on a sign/monitor at each station/stop	Real-time bus status shown on a sign/monitor at high demand stops	N/A	None	

Source: Table 5-4. Transit Functional Classification of Avondale Transportation Network, Transportation Plan Update – Final Report, November 2012, pg. 58.



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HCT systems also are oriented to creating an integrated regional network to enhance connectivity between activity centers and communities.

HCT transit generally can be developed to operate in existing rights-of-way of transportation corridors (e.g., freeway/highway and rail) or an independent, exclusive right-of-way can be secured. CR services often are located in existing rail corridors, where available, and can operate concurrently with rail freight service. LRT and BRT services can operate in mixed traffic on city streets and highways, where a portion of the right-of-way is set aside and dedicated to transit operations. These two transit services also can be developed with exclusive guideways separated from roadway traffic. HCT services reflect a “Transit First” policy and would be developed to provide priority travel between transit centers and major station stops in Avondale. Average route speed would be relatively high, and stop spacing will range from medium (1/2 to 2 miles for BRT and LRT) to long (3 to 5 miles for CR). Recommended HCT to serve Avondale includes the following services and facilities:

Commuter Rail along the UPRR Yuma West (Wellton Branch) Line

This HCT service would take advantage of the existing railroad right-of-way of the owned by the UPRR, which is referred to as Yuma West Corridor in the MAG Commuter Rail System Study (2010). A primary location for an Avondale station would be the northwest corner of Avondale Boulevard at the UPRR/Buckeye Road alignment.

LRT in the I-10 West Corridor

This HCT service would be an extension of the I-10 West LRT Line planned to extend from Downtown Phoenix to 79th Avenue. Development of LRT service will have a drawn-out time line, but shuttle service from the Avondale Transit Center to an LRT station serving Avondale would create a strong regional linkage. Alternatively, if LRT is not extended within the life of the Avondale Transit Center, a new station and P&R could be developed at I-10 with direct service from the LRT system. Other opportunities for an Avondale LRT connection may shuttle service to a station at the Goodyear P&R, which is directly north of I-10, and a station/P&R at Gateway Crossing/Gateway Pavilions, which is two and ½ miles west of the planned 79th Avenue LRT station.

BRT Service in the I-10 West Corridor

The I-10 West RAPID service operations out of the 79th Avenue P&R is a precursor of BRT service. BRT service may be developed west of 79th Avenue once the LRT is extended to this site from Downtown Phoenix. Thus, BRT service could develop over time in combination with increased freeway Express Bus service and as a complement to the LRT service.

99th Avenue/McDowell/Roosevelt

Another possible HCT corridor has been identified that would traverse 99th Avenue/McDowell Road/Roosevelt Street. This route would serve the future City Center development and provide a possible Avondale Transit Center connection to future LRT in the I-10 West Corridor.

high-quality transit

Enhancing the quality of transit services focuses on longer trip lengths. The intent is to provide sufficiently high-quality transit service to attract to commuters in single-occupancy vehicles (SOVs),



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even multiple-occupancy vehicles, taking longer trips. These services typically have fewer stops than Express Bus service and achieve increased average speeds and decreased travel times by providing special privileges to the bus operations. For example, a queue jumper privilege allows transit vehicles to enter a special lane (usually on the right side of the roadway), then proceed ahead of traffic by responding to a dedicated signal. Signal preemption also is a privilege that allows transit vehicle operators to override a traffic signal, allowing the bus to proceed through without interruption to its progress.

Thus, the application of traffic priority measures, such as these, along with other amenities that may be associated with the service (e.g., shelters, advance ticket purchase, more comfortable seating) is designed to make longer trips more convenient, shorter (in terms of time), and more comfortable. Both buses and modern streetcars may be employed in certain corridors with these travel/movement privileges that expedite the trip for transit users. Even though the vehicles operate in accordance with posted speed limits and there are a number of bus stops along the route, high-quality transit can greatly contribute to the effectiveness of the overall transit system. Some services may actually function to support and feed HCT transit services. Super Grid services within the Phoenix region would fit within this category. Arterial streets recommended for consideration for high-quality transit services are: Indian School Road, McDowell Road, Van Buren Street, Buckeye Road, Dysart Road (Western to Indian School), Avondale Boulevard (Lower Buckeye to McDowell), and 99th Avenue.

express bus

Although Express Bus service typically is seen as a non-stop or minimum-stop, bus-on-freeway service, the collection and distribution of passengers may occur within the community at specifically designated locations. Generally, Express Buses also will serve one or more P&R facilities. These services cater to longer trip lengths and, typically, offer high quality, high speed service. In the case of Express Bus service, higher speeds and lower travel times are more important than ride quality, which is not the case with BRT service. Today, Express Bus services throughout the Valley generally are oriented to Downtown Phoenix.

local/circulator/feeder bus/demand response

This classification of transit service includes four types of bus service and, generally, accounts for the greatest amount of vehicle inventory and operators. It is as close to home as one can get relative to public transportation services and more ubiquitous in the community.

Fixed-Route, Schedule, Regular Bus

Fixed-route, scheduled, regular bus service, is based on the deployment of large vehicles accommodating 40 to 60 passengers operating throughout the region between and among communities. An effort is made to make connections between the different routes as timely as possible to permit system users to reach various destination via more than one route, if necessary.

Neighborhood Circulators

The service of neighborhood circulators is generally focused in and around a specific area (e.g., municipality) or activity center, offering shuttle-type services to/from various features associated with the area or activity center (e.g., downtown). Typically, smaller vehicles (30-35 passengers) operate as



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circulators, providing connectivity with the regular route bus service or even HCT transit; in the latter respect, it serves as a Feeder Bus (see below). This connectivity permits passengers to ride the bus to the desired destination, such as a downtown area, then use the circulator to reach the specific site within the area; the reverse process supports the return trip.

Feeder Bus

Feeder bus service is similar to circulator service in that the service is provided in a focused area and the intent is to pick up and transport passengers to a transit service supporting continued travel, such as a CR, LRT, BRT, or Express Bus station/stop or terminal. Passengers disembark the feeder bus and board the other service; the return trip is accomplished by reversing this process. Depending on the purpose of this service, vehicles may be the smaller types used for circulator service or larger buses used for fixed-route service.

Demand Response

Demand response (typically referred to as Dial-A-Ride) service generally caters to short, non-work trip purposes, intracommunity trips, and special trips (e.g., medical appointment). Although this class of service generally has specific destinations, it can serve a useful feeder function under certain circumstances and conditions. Usually, Dial-A-Ride vehicles are smaller buses capable of carrying only 12 to 15 passengers (including the driver); however, small vans also are often used for this service, depending on the area served and demand for the service.

Because this class of transit service is highly focused in purpose and operations, it is essentially developed around careful study of land use, activity centers, and how these features of the community interact with the larger transportation system. Nevertheless, there are several arterial streets that can be recommended for consideration to support local/circulator/feeder functions:

- Indian School Road (western portion),
- Thomas Road,
- Lower Buckeye Road,
- Litchfield Road (Lower Buckeye to Western),
- Dysart Road (Lower Buckeye to Western),
- El Mirage Road (south of Buckeye),
- Avondale Boulevard (from future SR-30 to Lower Buckeye to support planned Employment and Commercial Corridor, and McDowell Road to Thomas Road), and
- 107th Avenue.

Depending upon the realized land uses developed in the area of the future SR-30 freeway, there may be cause to add some street segments (in addition to the planned route along Avondale Boulevard) as “circulator/feeder” service south of Lower Buckeye Road. However, the demand for HCT or express transit along the SR-30 corridor would appear to be unlikely by 2030 (even though it was considered in earlier RTPs).



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future long-range transit plan

A plan view of the recommended Long Range Transit Plan for Avondale is shown in Figure 5.7. The Long-Range Transit Plan depicts the various transportation facilities by transit functional classification described above (refer to Figure 5.6). Significantly, the Long-Range Transit Plan places more emphasis on managing the City's transportation facilities in order to eventually provide high-quality transit service to City residents. Given the 25-year outlook, specific routings are not as critical as preserving and providing the opportunity for future high-quality transit service. Implementation of this Plan in concert with the Avondale Transit Implementation Plan, based on considered policy and programming actions, will permit the City to develop over time high-quality transit services, as demand warrants and in accordance with growth and development of Avondale and the West Valley. Activating this Plan also should be coordinated with any findings developed with completion of the Southwest Valley Local Transit System Study being administered by MAG and the MAG RTP.

terminal/stop facilities

Terminal/Stop facilities include transit centers, P&R facilities, stations, and bus stops (with and without amenities, such as shelters). Transit centers are more like "hubs" where multiple routes come together, permitting transit users to transfer between routes to reach their desired destination. Parking spaces to accommodate P&R patrons normally are provided at these centers. Although not very often, there can be stand-alone, P&R facilities that serve a single route or two, and do not function as a hub. Today's centers and many stations, even some stops, also include storage for bicycles for those desiring to bicycle to the bus or rail transit service, but not take their bicycle on board the vehicle. Bicycles are accommodated with spaces, lockers, and racks, depending on the facility.

The proposed Long-Range Transit Plan includes three major transit points for HCT service within, or adjacent to, the City of Avondale:

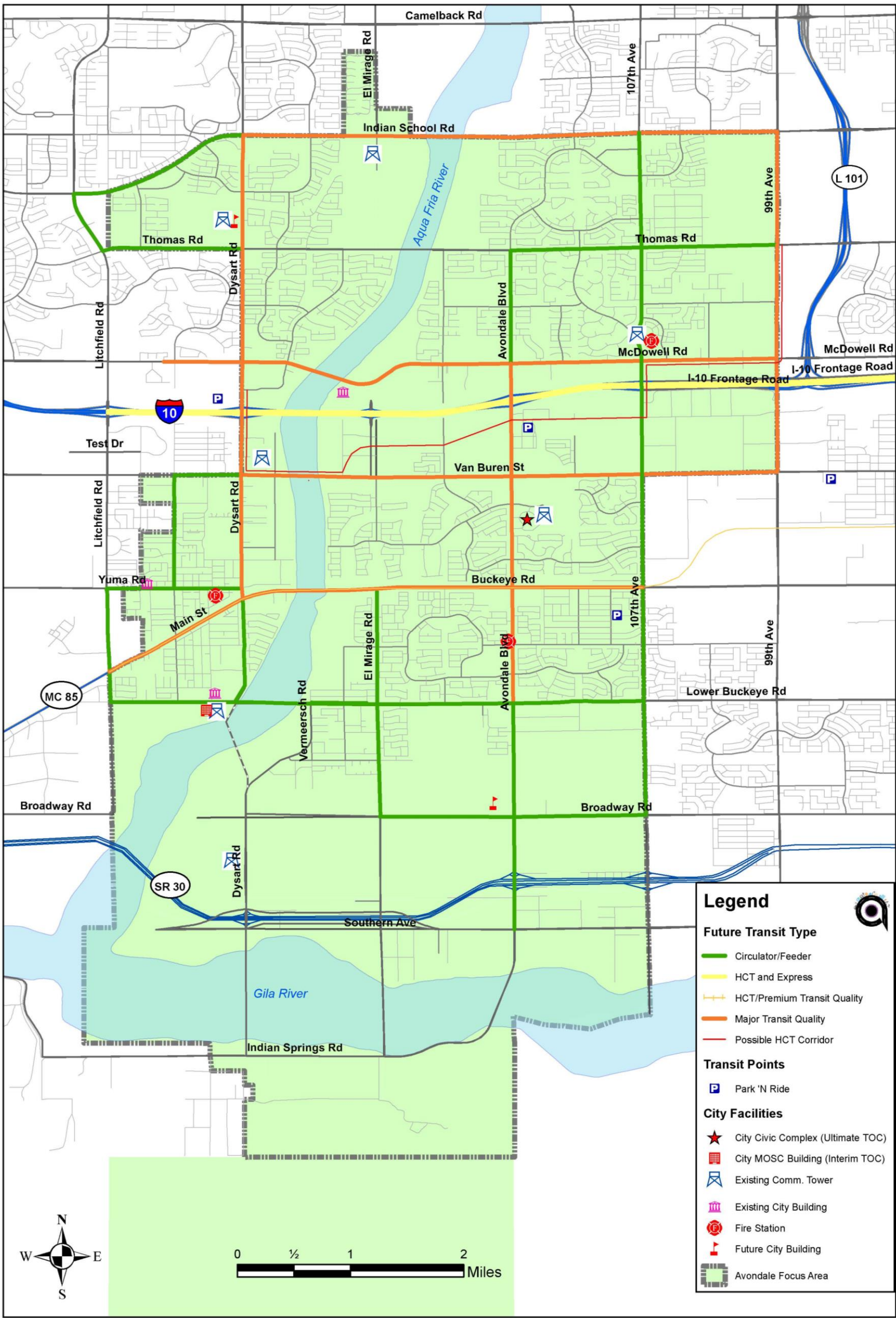
- Two HCT stations would be relied on by the City—the existing transit center (P&R facility) in Goodyear just west of the Dysart Road/McDowell Road intersection, and a prospective P&R facility near 99th Avenue and Thomas Road (as the interim terminus of the HCT I-10 west corridor). Both of these locations would be accessible via proposed High-Quality Transit service within the City.
- A third HCT station in the northeast corner of the Avondale Boulevard/Buckeye Road intersection would serve the future CR line using the UPRR right-of-way. This station would require bus transfer/loading zones and P&R facilities. Two adjoining CR stations are proposed: one to the east in Tolleson at 91st Avenue and the other to the west in the vicinity of the Goodyear Airport.



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Figure 5.7 Long-Range Transit Plan for Avondale



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.





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6. bike plan

Bikeways and pedestrian facilities accommodate non-motorized modes of transportation within the City, and the option to choose those modes. The proposed Bike Plan for the City of Avondale is consistent with the goals and objectives set forth in the Bicycling Element of the City's General Plan 2030 and furthers the prospect of providing a network that accommodates multi-modal travel. The proposed plan guides the effort to create a system of bikeways that can attract users through lesser travel operating costs, healthier living, and environmental consciousness. While immediate needs may determine near-term improvements, the Plan assumes and the system relies on a comprehensive network of bicycle and pedestrian provisions coupled with amenities/attractions like parks, schools, community centers, commercial areas, employment centers, and transit routes.

existing bikeways

A bikeway (bike lane) is defined in the City's General Engineering Requirements Manual as: "an integral section of a roadway that is marked for exclusive bicycle use...Located on each side of the roadway bike lanes are always one-way in the direction of the traffic flow." Additionally, bikeways may be comprised of "shared streets, bike lanes, or multiuse paths in any combination," and designated by signing or by placement on a map. The previously presented Figure 4.2 showed the current bicycle provisions within the City, which included bike lanes and paved shoulders. There are currently about 127.3 miles of directional bikeways within the City—an increase of about 71% since the last transportation plan update. Additionally, there are 34.4 miles of multi-use paths and river trails through Avondale.

bikeway improvement projects

Generally, the expansion of bikeways will rely on being a part of other roadway widening/improvement and pavement preservation projects. Providing multimodal accommodations along with the roadway construction permits multimodal choices and contributes to the overall implementation of the bikeway system. There are several planned improvement projects which would implement sections of bikeways as part of roadway improvement projects, resulting in 52.6 added lane-miles. Figure 6.1 shows the net gain in bikeways facilities as a part of these projects. In addition, the City recently updated its pavement preservation program.

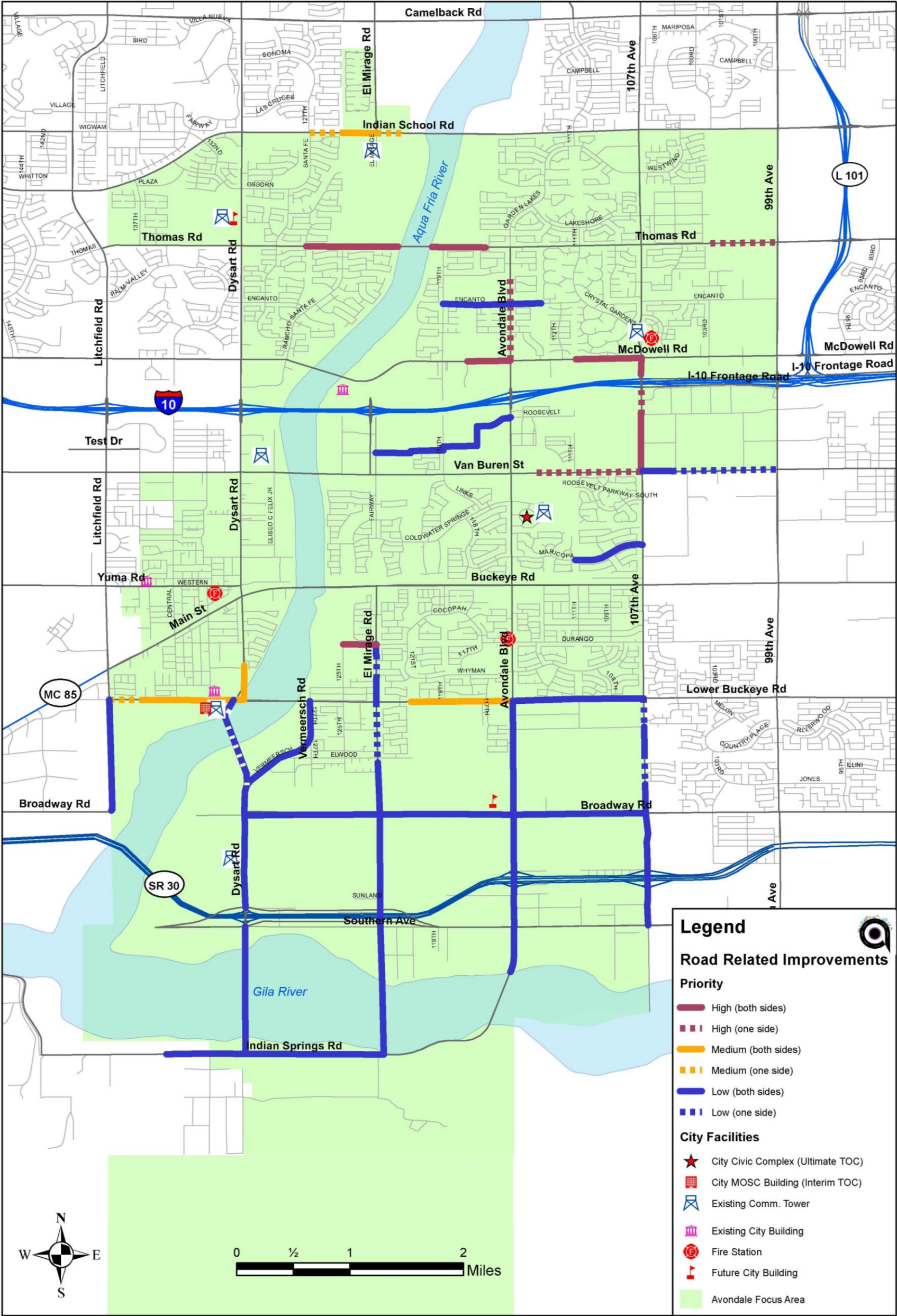
In addition to incorporation of bicycle amenities on new roadway improvements, there are 23.6 lane-miles of recommended bikeway improvements including 0.8 miles of new multi-use trail segments. To prioritize the needs for implementing a complete bikeway system within the City, a scoring methodology was followed to rank certain segments of the incomplete system. The score, which tops out at 16, has four components contributing a maximum of four points each (partial points possible):



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Figure 6.1 Bicycle Network Expansion from Roadway Projects





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connection type

- 1—Segment provides limited connectivity; its implementation is generally only for the overall good of the complete system.
- 2—Segment would link other bikeways within a neighborhood sub-system (or transit element)
- 3—Segment represents a minor gap that would effectively complete a larger sub- system or network of bikeways.
- 4—Segment provides a critical linkage between networks of bikeways.

implementation effort

- 1—Little to no provisions in place to implement bikeways.
- 2—Some provision already in place—e.g., edge striping.
- 3—Partial improvements, including incomplete bikeways are present.
- 4—Only minor additions/improvements needed to provide bikeways.

associated projects

- 1—Requires future bikeway only project.
- 2—Part of a current bikeway only/related project.
- 3—Requires future inclusion with a larger roadway improvement project.
- 4—Part of a current/planned roadway improvement project.

associated area

- 1—No particular associations (i.e., the segment is needed for overall system completion).
- 2—Near to a planned infill development district or other equally active area.
- 3—Near a recreational amenity.
- 4—Near a community facility.

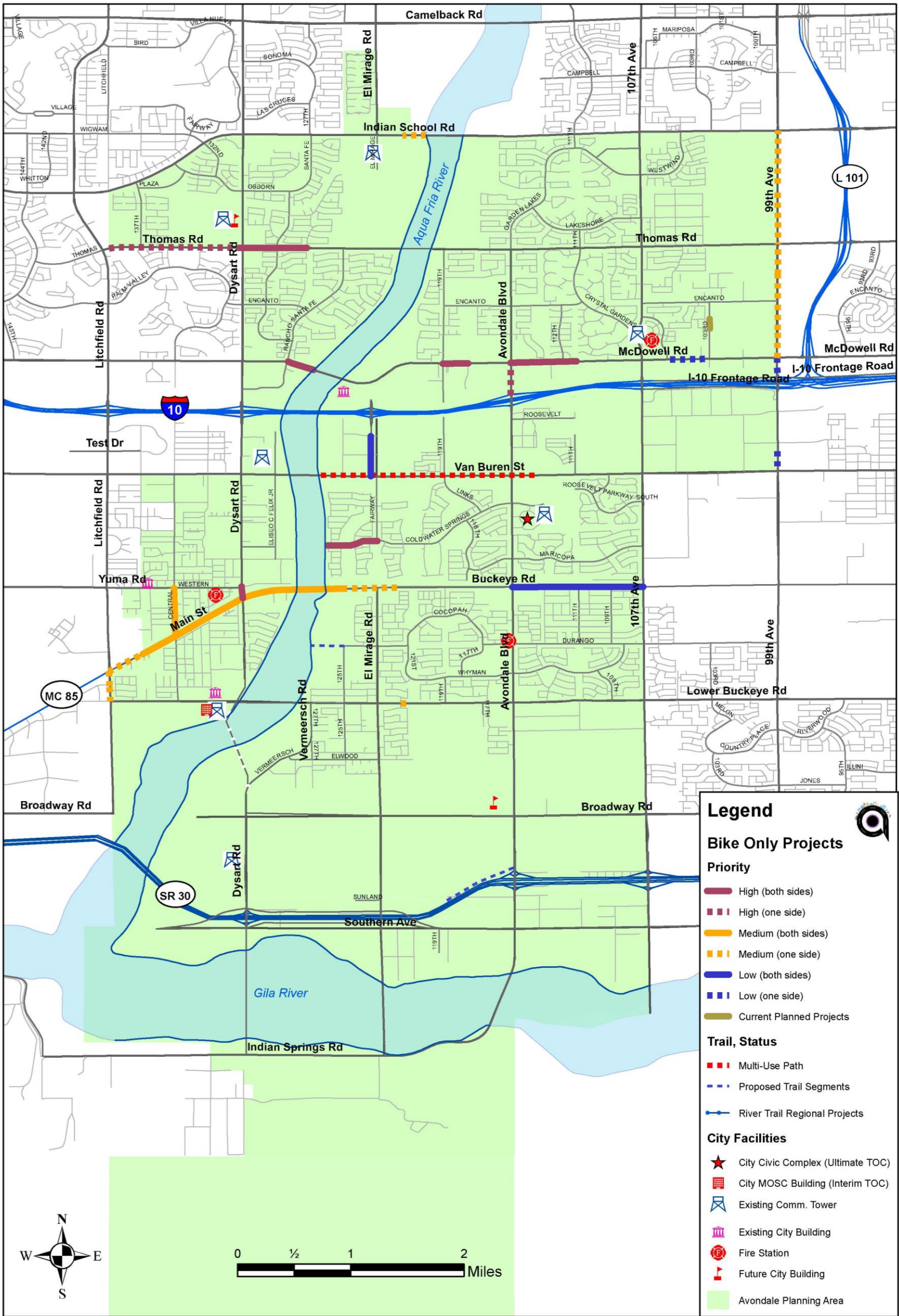
Based on this scoring methodology, provisions already existing, and the development plan incorporated in the General Plan 2030, the potential developable segments were scored. Recommended segments for improvement are presented in Figure 6.2. Additional consideration was given to areas near transit service/stops and locations/segments with bicycle-related crash history. The top segments scored 12.5 out of 16 and both involved 107th Avenue, providing connections of already established sub-networks of bike lanes. Segments scoring 10 or more points were considered “high priority,” which would equate with implementing within the next five years. The next range of scores (7 up to 10) were considered “medium priority,” with an expected outlook of no more than 10 years. Low priority projects may take as long as 15 years to complete, although could be implemented sooner, if opportune roadway improvement projects should occur (either at the City’s discretion or as part of land development



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Figure 6.2 Recommended Bicycle-Only Projects





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The City's Standard Details pertaining to roadway cross-sections all include a provision for bike lanes in each direction on roadways other than local streets. On-street bike lanes will be provided as part of all new roadway improvement projects.

bike plan recommendations

The following recommendations are proposed to enhance the utilization of bicycling as a travel mode within the City:

- Require all newly constructed and improved roadways on arterial- and collector-class facilities and all pavement preservation projects to conform to standard cross-sections, which include bike lane provisions.
- Provide bi-directional improvements where current facilities on arterial roadways exist on only one side.
- Provide a bikeways improvement on the Durango Street alignment from 125th Avenue to Agua Fria Trail. Also, divert the existing Durango Channel Trail west and south along the SR-30 Right of Way. These trail improvements were not scored along with the roadway bicycle improvements but were given low priority due to expected development schedules.
- Work with developers to provide bicycle-friendly amenities and connections and/or integrate similar aspects into City projects, as appropriate.
- Review public buildings for bicycle-friendly amenities—work with City facilities, parks, and police divisions.
- Strive to achieve a Bike Friendly Community rating through the League of American Bicyclists.
- Coordinate efforts and potential projects with information presented in the recently adopted “Parks, Recreation and Trails Master Plan” and with an ultimate goal of a bikeway network that connects to the City's system of parks.
- Implement a roadway re-striping program to include provisions for bike lanes when and where feasible.
- Coordinate with adjacent jurisdictions to achieve continuity of bike lanes across jurisdictional boundaries.



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7. advanced traffic management system

An Advanced Traffic Management System (ATMS) results from the marriage of a roadway system and implemented Intelligent Transportation Systems (ITS), which includes a variety of technology, such as traffic detectors, monitoring cameras, and communication systems to permit traffic monitoring, optimized traffic signal timing, control over traffic flow, and increased maintenance efficiency by receiving real-time information from the field. The City has already developed an ITS Strategic Plan (July 2010), which previously was summarized in the 2012 Transportation Plan Update and is depicted in this chapter.

purpose of the ITS strategic plan

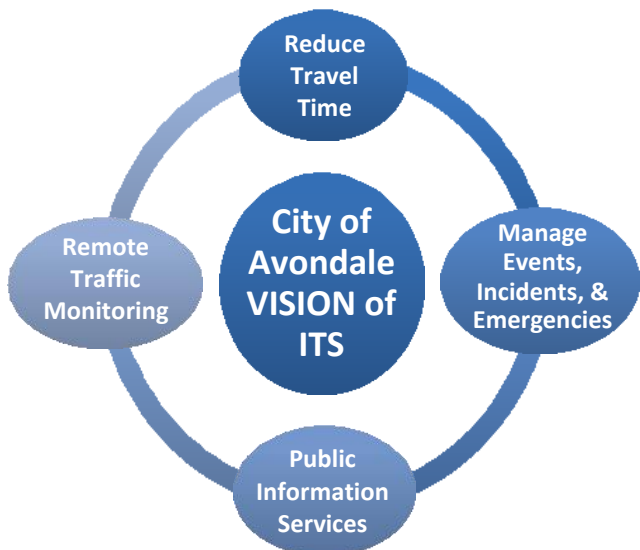
The Avondale ITS Strategic Plan is a document that presents the existing state of the City's ITS infrastructure and defines interim, as well as long-term, ITS needs. It is a tool for implementing a system of transportation strategies based on a set of known opportunities. In addition, the plan's purpose is to establish the need for ITS investments in the City, to identify priorities to direct ITS investment, and to identify specific projects to be deployed to address needs. These needs are discussed and explained in terms of a regional ITS context.

the city's vision of ITS

ITS incorporates information and communications technology with transportation infrastructure elements to manage vehicles, loads, and routes to improve safety and reduce vehicle wear, transportation delay, and fuel consumption. Real-time information is used to assimilate and manage the components of a conventional transportation system.

ITS allows the City the flexibility to:

- Alert motorists and transit operators of congestion; improve safety
- Provide real-time transit arrival and departure information to passengers
- Detect and respond to traffic incidents
- Reduce corridor congestion, environmental pollutants, and fuel consumption
- Participate in Regional ITS efforts for reducing response time to, and recovery from, incidents along Interstate 10.





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inventory

In order to formulate a plan for implementing future ITS elements within the City, an accounting of its current inventory of intelligent transportation related infrastructure that is operated and maintained is required. The various infrastructure items are discussed below, as they apply to the City of Avondale.

traffic signal system

There are a total of 68 traffic signals operating within or at the border of the city limits. The City controls 46 of these traffic signals, while the rest are operated by other jurisdictions. ADOT controls six (6) traffic signals at three of the four interchanges along I-10 within Avondale. MCDOT operates ten (10) traffic signals: five (5) along Indian School Road and five (5) along Buckeye Road (MC-85). The traffic signal at 99th Avenue and Thomas Road is operated by the City of Phoenix; the City of Tolleson has jurisdictional control over three (3) signals along 99th Avenue south of I-10; and the City of Goodyear operates two (2) traffic signals: one (1) at Litchfield Road and Buckeye Road (MC-85) and another at Litchfield Road and Thomas Road.

Although the City has existing conduit in place along some roadway segments, there is a limited physical communication medium (fiber optic or otherwise) in place at this time, exceptions include Avondale Boulevard between McDowell Road and the City Civic Center, Dysart Road between Van Buren Street and Osborn Road, and McDowell Road between Avondale Boulevard and 99th Avenue. Therefore, communication to/from the majority of traffic signal systems is facilitated by wireless communications via line-of-sight between adjacent signalized intersections and between City buildings and water distribution sites throughout the City. Figure 7.1 shows the existing ITS infrastructure including traffic signal interconnect conduit, wireless communication, and Closed Circuit Television (CCTV) locations in the study area.

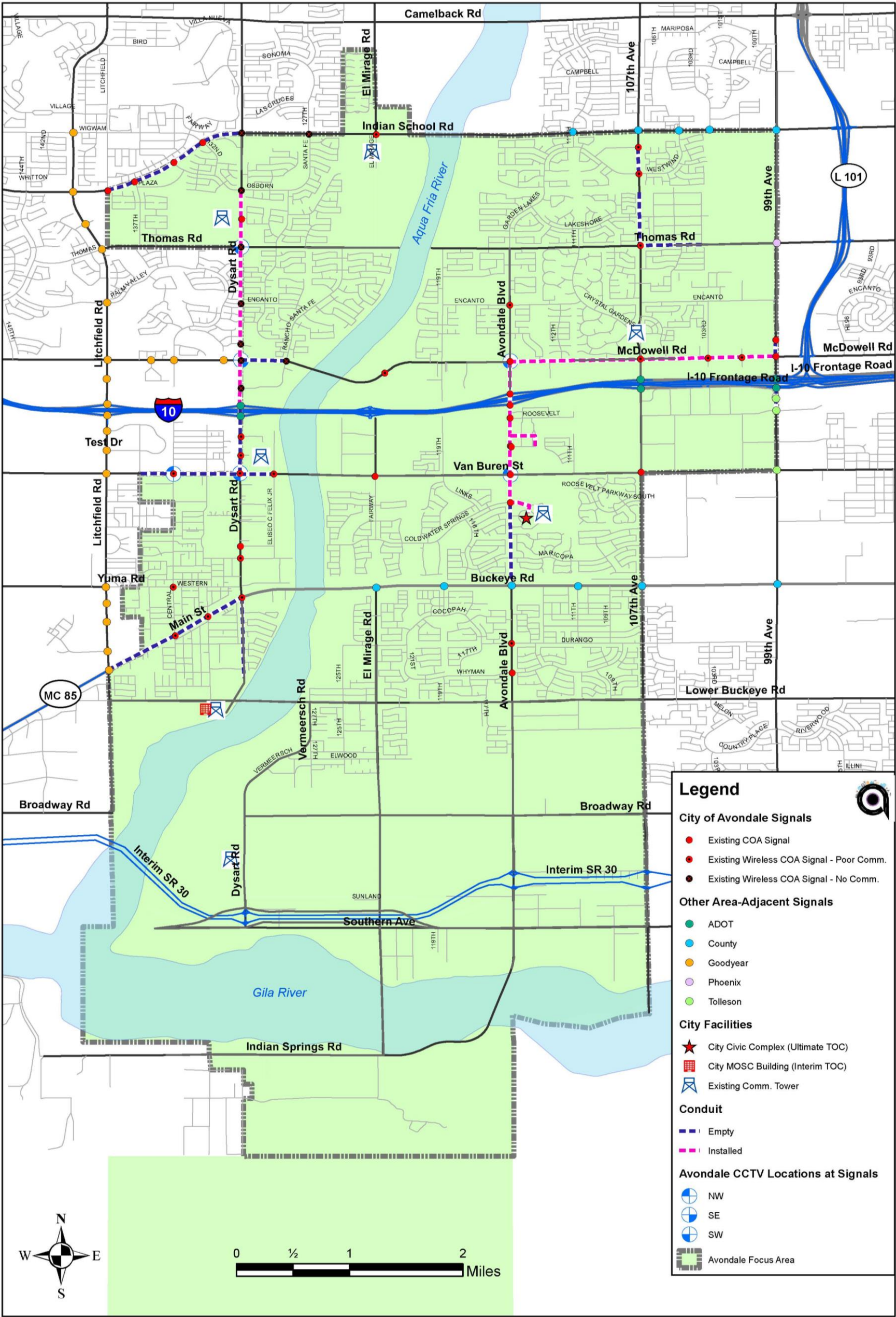
The creation of a formal TOC at the Civic Center campus allows for the efficient gathering and dissemination of information, so that City staff can effectively assess and respond to the needs and conditions of the City's transportation system. New, upgraded controllers and software are being purchased to enhance the operations of the TOC. The larger physical area of the TOC allows for multiple personnel to view (via wall-mounted video display), discuss, and respond to traffic conditions (e.g., construction zones) or incidents that may be occurring. The technology of the TOC also makes administering special traffic signal timing (as directed by a signal technician or police officer) and/or collecting traffic volume data routine tasks. The TOC also serves as a gateway for enabling regional communication, collaboration, and operational connectivity.



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Figure 7.1 Existing ITS Infrastructure





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traffic signal controllers and coordination

The City of Avondale primarily uses Naztec 2070 “LITE” controllers and Type 332 cabinets at its signalized intersections. Naztec’s ATMS now is the name of software used to run and interface with the controllers. Several intersections controlled by the City do not communicate with a central system. These intersections run time of day plans and are unable to send an alarm if they are not working properly. The City uses Cisco equipment for its wireless communication. It is unlicensed, and there have been over 59 reported competing frequencies. Avondale has an integrated communication system which makes it more difficult to give other agencies permission to access its transportation devices.

Approximately one half of Avondale’s intersections use video detection. The remaining intersections have a mixture of loop detection and no detection.

communications

Over the years, the City has implemented some sections of underground conduit for future communications use. As depicted previously in Figure 7.1, the locations, extents, and conduit sizes vary. Current communication with the City’s traffic signals is facilitated by a network of City buildings/water distribution sites and wireless radios installed at 29 of the City’s 46 signals. However, all of the wireless traffic signals have communication conflicts rendering them isolated from the system. Further, overall degradation of the system over the years has rendered it useless and in need of replacement/upgrade.

Regionally, as part of the Arizona Department of Transportation Regional Community Network (RCN), a fiber communication network between MAG member agencies is being implemented to allow traffic operation centers and public safety agencies to better communicate and respond more efficiently to transportation related issues. At this time ADOT is proposing to extend the communications network to the west valley, including Avondale, with the FY2015 TIP as part of the FMS extension project.

emergency vehicle preemption

Most of the City traffic signals employ preemption sensors that permit cycling of the signal phasing to provide green lights corresponding with the approaching emergency vehicle. The City will be implementing the use of the 2097 Detector and LED Confirmation Light assembly for new installations of the emergency pre-emption equipment. Additionally, the controller cards within the signal cabinets are accessible by laptop computer to assist with efficient trouble-shooting of bad detectors and chips.

CCTV cameras

Five of the City’s 46 traffic signals have closed-circuit television (CCTV) cameras installed for remote viewing by City technicians and safety/emergency services personnel (although overall communications degradation is negatively affecting access/use). The CCTVs are located at major intersections where traffic congestion and the potential for incidents is the greatest. The cameras are able to pan, tilt, and zoom to show traffic conditions, near-by incidents, or traffic signal indications. The



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cameras run over Internet Protocol (IP) and do not rely on the Camera Cameleon™ software utilized by most agencies in the Valley (e.g., ADOT), and in general need to be upgraded as most are six or more years old. Some cameras are associated with traffic signals that do not have adequate communication to the central system (refer to Figure 7.1).

dynamic message signs

The City owns four portable Dynamic Message Signs (DMS), which are used for traffic control relating to work zones, special events, and other applicable needs. The usefulness of these signs could be enhanced by adding remote access capability and an integrated CCTV camera.

DMS elements provide a number of benefits to the motoring public. DMS allow display of real-time information to help motorists to make informed travel route choices. Appropriate messages at critical roadway points offer drivers alternative paths to their destination helping to reduce overall travel time and roadway congestion while improving air quality and saving fuel. Safety is improved by warning motorists of approaching incidents to avoid sudden lane changes and awareness to reduce secondary collisions. Advance warnings relating to upcoming road work or special events allow motorists time to pre-plan upcoming activities well in advance of condition changes. Messages could also be provided for special events such as parking conditions, lane control features, speed limit reductions, and providing special information dissemination as needed such as Amber Alerts.

Connection to the regional backbone would allow information to be shared between municipalities well in advance of an incident on regional facilities from a single office location or messages could be posted along the travel corridor to better inform motorists of conditions. There also would be the potential for placing DMS on arterial roadways or other City streets controlled specifically by the City to facilitate messaging aimed more specifically to local residents. Some specific examples of continuing or enhancing DMS that may benefit City residents directly include: informing motorists of appropriate travel times to the Phoenix area using alternative routes, such as I-10, MC-85, and/or the future SR-30; posting travel times, based on different travel modes or lane designations; notifying motorists of upcoming special events within the City; and helping direct traffic to parking areas for special events at Phoenix International Raceway (PIR), City Center, or other major event locations to avoid congestion along City streets.

ITS-related issues

The following are some of the transportation-related issues the City currently is facing, which would be resolved through effective ITS deployment.

traffic signal coordination

Most of Avondale's traffic signals along its corridors are coordinated. Traffic signal controllers not connected to the central system experience time drift which can cause inefficient or improper coordination. Likewise, a breakdown in communication can also affect coordination. Lack of signal coordination results in undue delays and increased travel times, as well as hinders seamless traffic



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operations. With the City currently utilizing wireless communications to most of its traffic signals, reliability is an issue and a concern, because the communications utilize line-of-sight, which can be hindered by new developments, landscape growth, and congested communication bandwidth.

traveler information dissemination

The City currently does not have the means to broadcast or distribute traffic-related information in a real-time context. Permanent dynamic message signs along with enhanced website-based information would be two ITS elements that could help bridge this information dissemination gap. Utilizing the regional 511 telephone system and “www.az511.com” website would improve traveler information dissemination in the City.

event traffic management

PIR is located within the City’s planning area (south of Gila River), so event-related traffic is a periodic concern. Routes to and from PIR typically consist of City roadways. Even though traffic currently is managed by the PIR event staff, with County oversight, that responsibility could easily transfer to the City in future years. The Regional Emergency Action Coordinating Team (REACT) of Maricopa County reroutes and detours event traffic using portable signs, barricades, and cones. Major event intersections are directed by police. ADOT-operated DMS provide route information to drivers. Other events could include closures, restrictions, or incidents involving I-10, which divides the City; incidents on I-10 have the potential to divert large volumes of traffic onto parallel roadways traversing the City.

limited resources

As is seemingly the case with all municipalities, especially of late, scarcity of funding sources magnifies the significance of arriving at cost-effective decisions regarding implementation of capital improvements. This is particularly troubling for the City of Avondale, as its existing infrastructure basis is isolated and limited. However, use of City staff for planning, designing, installing, and maintaining ITS elements can prove to be very cost-effective (or time-saving) and beneficial to improving staff efficiencies, retention, and training.

assessment of ITS needs

identification

Given the City’s emerging ITS infrastructure, many of the possible ITS elements are available for consideration within the City over the next 20 years. The City’s ITS needs were identified based on meetings conducted during the development of the ITS Strategic Plan that involved City of Avondale staff, representatives from other agencies and the desired goals.

prioritization of needs

Although the identified ITS needs may be desirable to have immediately, funding, base infrastructure needs, and interim remedies, will dictate their implementation priority. Re- establishing



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communication with certain traffic signals and enhancing the amount of data that can be exchanged are immediate priorities for the City. Within the interim phase of implementing a complete ITS Strategic Plan, there are communication-specific priorities (see Figures 7.2 and 7.3 on the following pages). The remaining ITS needs are prioritized within the Long-Term phase of the plan (see Tables 7.1 and 7.2 below). As needed, the City may exercise discretion in adhering to the prioritized projects as unforeseen project/funding opportunities arise in the course of other events.

Table 7.1 Long-Term Medium Priority Needs

Description	
Expanded video surveillance	Use of driver feedback signs
Data collection stations & data extraction / storage	Incident management system (enhanced)
Dynamic message signs (permanent)	Interagency incident management
Automatic incident detection (enhanced)	AVL equipment for emergency vehicles
Interagency data sharing / coordination (enhanced)	Dynamic route mapping for emergency dispatch center

Table 7.2 Long-Term Low Priority Needs

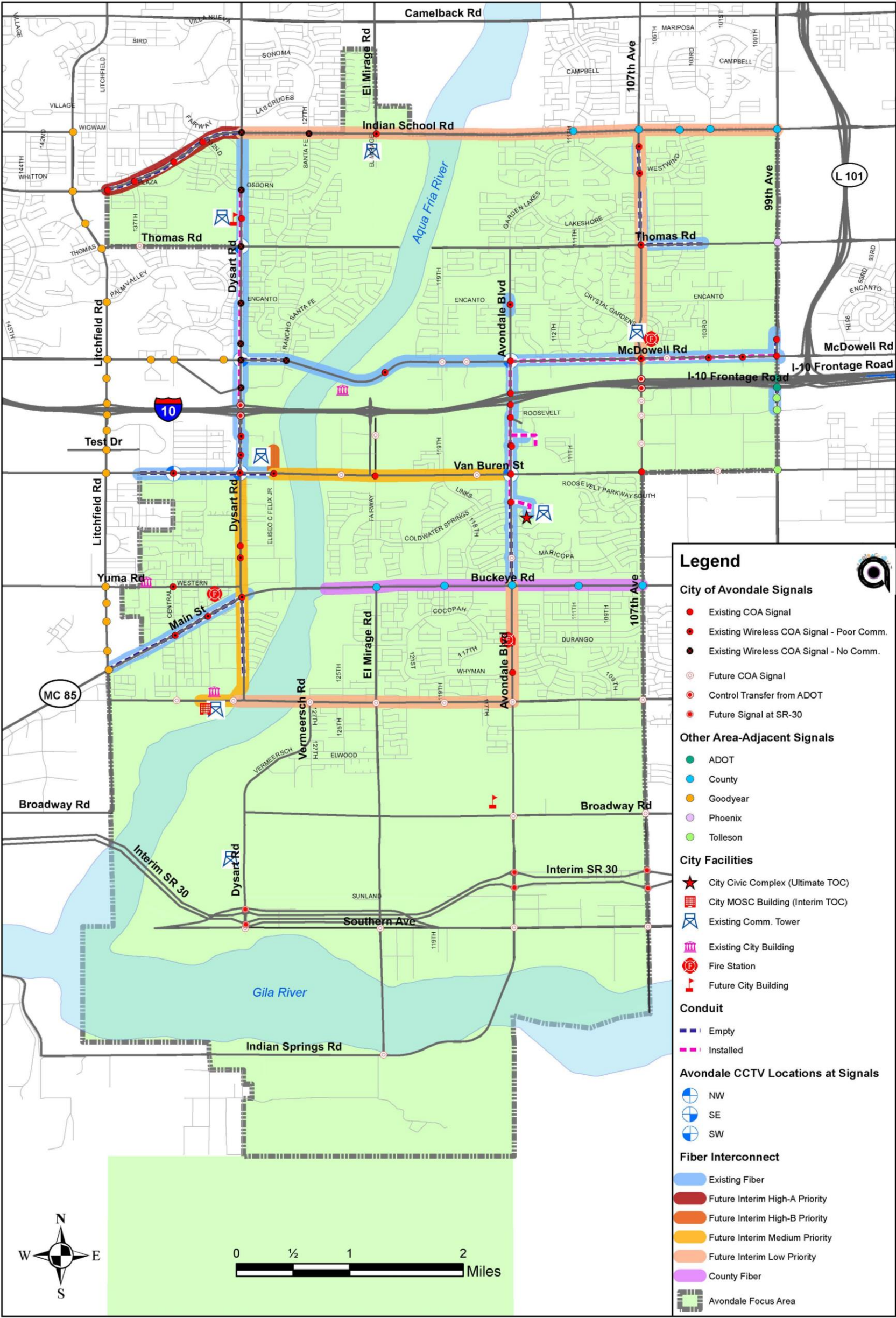
Description	
Enhanced traffic control capabilities	Use of CCTV for remote monitoring (enhanced)
Use of probe vehicles for data gathering	Mobile access to incident management data (enhanced)
Dynamic detour routing	Flood detection (enhanced)
Real-time construction information	Work zone traffic management
Web-based traveler information (enhanced)	AVL equipment for maintenance vehicles
Transit signal priority / real-time arrival / departure information	



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Figure 7.2 Interim Phase ITS Priorities





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Figure 7.3 Long-Term Priority Communication Links



Note: Dashed Lines Indicate alternative roadway alignments subject to future studies.





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funding sources

The City will not be able to bear the capital and design costs associated with the ITS projects to be implemented. Since many ITS projects can effect reduction in emissions or improve safety, Federal funding is available upon request and approval of the particular project. Also, since ITS can benefit other City divisions (e.g., police, emergency services, and information technology), there is a real opportunity to share funding burdens. Cost-sharing makes ITS projects a more cost-effective improvement endeavor. Table 7.3 provides further information about potential funding sources that may be available to the City for implementing its Intelligent Transportation System.

implementation plan

Based on the assessed ITS needs and priorities coupled with the existing state of infrastructure, an implementation schedule was developed. Table 7.4 shows the prospective projects, their approximate schedules, and anticipated costs. Figure 7.4 then shows the ultimate ITS communication structure envisioned for the City of Avondale.

It is noted that the most recent rendition of the regional ITS Strategic Plan is near completion. The Avondale ITS Strategic Plan should be revisited to align with the regional goals to be set forward as Avondale plays a vital role in the communications and safety of the I-10 corridor and other existing and future regional facilities.



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Table 7.3 Revenue Sources for ITS

Revenue Sources	Description
Congestion Mitigation & Air Quality Program (CMAQ), FHWA	Flexible CMAQ funds may be used for various types of projects to improve air quality. The FHWA encourages the use of such funds specifically to evaluate the cost-effectiveness and benefits to public health associated with projects aimed at reducing particulate matter (PM) in non-attainment and maintenance areas, as defined under the Clean Air Act. ITS projects directed toward reducing congestion are among eligible actions relating to the reduction of PM. Funding requests require project-specific information pertaining to expected change in travel speed, daily traffic volumes, and project length/area.
Highway User Revenue Fund (HURF), State of Arizona	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 the public highways. Revenue collections include: gasoline and use fuel taxes, motor carrier fees, vehicle license tax, motor vehicle registration fees, and other miscellaneous fees. Revenues are deposited into the HURF, then distributed to the State Highway Fund, cities with population over 300,000, towns, and counties. Funds in the State Highway Fund are further distributed to the Maricopa Association of Governments-MAG (12.6%) and Pima Association of Governments-PAG (2.6%) with the remainder devoted to the State Highway System (SHS). The City of Avondale can request HURF funding through application to MAG, which translates all requests into the regional TIP. Avondale received \$4,916,825.89 from HURF in
Vehicle License Tax (VLT) [approximately 55% of monies not deposited in the HURF]	Owners of vehicles that are registered for operation on the highways of Arizona pay the VLT. It is an ad valorem tax based on the assessed value of the vehicle. Approximately 45 percent of revenues collected from the VLT is distributed to the HURF, cities, towns, and counties share in the remainder. (49.5%). Avondale received in \$3,112,623.22 from the VLT in FY 2016.
Local Transportation Assistance Fund (LTAF)	The LTAF was funded from state lottery proceeds, but this source was eliminated by the State Legislature in 2010. In its last year, the LTAF generated \$32.2 million statewide and \$22 million was allocated to local jurisdictions. It was used mostly to support transit service, because the Arizona Constitution prohibits HURF from being used to support public transportation programs. The LTAF was repealed by the State Legislature, but a court order required continuation in Maricopa County, due to Federal air quality conformance commitments incorporated in the State Transportation Improvement Program (STIP). Funds for public transportation are now capped in Maricopa County at \$18 million annually, and Valley Metro reports receipt of \$16.2 million per year beginning in 2011.
Local Transportation Excise Tax	Cities can adopt additional transportation excise taxes ranging between 0.2% and 0.5%. The City of Avondale does not have a transportation excise tax in place. However, in November, 2004, Maricopa County voters approved Proposition 400, which extended a 1/2-cent sales tax to December 31, 2025. Revenue from this tax are deposited in the Regional Area Road Fund (RARF), which is administered by the Arizona Department of Transportation (ADOT). Proposition 400 revenues are distributed between the road and street system (66.7%) and public transportation (33.3%). Public transportation funds are available for capital costs, maintenance and operation of public transportation classifications along with capital costs and utility relocation costs associated with a light-rail public-transit system. There is no formula for distributing funds, but submitted projects by Maricopa County jurisdictions are evaluated, ranked, rated, prioritized, and incorporated in the Regional Transportation Plan (RTP) by committees representing the various jurisdictions.
Private Funds	These funds are provided by private land developers usually expended as part of a land development project.



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Table 7.4 ITS Project Implementation Schedule & Cost Estimates

Project Types		#	Project Type	ITS Need I.D.	Priority	Project Description	Capital Cost Estimate	Operations & Maint. Cost Estimate / Year	Implementation Year																			
									1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TM-C	Traffic Mgmt - Comms	1	TM-C	1 & 2	IHP-A	Introduce fiber optic communications primarily along Dysart Rd from Indian School Rd to Rancho Santa Fe Blvd + spur extensions along McDowell and Indian School Road (west).	\$ 342,998	\$ 1,481																				
TM-TOM	Traffic Mgmt - Traffic O&M																											
TM-TI	Traffic Mgmt - Traveler Info																											
EM	Emergency Management																											
IM	Information Management																											
Priorities		2	TM-C	1 & 2	IHP-B	Establish a hard-line fiber optic connection between Project #1 and Dysart Road signals between I-10 and Van Buren Street and the City's communication tower on Eliseo C. Felix Jr. Way + spur extension of fiber optic along Van Buren St west to Central Ave	\$ 82,040	\$ 664																				
IHP-A	Interim High Priority-A																											
IHP-B	Interim High Priority-B																											
IMP	Interim Medium Priority																											
ILP	Interim Low Priority																											
LTHP	Long Term High Priority	4	TM-C	1 & 2	ILP	Install fiber optic lines within existing conduit in various locations throughout the City. If installation is in isolated portion of the overall network, then wireless communication equipment to be installed at "gateway" point.	\$ 148,649	\$ 1,323																				
LTMP	Long Term Medium Priority																											
LTLP	Long Term Low Priority																											
		5	TM-C	n/a	Planned	Introduce fiber optic communications primarily along McDowell Road from Avondale Blvd to 99th Ave.	\$ 294,863	\$ 850																				
		6	TM-C	1 & 2	LTHP	Based on the guidance from Figure 3-4, implement fiber optic communications with the planned traffic signals along 107th Ave south of I-10. (wireless communication will be needed in interim)	\$ 191,700	\$ 400																				
		7	TM-C	2	LTHP	Establish fiber optic communications along Van Buren Street from the Project #2 terminus east to planned/implemented fiber communications along Avondale Blvd	\$ 349,218	\$ 1,050																				
		8	TM-C	1 & 2	LTHP	Extend fiber optic communications farther south on Avondale Blvd from the Project#4 terminus at MC-85 to Lower Buckeye Rd	\$ 187,700	\$ 400																				
		9	TM-C	2	LTHP	Implement fiber optic communications along Lower Buckeye Rd to establish connection between Interim TOC and Avondale Blvd (at terminus to Project #8). If traffic signals planned along Lower Buckeye occur before this project, then wireless communication equipment will be needed.	\$ 414,733	\$ 1,233																				
		10	TM-C	2	LTMP	As opportunities in funding, development associations, and other agency activity presents itself, introduce sections of the overall communication ring structure per Figure 4-1.	Fiber installation: ~\$190k / mi in new ~\$30k / mi in ex. conduit O&M: \$400/mi/yr																					
		11	TM-TO	3	LTMP	Introduce CCTV cameras to new traffic signal locations based on factors such as traffic demand, crash history, critical location.	\$10,000 / location	\$ 1,000																				
		12	TM-TI	10	LTMP	Dynamic message sign installations should be placed at key locations for controlling event-related traffic or in conjunction with available alternate routes in proximity to heavily congested areas.	\$50,000 / location	\$ 6,000																				
		13	TM-TO	8 & 23	LTMP	Introduce permanent data collection stations at locations throughout the City based on past and future data concerning traffic demand, crash locations, route decision points, etc. Must be part of established communication network so collected data can be reviewed/archived.	\$10,000 / location	\$ 1,000																				
		14	EM	18	LTMP	Equipment at traffic signals or via data collection stations (Project #13) to be used to interpret possible incident occurrences.	\$50,000 / query system	\$ 5,000																				
		15	IM	22	LTMP	Participate in interagency sharing of traffic signal related parameters and other traffic/ITS data being collected via other devices. Coordinate with establishment of the RCN and City's ultimate TOC.	\$ 50,000	\$ 15,000																				
		16+	various	remaining	LTMP/LP	Remaining ITS needs (per report listings) to be addressed in various projects implemented throughout the remainder of the 20-year plan, based on future determination of needs and funding sources.	\$ -	\$ -																				

NOTE: Cost information for establishing an Interim Traffic Operations Center (TOC) and its estimated annual cost of operations are not shown above, but are presented in the Appendix.

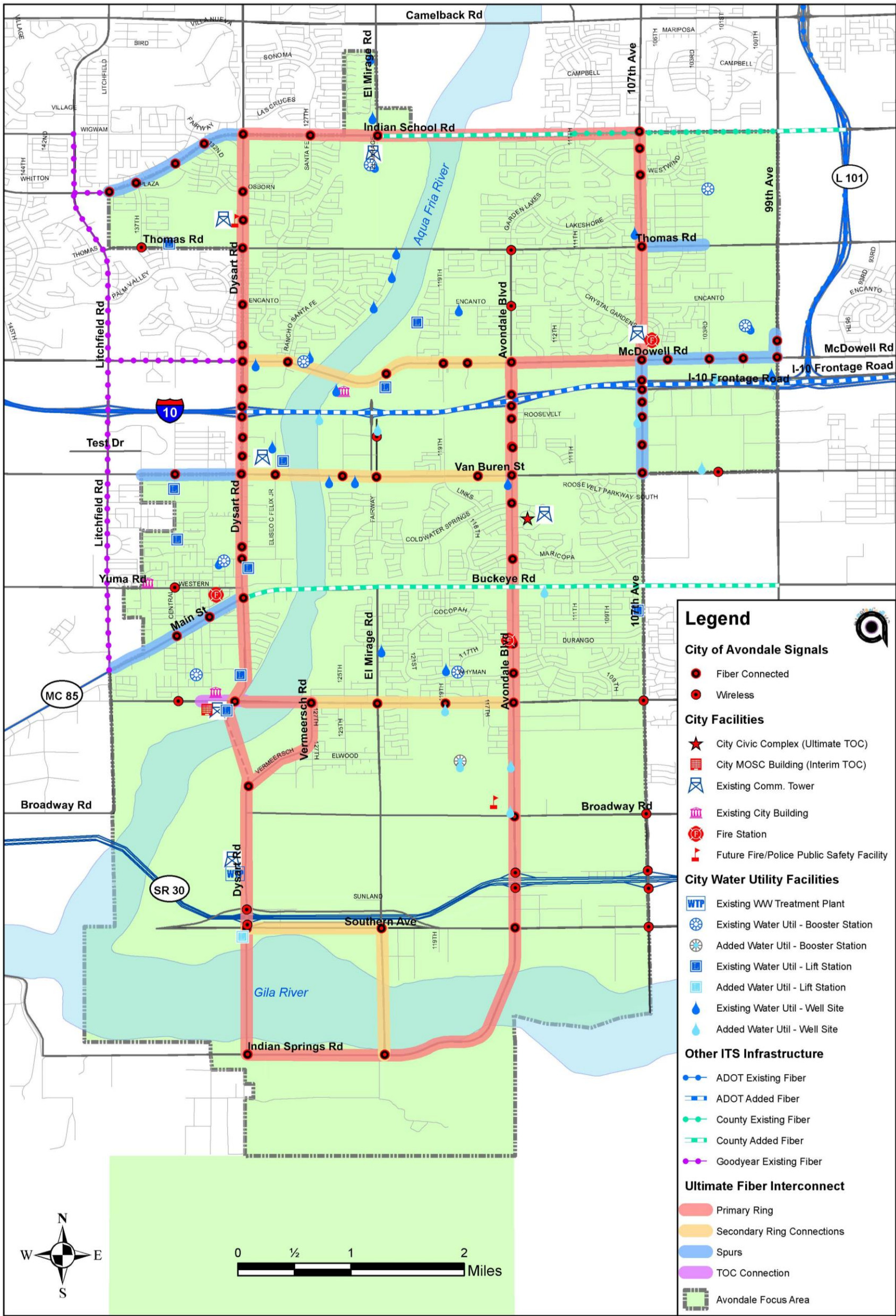
COST ESTIMATE SUBTOTALS	Capital	O&M / Yr	Avg. Life (yrs)	Total Lifecycle
Interim High Priority-A	\$ 342,998	\$ 1,481	20	\$ 372,610
Interim High Priority-B	\$ 82,040	\$ 664	20	\$ 95,325
Interim Medium Priority	\$ 305,278	\$ 901	20	\$ 323,296
Interim Low Priority	\$ 148,649	\$ 1,323	20	\$ 175,117
Long Term High Priority	\$ 1,143,352	\$ 3,083	15	\$ 1,189,601
TOTAL FOR INTERIM & LONG TERM HIGH PRIORITIES ONLY	\$ 2,022,316	\$ 7,452	15-20	\$ 2,155,948



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Figure 7.4 Ultimate ITS Communication Plan



Note: Gray Dashed Lines Indicate alternative roadway alignments subject to future studies.





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8. funding

Future transportation needs of the City, as identified in the preceding chapters, provides the foundation for determining funding needs. Once funding needs are determined, obtaining funding to satisfy those needs with proposed improvements is a challenging task. FHWA and the recent economic recession made “fiscal constraint” the go-to framework, even mind set, guiding the fiscal decision-making process. Although economic conditions have improved, there still is a need to apply principles of fiscal constraint, if for no other reason than the Federal transportation guidance requires it. This chapter will estimate the gross estimated costs to implement the envisioned transportation system and the possible funding sources.

summary of improvement costs

Based on the information and transportation system needs identified in previous chapters, a summary of the estimated transportation improvement costs is presented in Table 8.1. The cost estimates presented in the table rely on information from current City CIP projects, past estimates, and other sources. Although specific projects will encounter specialized costs such as utility relocations, atypical complications concerning right-of-way acquisition, etc., generally the construction cost estimate considered to improve one lane-mile of arterial roadway was \$1,500,000. One lane-mile of minor arterial roadway was estimated to cost about \$1,000,000, and one lane-mile of collector roadway was estimated to cost about \$750,000. If bridge construction/widening is involved, then the construction estimate is doubled. The \$100,000 per bike lane-mile cost estimate used for bike lanes (presumed in both directions) that are not associated with a related roadway widening project (which would already include bike lane provisions) was assumed to cover projects where only striping and/or minor widening/curb work was required. The transit improvement cost estimate was previously determined and carried over from the previous transportation plan update.

Tables 8.2 through 8.4 provide a detailed breakdown of improvement costs for roadways, bridges, and bike lanes. Improvement costs associated with ITS improvements were detailed previously. Tables 8.2a and 8.2b collectively represent total roadway projects. Table 8.2a exhibits the current City CIP summary of transportation related projects, including various projects identified in the recommended project list (previously detailed in the Street Plan Chapter). The CIP summary reflects a more detailed, comprehensive engineering cost estimate for the respective projects. Table 8.2b addresses the planning-level roadway improvement costs for future projects identified throughout the Horizon Year 2040 that were not immediately incorporated into the City’s CIP and are not included in Table 8.2a.



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Table 8.1 Summary of Improvement Costs

Roadway/Improvement Type	Number of Projects	Overall Lane-Miles to be Constructed	Estimated Construction Cost for Projects (1,000s)
Roadway/Intersections	60	53 (Does not include Capital Improvement Project miles)	\$153,988
River Bridges (new*)	4	12	\$146,029
Bike Lanes/trails not expected to be associated with roadway projects	21	22	\$2,193
Intelligent Transportation Systems Deployment**	n/a	n/a	\$2,156
Transit Improvements***	n/a	n/a	\$23,736
Total Estimated Cost (2017 dollars)^			\$328,009

* Includes alternate Dysart Road bridge over the Agua Fria River

** Interim and high-priority improvements only (does not include ultimate Transit Management Center cost).

*** Ultimate transit costs (capital and O&M) based on data from Transit Cooperative Research Program (TCRP) Report 78, average passenger-miles per capita (26.9), and the \$17.9M cost reported for the Avondale Transit Center at City Center (Avondale ITS Strategic Plan).

^ Additional costs not identified include right-of-way acquisition costs, design, O&M, and/or contingencies.



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Table 8.2a City of Avondale 2017 Refined Capital Improvement Projects Summary

CIP ID #	Road Segments and Intersection Improvements	Description	Cost	Fiscal Year(s) Construction
Development Fee Ineligible Projects				
ST1275	Western Avenue - Central Avenue to 4th Avenue	4-Lane Minor Arterial Upgrade	\$ 1,349,063	FY 2020
ST1380	Intersection Improvements - Roosevelt Street & 99th Avenue	Intersection Upgrade	\$ 1,278,632	FY 2020
ST1311	Washington Street - Dysart Road to 9th Street	2-Lane Local Street Upgrade	\$ 537,421	FY 2021
ST1309	MC85 - Litchfield Road to Agua Fria River Bridge	4-Lane Arterial Upgrade	\$ 6,968,643	FY 2021
ST1382*	McDowell Road & 107th Avenue - Dual Left-turn Lanes	Intersection Upgrade	\$ 500,000	FY 2019
Development Fee Eligible Projects				
ST1021	Dysart Road Extension - Whyman Avenue to Lower Buckeye Road	4-Lane Minor Arterial Upgrade	\$ 3,821,854	FY 2022
ST1021A	Dysart Road - Whyman Avenue to MC 85	4-Lane Minor Arterial Upgrade	\$ 2,989,473	FY 2023-2027
ST1125	Avondale Road - McDowell Road to Thomas Road	4-Lane Arterial Upgrade	\$ 2,379,905	FY 2021
ST1166	Avondale Road - Lower Buckeye Road to Miami Road	4-Lane Arterial Upgrade	\$ 1,640,651	FY 2022
ST1224*	Intersection Improvements & Well Relocation - McDowell Road & 107th Avenue	Intersection Upgrade	\$ 2,858,125	FY 2019
ST1265	Intersection Improvements - McDowell Road & Dysart Road	Intersection Upgrade	\$ 3,093,815	FY 2022
ST1336	Fairway Drive - Van Buren Street to Garfield Street	4-Lane Arterial Upgrade	\$ 2,648,127	FY 2020
ST1146	Van Buren Street - Fairway Drive to 121st Avenue (North Side)	6-Lane Arterial Upgrade	\$ 1,948,003	FY 2023-2027
ST1365	Intersection Improvements - Dysart Road & Rancho Santa Fe Blvd.	Intersection Upgrade	\$ 543,855	FY 2019
ST1334	Van Buren Street - Avondale Blvd. to 107th Avenue	6-Lane Arterial Upgrade	\$ 5,806,072	FY 2023-2027
ST1333	Litchfield Road - Lower Buckeye to Broadway Road	4-Lane Arterial Upgrade	\$ 4,951,693	FY 2023-2027
ST1172	El Mirage Road - Lower Buckeye Road to Calle Hermosa Street	4-Lane Arterial Upgrade	\$ 2,841,202	FY 2023-2027
ST1449	Traffic Signal / Intersection Improvements - Van Buren Street & 103rd Avenue	Intersection Upgrade	\$ 1,505,533	FY 2023-2027



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Table 8.2a City of Avondale 2017 Refined Capital Improvement Projects Summary Continued

CIP ID #	Road Segments and Intersection Improvements	Description	Cost	Fiscal Year(s) Construction
TBD	El Mirage Road - Indian Springs Road to Southern Avenue	4-Lane Arterial Upgrade	\$4,264,316	FY 2023-2027
TBD	El Mirage Road - Southern Avenue to Broadway Road	4-Lane Arterial Upgrade	\$3,682,971	FY 2023-2027
TBD	El Mirage Road - Broadway Road to Lower Buckeye Road	4-Lane Arterial Upgrade	\$3,396,884	FY 2023-2027
TBD	Broadway Road - Dysart Road to El Mirage Road	4-Lane Arterial Upgrade	\$4,411,473	FY 2023-2027
TBD	Broadway Road - El Mirage Road to Avondale Boulevard	4-Lane Arterial Upgrade	\$5,103,102	FY 2023-2027
Traffic Signal Improvements				
ST1170	Traffic Signal - Avondale Blvd. & Lower Buckeye Road	New Traffic Signal	\$730,200	FY 2022
ST1171	Traffic Signal - El Mirage Road & Lower Buckeye Road	New Traffic Signal	\$488,775	FY 2022
ST1180	Traffic Signal - 107th Avenue & Dealer Drive	New Traffic Signal	\$488,775	FY 2023-2027
ST1181	Traffic Signal - 107th Avenue & Roosevelt Street	New Traffic Signal	\$488,775	FY 2019
ST1187	Traffic Signal - 119th Avenue & McDowell Road	New Traffic Signal	\$730,200	FY 2023-2027
ST1188	Traffic Signal - 119th Avenue & Lower Buckeye Road	New Traffic Signal	\$488,775	FY 2023-2027
ST1195	Traffic Signal - Central Avenue & Lower Buckeye Road	New Traffic Signal	\$488,775	FY 2022
ST1248	Traffic Signal - Dysart Road & Lower Buckeye Road	New Traffic Signal	\$488,775	FY 2023-2027
ST1381	Traffic Signal - Maricopa Street & Avondale Blvd.	New Traffic Signal	\$730,200	FY 2018
ST1383	Traffic Signal - Broadway Road & Avondale Blvd.	New Traffic Signal	\$730,200	FY 2023-2027
ST1437	Traffic Signal - Thomas Road and 137th Avenue	New Traffic Signal	\$488,775	FY 2023-2027
ST1127	Traffic Signal - 107th Avenue & Pierce	New Traffic Signal	\$475,000	FY 2022

* Construction of ST1382 and ST1224 will occur together as one project – however due to individual components that are development fee eligible and non-development fee eligible, the projects appear separate in the CIP.



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Table 8.2b Planning-Level Roadway Improvement Costs

Roadway Improvement Extent		Proposed Lane Additions	Proposed Facility Type	Distance (Mi)	Cost	Project Year
Thomas Rd	127th Ave to 126th Ave alignment	2	4-Lane Arterial Upgrade	0.2	\$ 471,591	2030
Thomas Rd	126th Ave alignment to The Agua Fria	3	4-Lane Arterial Upgrade	0.5	\$ 2,446,023	2030
Thomas Rd	Agua Fria River to 118th Dr	3	4-Lane Arterial Upgrade	0.1	\$ 596,591	2030
Thomas Rd	118th Dr to 400' east of 116th Ave	2	4-Lane Arterial Upgrade	0.3	\$ 829,545	2030
McDowell Rd	117th Ave to Avondale Blvd	3	6-Lane Arterial Upgrade	0.5	\$ 2,386,364	2030
McDowell Rd	300' East of 112th Ave to 107th Ave	2	6-Lane Arterial Upgrade	0.5	\$ 1,551,136	2030
McDowell Rd	107th Ave to Aventura Way	1	6-Lane Arterial Upgrade	0.4	\$ 588,068	2030
Van Buren St	Agua Fria River to Fairway Dr	2	6-Lane Arterial Upgrade	0.4	\$ 1,238,636	2030
Van Buren St	121st to Avondale Blvd	2	6-Lane Arterial Upgrade	0.8	\$ 2,284,091	2030
Van Buren St	107th Ave to 105th Ave	2	5-Lane Arterial Upgrade	0.2	\$ 747,159	2030
Van Buren St	105th Ave to 99th Ave	3	5-Lane Arterial Upgrade	0.8	\$ 3,481,534	2030
Lower Buckeye Rd	Litchfield Rd to The Agua Fria Bridge	3	4-Lane Arterial Upgrade	0.9	\$ 4,261,364	2030
Lower Buckeye Rd	Agua Fria Bridge to El Mirage Rd	3	4-Lane Arterial Upgrade	0.5	\$ 2,215,909	2030
Lower Buckeye Rd	600' E of 121st Ave to Avondale Blvd	2	4-Lane Arterial Upgrade	0.8	\$ 2,375,000	2030
Lower Buckeye Rd	Avondale Blvd to 111th Ave	1	4-Lane Arterial Upgrade	0.5	\$ 735,795	2030
Lower Buckeye Rd	111th Ave to 107th Ave	2	4-Lane Arterial Upgrade	0.4	\$ 1,267,045	2030
Broadway Rd	Avondale Blvd to 107th Ave	3	4-Lane Arterial Upgrade	1.0	\$ 4,431,818	2030
Southern Ave	119th Ave to 107th Ave	3	4-Lane Arterial Upgrade	1.5	\$ 6,754,261	2030
Indian Springs Rd	Avondale western City Limits to El Mirage Rd	3	4-Lane Arterial Upgrade	1.6	\$ 7,329,545	2030
Dysart Rd/Vermeesch Rd	Lower Buckeye to Interim SR 30 (Southern)	3	4-Lane Arterial Upgrade	2.2	\$ 10,056,818	2030
El Mirage Rd	Durango St to Calle Hermosa St	1	4-Lane Arterial Upgrade	0.3	\$ 482,955	2030



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Table 8.2b Planning-Level Roadway Improvement Costs Continued

Roadway Improvement Extent		Proposed Lane Additions	Proposed Facility Type	Distance (Mi)	Cost	Project Year
Avondale Blvd	SR 30 to Miami Rd	1	4-Lane Arterial Upgrade	1.4	\$ 2,075,568	2030
Avondale Blvd	Southern Ave to SR 30	3	6-Lane Arterial Upgrade	0.5	\$ 2,301,136	2030
Avondale Blvd	980' North of Gila River to Southern Ave	1	6-Lane Arterial Upgrade	0.2	\$ 326,705	2030
107th Ave	I-10 to McDowell Rd	1	4-Lane Arterial Upgrade	0.2	\$ 269,886	2030
107th Ave	Southern Ave to Lower Buckeye Rd	3	4-Lane Arterial Upgrade	2.0	\$ 9,000,000	2030
99th Ave	Costco to Indian School	3	6-Lane Arterial Upgrade	1.8	\$ 8,145,170	2030
Total					\$ 78,649,713	



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Table 8.3 Planning-Level Bridge Improvement Costs

Roadway Improvement Extent		Proposed Lane Additions	Proposed Facility Type	Distance (Mi)	Cost	Project Year
Lower Buckeye Rd	Agua Fria Bridge	5	Bridge 4-Lane Upgrade	0.6	\$ 37,919,800	2030
Thomas Rd	Agua Fria Bridge	5	Bridge 4-Lane Upgrade	0.2	\$ 21,298,940	2030
Dysart Rd	Agua Fria Bridge	5	Bridge 4-Lane Upgrade	1.0	\$ 35,126,700	2040
Dysart Rd	Gila River Bridge	5	Bridge 4-Lane Upgrade	1.1	\$ 51,684,299	2040
TOTAL					\$ 146,029,739	



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Table 8.4 Planning-Level Bicycle Improvement Costs

Facility	Improvement	Directional	Priority	Distance (Mi)	Cost
103rd Ave	475' South of Encanto Blvd to Broadstone Gateway	Bidirectional	Currently Planned	0.2	\$34,091
Thomas Rd	Litchfield Rd to Dysart Rd	Westbound	High Priority	1	\$104,167
Thomas Rd	Dysart Rd to 127th Ave	Bidirectional	High Priority	0.5	\$92,803
McDowell Rd	119th Ave to 117th Ave	Bidirectional	High Priority	0.2	\$36,932
McDowell Rd	Rancho Santa Fe Blvd to Agua Fria	Bidirectional	High Priority	0.2	\$37,879
Van Buren Multi-Use Path	Agua Fria River to Avondale Blvd	Bidirectional	High Priority	1.6	\$195,600
127th Ave	South of the I-10 to Van Buren St	Bidirectional	High Priority	0.5	\$102,273
Coldwater Spring Blvd	126th Ave to Fairway Dr	Bidirectional	High Priority	0.4	\$75,758
Dysart Rd	Main St to Western Ave	Bidirectional	High Priority	0.1	\$22,727
Indian School Rd	1000' East of El Mirage Rd to Agua Fria Bridge	Westbound	Medium Priority	0.2	\$17,279
Central Ave	Van Buren St to Main St	Bidirectional	Medium Priority	1.7	\$344,697
Main St/Buckeye Rd	650' West of Central Ave to 900' West of El Mirage Rd	Bidirectional	Medium Priority	1.5	\$306,818
Buckeye Rd	900' West of El Mirage	Westbound	Medium Priority	0.3	\$34,091
Litchfield Rd/Main St	Lower Buckeye Rd to 650' West of Central Ave	Northbound/ Eastbound	Medium Priority	0.7	\$71,970
McDowell Rd	Avondale Blvd to 200' East of 112th Ave	Bidirectional	Low Priority	0.4	\$87,121
99th Ave	Indian School to I-10 Frontage Rd	Southbound	Low Priority	2.2	\$217,803
99th Ave	365' South of Pierce St to Van Buren St	Southbound	Low Priority	0.2	\$17,045
127th Ave	South of I-10 to Van Buren St	Bidirectional	Low Priority	0.5	\$102,273
Buckeye Rd	Avondale Blvd to 107th Ave	Bidirectional	Low Priority	1	\$196,970
Durango St Multi-Use Path	125th Ave to Agua Fria Trail	Bidirectional	Low Priority	0.2	\$24,627
Durango Channel Trail	Reroute Avondale Blvd West around SR30 ROW	Bidirectional	Low Priority	0.6	\$69,899
TOTAL					\$2,192,823



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funding sources

The following summaries of funding/revenue sources are presented as possible mechanisms for funding the City's transportation needs. Funding sources cover federal, state, and local levels. Each source has disbursement/administrative authorities that vary between the FHWA, ADOT, and MAG. Accompanying each summary is an example project that could benefit from the funding source. Although this information is not intended as a specific funding plan for any one project or recommended component of the City's overall transportation system, it presents a framework within which projects may be evaluate, rated, and prioritize for implementation.

federal funding sources

surface transportation program

The Surface Transportation Program (STP) provides flexible funding that may be used by States and localities for projects on any Federal-aid highway, including facilities on the National Highway System (NHS), State Highway System (SHS), bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities.

City Project Example – I-10/Fairway Drive interchange construction (ADOT project)

congestion mitigation & air quality program

The Congestion Mitigation & Air Quality Program (CMAQ) program was conceived to support surface transportation projects and other related efforts that contribute to improvement of air quality and provide congestion relief. Eligible uses of these funds administered by FHWA include, but are not limited to: ITS improvements; bicycle and pedestrian projects; particulate matter (PM) mitigation (PM_{2.5} microns and PM₁₀ microns); traffic flow improvements, in the form of added turn lanes; transit service expansions, through vehicle acquisition and facility development, and P&R lots. Passage of the Fixing America's Surface Transportation Act (FAST) in 2015 provides \$2.3 to \$2.5 billion through 2020. The FAST Act increased emphasis on diesel engine retrofits and alternative fuel infrastructure in designated alternative fuel corridors. Acquisition of transit vehicles for fleet expansion or replacement purposes requires a 20% local share. Public-Private Partnerships (P3) are permitted with the public entity being the project sponsor.

City Project Example – Adding turn lanes to a congested arterial roadway or general improvement to traffic flow, which can include encouragement of non-motorized or multimodal travel through construction of HOV lanes and the provision of bike lanes and bike accommodations at transit centers/stops.

community development block grant program

The Community Development Block Grant Program (CDBG) is a flexible program that provides communities with resources to address a wide range of unique community development needs. The CDBG entitlement program allocates annual grants to larger cities and urban counties to aid in developing viable communities. The emphasis generally is on the development and provision of: decent housing; a suitable living environment; and opportunities to expand economic opportunities in



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the community. HUD determines the amount of each grant by using a formula comprised of several measures of community need, which include: the extent of poverty; population; housing overcrowding; age of housing; and population growth lag in relationship to other metropolitan areas.

Proposed projects must meet one of the following national objectives for the program: benefit low- and moderate-income persons and prevention or elimination of slums or blight. The project(s) also can be focused on addressing community development needs that are particularly urgent, because existing conditions pose a serious and immediate threat to the health or welfare of the community for which other funding is not available.

Since the Year 2000, overall funding for block grants targeting the Nation's low- and moderate-income population has been reduced 27 percent in inflation-adjusted terms. In March, 2017, President Donald Trump presented a budget proposal that would effectively eliminate four discretionary block-grant programs. The Center on Budget and Policy Priorities concluded that the CBDG likely would be one of those programs, losing \$3 billion in funding. Therefore, until the current budget cycle is completed, it should be assumed, based on the budget information submitted thus far, that CDBG may not be available in the future or could be drastically reduce in size and scope.

City Project Example – Constructing sidewalk extensions/connections or bike lanes to improve community mobility and interaction.

federal transit administration

The Federal Transit Administration (FTA) sponsors two types of grant programs. Formula grant programs are Federal funds are channeled to States based on formulas recognizing population. This activity is conducted with the framework of the Formula Grant Program. The Discretionary Grant Program, in contrast, gives the Administrator of FAT the authority to award funds based on applicant's proposals. Projects are selected for funding based on selected criteria specific to each category of projects. Each grant program is referred to by name, and most programs also are referenced by a number that correlates to the section number of Title 49 of the United States Code.

5307 Urbanized Area Formula Grant Program - Federal resources are allocated to states and urbanized areas by formula for transit-related projects and operating assistance.

City Project Example – The City already receives this grant money, although its share may diminish with the agglomeration of urbanized areas (UZA).

5309(b)(2) Capital Investment Grant Program – This program (often referred to as the Fixed Guideway Modernization Program) provides funding for major transit capital investments, including heavy rail, commuter rail, light rail, streetcars, and bus rapid transit. It is a discretionary grant program is unlike most others in government in that a series of steps over several years is required to attain eligibility for funding.

City Project Example – Avondale has no fixed guideway systems or concrete plans for such a system that would qualify for this program. However, this program potentially would be used by Valley Metro to expand the existing Metro Light Rail system, and, if the program



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is still authorized and funded in the future, it could support development of HCT with connectivity to the regional HCT system.

5310 Enhanced Mobility of Seniors & Individuals with Disabilities Program – This is a formula-based funding program providing resources to states for the purpose of assisting private, nonprofit groups in meeting transportation needs of the elderly and persons with disabilities.

City Project Example – Tapping this program may be helpful in advancing improvements relating to the accessibility and mobility of the City's residents who rely on the Dial-A-Ride and Taxi Voucher service.

5317 New Freedom Program – This grant program provides funds for new public transportation services to overcome existing barriers for persons facing mobility disadvantages when seeking integration into the workforce and full participation into society. It also has the objective of expanding transportation mobility options available to persons with disabilities beyond requirements of the requirements of ADA. Grant funds must be used to expand the range of transportation services to persons with disabilities, such as the acquisition of new vehicles or the purchase of additional service capacity. In addition, funds may be used to finance capital and operating expenses for new projects and/or services that go beyond the requirements of the Americans with Disabilities Act (ADA).

City Project Example – Projects to enhance mobility of ADA-eligible residents in relation to existing bus services and potential future light rail and/or commuter rail service within the City.

highway safety improvement program

The overall purpose of the Highway Safety Improvement Program (HSIP) is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements. ADOT recently completed an update of the State Highway Safety Plan (SHSP) in accordance with Federal stipulations associated with the program. Strategic Transportation Safety Plans (STSP) are developed at the state and regional level with input from a wide range of experts, transportation and safety officials, and the general public.

MAG issued the first STSP for the region in 2005 and is currently updating the latest version. The MAG STSP is coordinated with the State SHSP relying on regional transportation safety initiatives, projects, and studies. The STSP establishes the regional vision, goals, objectives, strategies, countermeasures, and performance measures for making systematic improvements in transportation safety. In February of this year, MAG issued a call for projects from member agencies to facilitate programming and funding in FY 2018, FY, 2019, and FY 2020. Project applications must be submitted via email to: hsip@azmag.gov by 10:00 a.m. on Monday September 18, 2017. Eligible projects, or safety countermeasures, include, but are not limited to: signalization of intersections, pavement markings, intersection and roadway design changes/improvements, improved bicycle accommodations, improved lighting and signage, understanding behavioral tendencies of travelers, enhanced pedestrian



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crossings, commuter carpooling and vanpooling, hail-highway crossing closure education and enforcement programs/campaigns, improvement of crash data collection methods, and changing stop locations of transit vehicles.

City Project Example – Possible mitigation/countermeasures determined from the outcome of the recommended safety evaluations for the specific roadways/intersections discussed in Chapter 4 should be considered for submittal to the next call for projects by MAG.

federal bridge program

The Federal Bridge Program provides funding assistance to repair or replace aging bridge infrastructure.

City Project Example – Potentially, one of the five existing bridges within the city limits could require major repairs or replacement within the next 20 years. Although two bridges are associated with County-controlled roadways at this time, the current condition may change or the City may want to partner with the County, should action need to be taken.

pedestrian/bicycle projects

Depending on the context of the project, a number of federal funding programs pertain to pedestrian or bicycle provisions within a community, including: STP (i.e., State allocations for Transportation Enhancement Activities and Hazard Elimination and Railway-Highway Crossing programs), CMAQ, Recreational Trails Program, National Scenic Byways Program, Job Access and Reverse Commute Grants, Discretionary Livability Funding, the CDC's Nutrition and Physical Activity Program, and Safe Routes to Schools.

City Project Example – Any applicable location depending on the funding source requirements.

fixing america's surface transportation act

The Fixing America's Surface Transportation Act (FAST) succeeded the Moving Ahead for Progress in the 21st Century Act (MAP-21) and incorporated many of the previous Act's features and funding programs, although some were redefined and merged to streamline project delivery. It continues support for highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The Act authorizes \$226.3 billion for Federal-aid highway programs while shifting the focus to make the Federal surface transportation more streamlined, performance-based, and multimodal. Provisions of the Act address challenges facing the U.S. transportation system, including: improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery. The FAST Act builds on the changes made by MAP-21.

City Project Example – Any transportation project relating to capacity, safety, transit, pedestrian, and others.



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intelligent transportation systems

The FAST Act continues the Intelligent Transportation Systems (ITS) program contained in previous national transportation funding legislation. The legislation makes available \$100 million annually through FY 2020 for the research, development, and operational testing of ITS aimed at solving congestion and safety problems, improving operating efficiencies in transit and commercial vehicles, and reducing the environmental impact of growing travel demand. The current focus of the ITS Program is achievement of significant reductions in crashes through advanced safety systems.

City Project Examples – Any improvements in traffic operations and safety that can take advantage of the evolving technology defining ITS, such as: interoperable wireless communications among surface transportation vehicles of all types, traffic signals, other infrastructure systems, pedestrians, wireless devices, and automated vehicle systems.

State and Local Funding Sources

state shared revenue sources

A summary of key State-supported funding assistance sources is provided in Chapter 7.

City Project Examples – Roadway bridge widening; Arterial road widening; Expansion and or increased frequency of the Avondale ZOOM Circulator; Improvement relating to other elements of the overall long-range transit plan.

regional funding sources

See description for the Local Transportation Excise Tax in Table 7.3.

City Project Example – Roadway and or intersection improvements involving a Road of Regional Significance.

local funding sources

Pay-as-you-go financing is a major form of local funding source, so is the sale of bonds. Local funding for improvement projects generally comes from four sources, described as follows:

- Development Fees – Revenue collected from developers by the City to provide services, such as fire, police, library, parks, water, sewer, transportation, and general governmental assessments.
- Sales Tax – Revenue collected through the 2.5% transaction privilege (sales) tax to finance the cost of various City services such as police, fire, parks and recreation, streets, mass transit, etc.
- Operating Funds Transfers – The transfer of operating funds by the City to supplement their five-year capital budget to help address the impact of current residents on public infrastructure.
- Replacement Funds – Funding set asides (e.g., sinking funds) to replace or maintain capital items (e.g., vehicles, major equipment).

Within a framework of fiscal constraint, combining improvement efforts can be an effective use of limited funding amounts and sources.

City Project Example – Implementation of ITS measures (see above) is one way of addressing both of these financial positions. ITS improvements not only offer traffic



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communications/monitoring capabilities—a means to ensure adequate sufficient roadway operations/provisions are being maintained (and roadway capacities preserved)—but these projects also can be a critical benefit to police and emergency services and their related priorities. Other improvement/funding partnerships may be possible involving neighboring cities/agencies, private sector entities, non-profit groups, and academic institutions.



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9. recommendations & implementation

This section summarizes the major findings, recommendations, and strategic implementation policies of the Avondale Transportation Plan from the previous sections of the report. The recommendations to be implemented will be categorized as immediate (within a year), near-term (between 1 and 10 years), mid-term (10 to 15 years), and long-term (15 to 20 years).

findings and recommendations

The information and analyses developed during preparation of this update of the City's transportation plan provide the basis for the following findings and recommendations regarding the future transportation network available to Avondale's residents.

traffic circulation

Within the 2040 planning horizon, the prominent mode choice amongst travelers is by large the personal automobile, and updating the roadway network to accommodate the future travel demand by such means is essential to sustaining a growing and prosperous city. However, while roads and streets represent the typical starting point of a transportation network, planning efforts should focus around providing multi-modal options as identified in MAG's *Complete Streets Guide* and throughout this Transportation Plan Update. The findings resulting from the street plan are summarized in this section below.

findings

The existing roadway network is able to adequately facilitate the City's current travel demand. However, as discussed in Chapter 4, several roadway improvements must be implemented by Years 2030 and 2040 to maintain adequate LOS and sustain the City's growth in the respective areas. These roadway improvements are vital to the City's traffic circulation plan as they coincide with areas projected to experience the highest increases in socioeconomic growth. The key recommendations for the circulation plan in the near term, 2030, and 2040 horizon years are summarized below.

recommendations (near-term and mid-term, 1-15 years)

- Increase roadway capacity along McDowell Road by expanding segments between 117th Avenue to Harbor Shore Boulevard to six lanes.
- Increase roadway capacity along Van Buren Street between Agua Fria Bridge and 107th Avenue by expanding the roadway to six lanes and expanding the segment between 107th Avenue and 99th Avenue to five lanes.
- Construct a new 4-lane bridge over Agua Fria River to provide connectivity along Lower Buckeye Road, where there is currently only a low-water crossing. Also increase the roadway capacity along all segments of Lower Buckeye Road by expanding the roadway to four lanes.



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- Construct a new 4-lane roadway along the Broadway Road alignment from Dysart Road to Avondale Boulevard as well as increase the capacity along all existing segments of Broadway Road by expanding the roadway to four lanes.
- Increase roadway capacity along Southern Avenue between 119th Avenue and 107th Avenue by expanding the roadway to four lanes.
- Increase roadway capacity along all existing segments of Indian Springs Road by expanding the roadway to four lanes, where it is not already expanded.
- Increase roadway capacity along Litchfield Road from Lower Buckeye Road to Broadway Road by expanding the roadway to four lanes.
- Increase roadway capacity along Dysart Road from Buckeye Road to Southern Avenue (including the Dysart/Vermeersch Road alignment) by expanding the roadway to four lanes.
- Increase roadway capacity along El Mirage Road by expanding the roadway to four lanes from Durango Street to Indian Springs Road.
- Increase roadway capacity along Avondale Boulevard from Thomas Road to McDowell Road by expanding the roadway to four lanes.
- Increase roadway capacity of Avondale Boulevard south of the Interim SR-30 to Southern Avenue by expanding the roadway to six lanes –based on continued coordination with ADOT on SR-30 design as well as input from event traffic management personnel.
- Reconstruct the existing 4-lane section Avondale Boulevard between Lower Buckeye Road and SR-30 to bring the facility to current City standards.
- Increase roadway capacity along segments of 107th Avenue from McDowell Road to Southern Avenue by expanding the roadway to a four lanes, where it is not already expanded.

recommendations (long-term, 15-25 years)

- Construct a new 4-lane bridge over the Gila River to provide connectivity along the Dysart Road corridor, where no roadway access currently exists; consider an additional bridge crossing on Dysart Road over the Agua Fria River.
- Increase roadway capacity along Thomas Road between 127th Avenue and Avondale Boulevard by expanding the roadway to four lanes where right-of-way permits, complementing the construction of the bridge crossing on Thomas Road over the Agua Fria River.
- Regarding the overall roadway system – obtain and preserve right-of-way necessary to accommodate the buildout of the arterial cross-sections per the prescribed roadway classifications presented in this plan.



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- Establish access control standards, coordinating with ADOT, regarding the future SR-30 freeway and ensure that as development increases, the street system remains compatible with future freeway accessibility/operations.
- Coordinate improvements of roadway segments at the periphery of the City with adjacent cities/agencies to provide a consistent facility type along travel corridors for more comprehensive improvement strategies.

transit

Healthy Sustainable Communities rely on provision of model alternatives for their residents. Therefore, it is essential to continue to expand transit services throughout the MPA to allow residents access to key activity centers, both within the City and to connect to its neighboring jurisdictions. The TOD Element of the General Plan 2030 provides strategies to promote transit through appropriate land use decisions. In turn, it is necessary for this Transportation Plan to respond to these areas of future TOD.

findings

With most of the region's major employment centers located away from the City of Avondale, future transit service improvements need to focus on higher quality services being available and directly connectivity with major activity areas through the regional transit network. The recently completed Avondale Transit Center provides residents with more convenient access to Express Bus. Expanded local services, as identified in Chapter 5, also should be pursued to improve and assure resident's reasonable and convenient access to nearby activity centers, including Gateway Pavilions, Estrella Mountain Community College, and others.

recommendations

- Work with Valley Metro to assure extension of Route 29, as presented in City of Avondale Transit Implementation Plan (refer to Figure 5.3). This is consistent with the Valley Metro mid- to long-term the Recommendations tentatively scheduled for October, 2019. The route performed well when in operation, and its route is within an underserved area of the City.
- Reinforce current user base by enhancing existing, or introducing new, transit amenities at established bus stops.
- Work with Valley Metro to maintain 20- to 40-minute headways (30 minutes outside peak hours) on all bus routes and increase ridership levels.
- Establishment of a direct connection of the Avondale Transit Center on Roosevelt Street, east of Avondale Boulevard, as an integral part of the BRT/RAPID/Express Bus network with groundwork for direct connection with LRT service to the City in the I-10 corridor.
- City policy and planning efforts relative to the UPRR corridor, should focus on preserving rights-of-way (especially around Avondale Boulevard and the Litchfield Road-Dysart Road segment) for transportation purposes, principally supporting the proposed CR service for the



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Southwest Valley. Right-of-way preservation should include promotion of land use planning for the entire length the CR line through the City with targeted planning for station areas. Various policy and planning steps should be scheduled in this regard:

- Work with the City's regional transportation partners to identify the specific right-of-way needs for a high-capacity transit route through the I-10 corridor and along the UPRR to include associated station areas, and ensure—through policy actions—that any future development would not encroach on this right-of-way;
- Identify suitable parcels for future station sites and related transit and access functions;
- Facilitate land use and urban design actions—to be adopted as part of the City General Plan 2030, and included in subsequent planning and zoning documents—that would be supportive of future transit usage;
- Adopt or abide by the transit functional classifications presented and described in Chapter 5 of this plan; and identify/preserve the prescribed transit routes and station locations identified in the Long Range Transit Plan within Chapter 5.

bike lanes

Bike lanes also provide road users additional options for their travel needs, which then translates into less vehicular demand on the City's roadways. They also support the General Plan 2030 vision for a Healthy Sustainable Community. The Plan has identified opportunities to provide additional bicycle connectivity on existing streets, and the standard roadway cross-sections incorporate bicycle facilities when roadway are expanded or new roadways are constructed.

findings

The City has established sub-networks for bikeways, which can be systematically connected and expanded. There are currently about 127 directional miles of bikeways provided on collector and arterial roadways within the City and 29 miles of trails. The inclusion of bike lane provisions in the standard roadway cross-sections ensures that future wide-spread improvements to roadways (whether existing or new) also will be extending the bike lane provisions throughout the City.

recommendations

- Continue to require partial or full buildout of roadway cross-sections to be per City standards so that adequate pavement/provisions are implemented to permit bike lanes and adjacent sidewalks.
- Incorporate introduction of bike lanes as part of roadway re-striping efforts, to the extent permissible based on the specific geometry (lane widths) of the subject roadway or segment.
- Provide bi-directional improvements where current facilities on arterial roadways exist on only one side.
- Provide a multi-use path on the El Mirage Road alignment from Broadway road to Indian Springs Road to ensure bicycle accessibility to future developments to the south.



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- Communicate with adjacent city/agency efforts on implementation of bike lanes/bikeways, so a coordinated effort can result in a more immediate realization of the bikeway network and/or interconnection of sub-networks.
- Program bike lane improvements in conjunction with roadway improvements and pavement preservation projects as possible, otherwise follow prescribed Bicycle Improvement Plan presented in Chapter 6 as funding and opportunities become available.

safety

Safety is an important element of the Transportation Plan Update, because it directly pertains to the welfare of the traveling public. The analysis of crash characteristics can be indicative of improvements needed that would also benefit overall traffic operations. The recently completed STSP presents key strategies to enhance safety throughout the City.

findings

From the STSP, the City of Avondale experienced 5,368 total crashes from 2010-2014. Of the total crashes, 1,315 (or 24.5%) were freeway crashes and the remaining 4,053 (or 75.5%) were arterial/local roads crashes. The plan identified Dysart Road/McDowell Road, Dysart Road/Van Buren Street, and 107th Avenue/McDowell Road as the intersections with the highest crash severity. Similarly, Dysart Road and McDowell Road had the roadway segments with the greatest crash severity.

recommendations

- Conduct a more specific safety assessment (including detailed analysis of crash types, causes, trends) along the Dysart and McDowell Road corridors.
- Consider geometric improvements and/or signal control modifications at the intersections exhibiting higher crash rates, as some of the crashes may be a result of inadequate capacity/inefficient operations.
- Adhere to the implementation strategies set forth in the STSP

advanced traffic management systems

Advanced Traffic Management Systems, or Intelligent Transportation Systems (ITS), are a complementary means of getting the most out of the roadway infrastructure and system that serves the City. Therefore, ITS can improve the efficiency and safety of the transportation system and its users by providing the City with enhanced means of monitoring and addressing traffic needs.

findings

There are four main ITS issues facing the City: traffic signal communication/coordination, traveler information dissemination, event management, and limited resources to implement ITS improvements. Establishment of a fiber-optic backbone/ring system is needed to facilitate future functionality and usefulness of ITS elements.



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recommendations

The delineation and prioritization of the ITS improvements are presented as part of Chapter 7, which is excerpted from the City's ITS Strategic Plan (July, 2010) and includes a proposed implementation plan.

implementation

The various elements that make up the Transportation Plan Update are intertwined such that implementation is not a simple process. Selection to move forward with roadway widening/construction projects will be inherently biased to receive most of the funding. However, as indicated above, improving transit, bicycle, pedestrian, and ITS elements have an additional benefit to the roadway system and the accommodation of the prominent vehicular demands. So as not to lose sight of this interdependence of the elements making up the City's transportation network, funding and monies should be sought in a comprehensive manner. Given that some federal funding and grants are specifically earmarked for certain projects (like transit or bicycle), they should be pursued in conjunction with other funding directed to overall roadway construction/improvement.

Projects that can combine improvements to more than one of the transportation system elements are understandably more desirable than carrying out separate projects that may only improve one transportation element for one particular roadway/segment at a time. In lieu of projects pertaining to multiple elements, the City should deliberately program improvement projects that at least address all elements in a logical fashion—perhaps proportioned within each iteration of the 5-year CIP (see Table 9.1).



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Table 9.1 Suggested Improvement Implementation Plan

Timeframe	Transportation Plan Element	Improvement Project Type
Within next 5 years	Roadways	Address “Near-Term” Recommendations
	Transit	Re-establish discontinued transit route; implement an element of the plan
	Bicycle	Complete 50% of the high priority bike lane projects
	Safety	Follow-up on prior mitigation, perform updated comprehensive crash history assessment
	ATMS	Follow specific implementation plan
Within next 10 years	Roadways	Address “Mid-Term” Recommendations
	Transit	Secure station site for major/high capacity transit service, preserve right-of-way for potential light rail route
	Bicycle	Complete remaining high priority projects; complete “gaps” in network created by various developer and/or roadway projects
	Safety	Address new/different safety issues identified
	ATMS	Follow specific implementation plan
Within next 15 years	Roadways	Address “Long-Term” Recommendations
	Transit	Complete the implementation of the Long Range Transit Plan
	Bicycle	Complete newly determined high priority projects while expanding the overall bike/pedestrian network
	Safety	Address new/different safety issues identified
	ATMS	Follow specific implementation plan