CITY OF MARICOPA®

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Area Transportation Plan

Transportation Master Plan & Regional Connectivity Plan

December 2015

FINAL REPORT

Prepared by :

WILSON & COMPANY

AREA TRANSPORTATION PLAN

Transportation Master Plan & Regional Connectivity Plan

Prepared by

Engineers & Architects

December, 2015

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INTRODUCTION

This Area Transportation Plan (ATP) has been developed to serve as the City's Long-Range Transportation Plan (LRTP). The ATP specifies policies, projects, and programs necessary to maintain, manage, and improve the community's transportation systems over a 25-year planning horizon and Buildout, considered to refer to a timeframe 40 to 60 years from the present. The ATP, therefore, is an integrated planning document addressing transportation needs relative to existing and anticipated future land use patterns that responds to policies associated with environmental quality and community quality of life. The ATP consists of two components: the Transportation Master Plan (TMP) and the Regional Connectivity Plan (RCP).

The ATP flows on previous planning efforts conducted by the City, including the *Small Area Transportation Study* (SATS) completed in 2005 and the *City of Maricopa Regional Transportation Plan Update* (2008 RTP Update) prepared in 2008, which was never formally adopted. Subsequent to completion of the SATS and 2008 RTP Update, the City was impacted by the most severe recession since the Great Depression. The period of the recession officially lasted from December 2007 through June 2009. The City's housing market was severely affected, new home starts came to a standstill and a large number of home owners were forced to vacate the community. Then, in 2010, the US Census of Population was conducted. The new Census results served as the basis for new growth projections from the Arizona Department of Administration (ADOA) that required adjustments to regional travel demand models. In addition, federal programs providing funding support for local transportation projects changed to include a requirement to address transportation needs in an integrated manner across all modes of travel. This "multimodal" approach removed the emphasis on roadways and established the need to examine full integration of roadways, transit, bicycle paths, and pedestrian facilities.

Also, subsequent to the 2010 Census, the City made a decision to join the Maricopa Association of Governments (MAG). MAG is a Metropolitan Planning Organization (MPO) created under federal mandate to provide a vehicle for channeling federal funding for transportation projects and programs through a regional planning process. Regional economic connections within Maricopa County and the wealth of MAG resources were important factors in this decision. As a member of MAG, the City must provide input to MAG's "NextGen" RTP, which will provide policy and project guidance for the MAG Region over the next 20 years. The City also is preparing an update to its 2006 *General Plan*. Preparation of the ATP, TMP, and RCP will provide necessary information for the required Circulation Element, Transit Element, and Non-Motorized (i.e., pedestrian and bicycles) Element of the community's *General Plan*.

TRANSPORTATION MASTER PLAN

1.0 TRANSPORTATION MASTER PLAN

The focus of the Transportation Master Plan is detailed studies and analyses of transportation system conditions and future needs for the area within the current City limits, identified annexation areas, as well as the Municipal Planning Area (MPA). The MPA represents a jurisdiction's broad area of planning concern based on its anticipated future corporate boundaries. More specifically, the MPA is that area with a reasonable expectation of population growth and particularly suitable for planned multimodal transportation and infrastructure expansion and improvements designed to support planned concentration of a variety of uses, such as residential, office, commercial, tourism and industrial uses.

This TMP presents an update of the previous 2008 RTP Update. The 2008 RTP Update encompassed the entire Maricopa MPA. This TMP likewise addresses the transportation needs of the Maricopa MPA. It establishes long-range plans for future development of streets, transit services, bicycle and pedestrian facilities, and intelligent transportation systems (ITS) within the City and the MPA. It also provides a framework for the planning of Complete Streets, a roadway design concept or treatment intended to provide accommodations for all travelers regardless of age or ability.

1.1 STUDY AREA

The Study Area for the TMP is comprised of the City of Maricopa, the City's MPA, and the Ak-Chin Indian Community, as illustrated in Figure 1-1.

CITY LIMITS

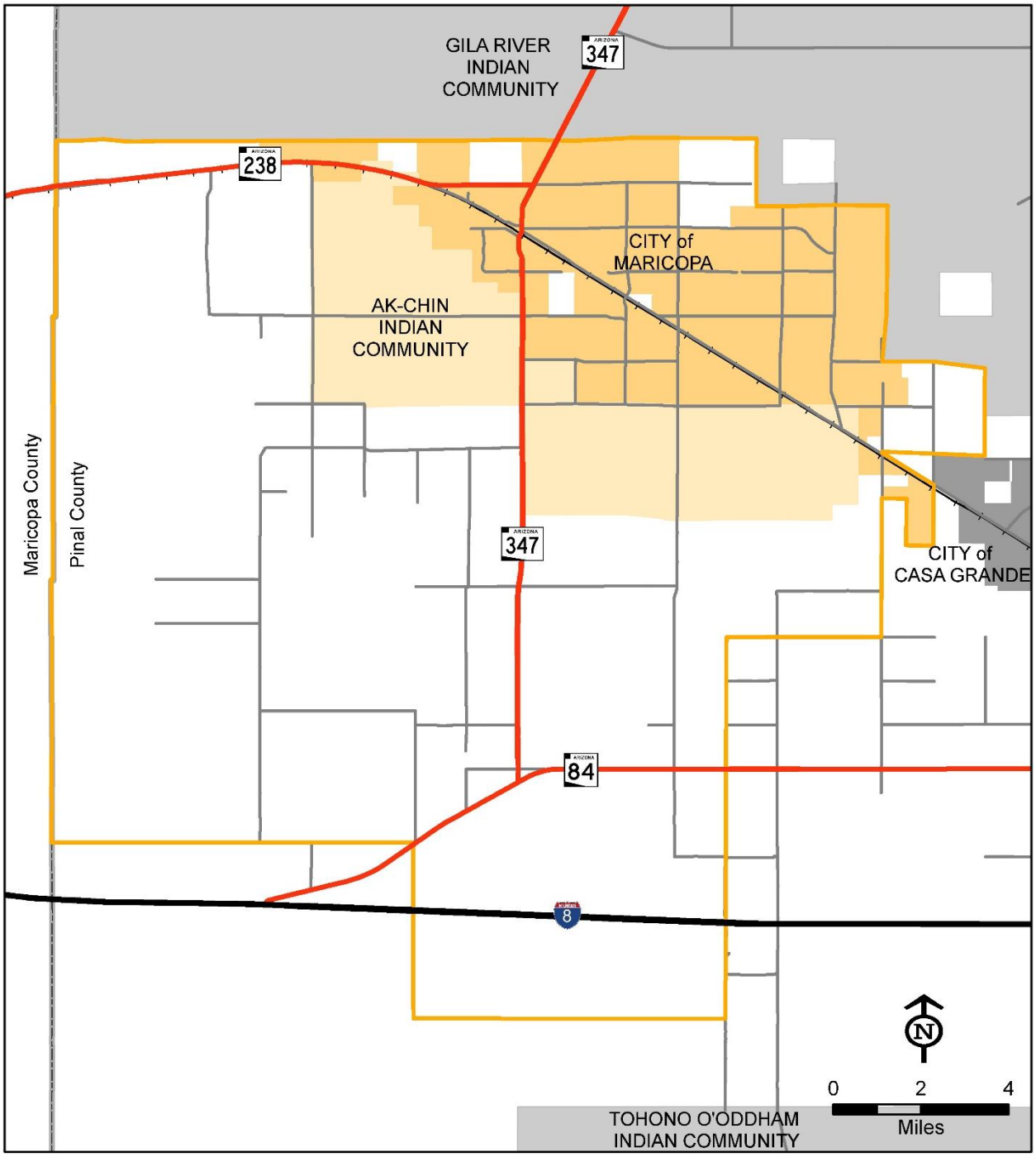
The City of Maricopa has expanded several times through annexation, since its incorporation in October 15, 2003. The current City limits stretches from the Gila River Indian Community boundary on the north, Anderson Road, Santa Rosa Avenue, and Russell Road on the east to Warren Road on the west, north of the Union Pacific Railroad (UPRR) corridor (refer to Figure 1-1). The City encompasses almost all of the land east and north of the Ak-Chin Indian Community to the southern boundary of the Gila River Indian Community. Recent extensions of the City boundaries through annexation have resulted in expansion to the southeast, south of the Maricopa-Casa Grande Highway (MCGH), and northwest between the UPRR corridor and the southern boundary of the Gila River Indian Community.

MUNICIPAL PLANNING AREA

According to the City of Maricopa *General Plan* 2006, approved by popular vote in May 2006, the City's MPA (illustrated as the TMP Study Area in Figure 1-1) provides a framework to manage resources and future growth. Creating the MPA allows the City to effectively plan contiguous areas expected to become urbanized with a 20-year forecast period. The 2006 *General Plan* MPA was adopted for the 2008 RTP Update and is the appropriate planning area for the TMP. The Maricopa MPA boundaries include approximately 270 square miles of western Pinal County and encompass the Ak-Chin Indian Community.

A significant feature of the MPA and the community's transportation system is the presence of the UPRR corridor, which traverses the Study Area in a northwest-by-southeast direction. The MCGH parallels the rail corridor for much of its length between Casa Grande and SR 347 in Maricopa. Currently, 60-plus daily freight trains and six weekly Amtrak trains cross through the town center of Maricopa. More importantly, Amtrak's Orlando-to-Los Angeles service – Sunset Limited – and Chicago-to-Los Angeles service – Texas Eagle – have scheduled stops in Maricopa. The Amtrak station, which is the closest Amtrak access point

Figure 1-1 | Transportation Master Plan Study Area



Legend

TMP Study Area | Ak-Chin Indian Community | City of Maricopa

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for the greater Phoenix area, is located at the southeast corner of John Wayne Parkway (SR 347) and the MCGH. A new Amtrak station, approximately one mile west of the present location, is in the design stage and will be integral with the planned Maricopa Transportation Center. Also, planning has been completed for a grade-separated interchange at SR 347 and UPRR.

AK-CHIN INDIAN COMMUNITY

The Ak-Chin Indian Community occupies a reservation of approximately 33 square miles that sits astride SR 347 on the southern edge of the City of Maricopa. The mostly agrarian community currently has an active enrollment of over 1,000 tribal members and is considered to be one of the largest farming communities in the U.S., harvesting products from over 15,000 acres. Although the Ak-Chin Indian Community technically is not part of the Maricopa MPA, Harrah's Ak-Chin Hotel and Casino Resort and the UltraStar Multi-tainment Center at Ak-Chin Circle are significant destinations that result in considerable travel demand affecting SR 347 and Maricopa traffic. Expectations are that the Ak-Chin Indian Community will continue to expand its offerings to the public.

PENDING ANNEXATION ACTIONS

The City of Maricopa supports property owners who request to have their land annexed into the City. Annexing undeveloped land, allows the City to directly influence development actions through the City's zoning ordinance. The TMP for the MPA allows the City to establish plans and other guidance to assure the newly developing areas provide adequate roads, parks, and open space to accommodate projected growth. As development pressures progress, the City of Maricopa has been engaged in responding to landowners' requests to annex into the areas southeast and west of current boundaries (refer to Figure 1-1). The City has been requested to participate in a large annexation south of MCGH and east of Anderson Road, known as the Santa Cruz Ranch (SCR), Version 1.This proposed annexation action experienced several complications and setbacks. Therefore, the annexation area was reduced into several smaller separate annexation agreements. The Ak-Chin Bunger property annexation was completed first (±677 acre Airport/Industrial Tract), followed by the Anderson-Russell Annexation (±831 acres). The next annexation, still being negotiated, is the remainder of Santa Cruz Ranch, Version 2. Additionally, an Intergovernmental Agreement with the Ak-Chin Community (signed August 7, 2012) acknowledges the existence of a 66-foot public road easement along the north side of Anderson Road and 33-foot public road easement along Peters & Nall Road. These agreements are summarized in Table 1-1.

Table 1-1 | Recent and Pending Annexations

Annexation	Approximate Acreage	Completed?
Ak-Chin Airport Industrial	677 acres	Yes
Anderson-Russell	832 acres	Yes
Santa Cruz Ranch	Not Listed	No
Santa Cruz Ranch Future State Land	Not Listed	No
Ak-Chin Intergovernmental Agreement		Yes
Source: City of Maricopa Development Services Department		

It is clear, based on the current position of the City in relationship to the expansive boundaries of the planning area to the south, that the City's growth through annexation will be extremely dynamic and generally unpredictable for the purpose of long-term transportation planning. This places greater emphasis on understanding and forecasting travel demand within the MPA and travel patterns among and between the major points of origin and destination that impact traffic volumes and transportation infrastructure needs. For this reason, the information and data presented in the following sections focuses on the Study Area, which encompasses both the MPA and Ak-Chin Indian Community. Nevertheless, inter-regional connectivity is of equal importance to the social and economic welfare of Maricopa and its continued future growth and prosperity, particularly access to the Phoenix metropolitan area and connectivity with proposed east-west routes that provide access to neighboring communities in Maricopa County to the west and Pinal County to the east.

1.2 STUDY PURPOSE

The purpose of this study is to develop an ATP for the City of Maricopa MPA. The ATP will be a multimodal plan that charts the City's transportation future and serves as a guide for strategic investment decisions over a long-range planning horizon, defined by the Years 2015–2040 and beyond. Development of the ATP will focus on the following areas:

- Updating the information from the aforementioned 2008 RTP Update, which focused on the City's MPA;
- Establishing conformance with growth expectations derived from official projections of the ADOA, as refined and adopted for use in the Central Arizona Governments (CAG) Regional Transportation Plan (RTP);
- Updating travel demand modeling to assure consistency with the statewide and regional planning frameworks of the Arizona Department of Transportation (ADOT) and MAG, respectively;
- Creating a City TMP for the immediate environs of the City and identified future annexation areas; and
- Establishing long-range regional connectivity needs for preservation of right-of-way for the Buildout period of 40 to 60 years.

The final ATP and TMP will be multimodal plans for transportation facilities and services to serve the City well into the future.

1.3 STUDY PROCESS

The City of Maricopa ATP process will be coordinated with the Ak-Chin and Gila River Indian Communities to assure local and regional questions of access are meaningfully examined. The planning process may also include coordination with ADOT and other regional planning agencies (specifically, MAG, CAG, and Sun Corridor Metropolitan Planning Organization – SCMPO) the actions of which may be affected by or potentially impact City plans. Multiple public meetings and interviews will be conducted to obtain input to the planning process from standing City committees, residents, and specific stakeholder organizations.

Activities associated preparing the ATP and TMP have been reviewed weekly by the Project Team created for the study, which has been made up of the City transportation planning staff and the consulting team. The Project Team regularly evaluated study progress and results. A Technical Advisory Group (TAG) also was engaged monthly to provide timely input and guidance as the study progresses. The TAG was made up of staff representing affected City programs and services, the consulting team, and a representative of

MAG. The City maintains a Transportation Advisory Committee (TAC), the membership of which is formed of citizens of the community, to provide a sounding board for proposed City plans and actions. Both the TAG and TAC were instrumental in reviewing the findings and conclusions associated with milestone activities of the study. In addition, the City Council was briefed at key points of the study to assure concurrence and support for the ATP and TMP.

1.4 STUDY GOALS AND OBJECTIVES

This study was undertaken to accomplish four key goals:

- Support the *General Plan* Update process;
- Initiate actions in response to guidance in the *City of Maricopa 2040 Vision Strategic Plan*
- Establish priorities for Transportation Improvement Program (TIP);
    - Provide clear standards to provide guidance for City staff and developers; and
    - Provide input to MAG's "NextGen" RTP. The objectives of this study have been focused on establishing a long-term framework for developing a system of transportation services and facilities to serve the City well into the future, specifically:
    - Update transportation planning framework to be supportive of City development patterns;
- Examine the roadway network to assure functions match community growth and development patterns and needed regional connections; and
- Examine the transportation infrastructure relative to multimodal needs.

2.0 VISION & GOALS

2.1 CITY OF MARICOPA 2040 VISION STRATEGIC PLAN

The City of Maricopa recently completed a visioning exercise, the *City of Maricopa 2040 Vision Strategic Plan*, that identified a series of goals to guide the ongoing update of their 2006 *General Plan*. This TMP adheres to the stated goals and objectives related to the Transportation Vision, as presented in *City of Maricopa 2040 Vision Strategic Plan*:

> *The City has an integrated, citywide, regional, and multimodal transportation system that is safe, functional and integrated with the Smart Cities Initiative.*

2.2 TRANSPORTATION GOALS

TRANSPORTATION GOAL 1	STRATEGIES
Goal: Provide greater, more efficient mobility through multi-modal transportation to and from Maricopa. **Rationale:** Improved mobility opportunities foster greater economic development through a more efficient and economical workforce for both itself and its neighbors through mass transit.	**1A:** Explore greater connectivity with the Phoenix metro area with the expansion of one or more express bus routes to Maricopa. **1B:** Expand Park and Ride opportunities within the City **1C:** Expand the current use of buses, shuttles, or even a trolley within the City to key locations and population centers. **1D:** Explore addition of high-speed trains, light rail, and other modes for connecting to the Phoenix Metro area. **1E:** Create a mobility corridor to and through the downtown area for future light rail connection to Phoenix. **1F:** Foster strategic regional transportation partnerships (AMTRAK, Gila River Indian Community, Pinal County, etc.), including joining Valley Metro RPTA and Sun Corridor MPO. **1G:** Explore the potential benefits, financial viability and realistic means necessary to establish a partnership and/or operate a regional airport within the Maricopa planning area.

TRANSPORTATION GOAL 2	STRATEGIES
Goal: Create an adequate intra-city road network. **Rationale:** As outer regions of the City develop, an adequate road network is necessary to relieve future congestion and foster future growth.	**2A:** Complete the City Regional Transportation Master Plan and fully implement on arterial roadways. **2B:** Establish truck routes through the City and near adjacent farms. **2C:** Complete the SR 347 at UPRR Grade Separation/ Overpass. **2D:** Accept control of all roadways within Maricopa currently under the jurisdiction of other agencies (SR 347, SR 238, etc.).

TRANSPORTATION GOAL 2 (Continued)	STRATEGIES
	2E: Foster strategic partnerships with immediate neighbors (Ak-Chin Indian Community, Gila River Indian Community, Casa Grande, etc.). **2F:** Integrate monitoring and traffic flow control infrastructure to all signalized arterial intersections.

TRANSPORTATION GOAL 3	STRATEGIES
Goal: Create transportation connectivity with other cities and regions. **Rationale:** As outer regions of the City develop, an adequate road network is necessary to relieve future congestion and foster future growth.	**3A:** Explore additional north/south travel routes in addition to SR 347. **3B:** Plan and build high capacity east/west regional travel routes. **3C:** Foster strategic regional partnerships beyond Pinal County.

TRANSPORTATION GOAL 4	STRATEGIES
Goal: Create safe and functional pedestrian ways and bicycle routes throughout the City of Maricopa. **Rationale:** Movement within the City fosters individual health of citizens, builds community, relieves congestion, and increases local economic activities.	**4A:** Develop bike lanes on all possible arterial roadways and reasonable connections reaching all shopping and population centers within the City. **4B:** Establish and maintain a citywide trails and pedestrian plan. **4C:** Increase handicapped accessibility. **4D:** Develop pedestrian trails and bikeways connecting all parks, greenways, and commercial areas within the City.

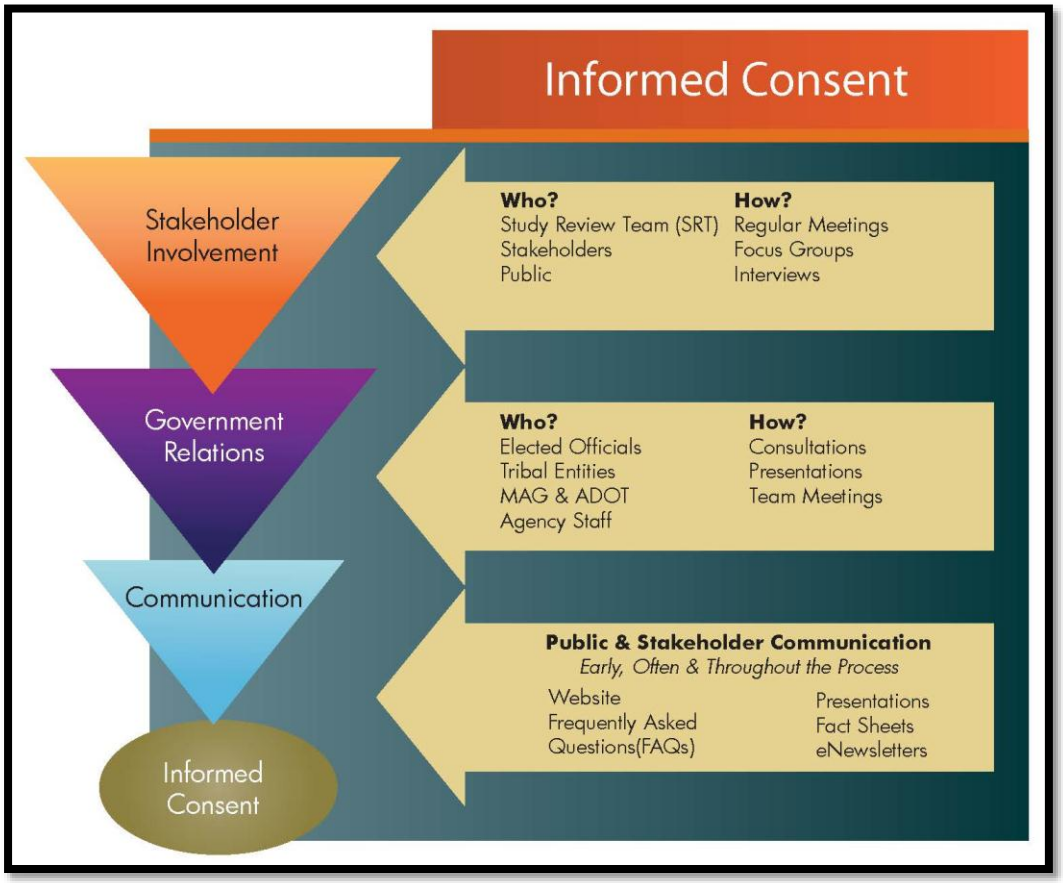
3.0 STAKEHOLDER AND PUBLIC OUTREACH

The objectives of the public outreach effort were threefold: to educate and inform the public about the various elements of the planning project, acquire meaningful feedback and input to steer the direction of the planning process, and inform the public about how their input is reflected in the final product. To achieve these objectives, the study team employed a number of public involvement strategies. These strategies are documented in the following section. Details related to the public and stakeholder outreach are documented in the appendices.

3.1 PUBLIC INVOLVEMENT STRATEGIES & METHODS

The main goal of the public outreach effort was to achieve informed consent, illustrated in Figure 3-1. In support of this goal, the study team employed a number of strategies throughout the course of the project to involve stakeholders, coordinate with other government agencies, and communicate with the public. The public outreach effort included: seven Transportation Advisory Committee meetings, four TAG meetings, two Planning and Zoning Committee meetings, four Public Open Houses, five City Council Work Sessions, and two Developer Outreach Forums, as well as more than fifteen meetings with individual stakeholders (ADOT, MAG, Ak-Chin Indian Community, Casa Grande, SCMPO, and developers). Detailed information for each of these efforts/strategies are documented below.

Figure 3-1 | Informed Consent



3.2 PUBLIC INVOLVEMENT COMPONENTS

TRANSPORTATION ADVISORY COMMITTEE MEETINGS

Over the course of the planning process, the study team met with a group of City of Maricopa stakeholders, the Transportation Advisory Committee, to review planning efforts, seek input, and receive guidance. The dates and topics of each of the five TAC meetings are listed below:

- January 28, 2015: Introductions, study background, study purpose, goals, objectives, and project schedule
- February 24, 2015: Ak-Chin and Gila River Indian Community outreach, travel demand modeling horizons, and study schedule
- March 31, 2015: Socioeconomic forecasts, results of the 2040 base conditions model run (specifically projected roadway deficiencies and potential roadway improvement alternatives), public input from the March 17th Public Open House and City Council Work Session
- April 28, 2015: Phasing of recommended roadway project implementation, Complete Streets, development of the preliminary Buildout network, and feedback from the Developer Outreach Forum and Public Open House held earlier in the day
- June 1, 2015: SR 347 Corridor Operations Assessment, TMP elements, Intelligent Transportation Systems (ITS) planning, and feedback from coordination meetings with ADOT and MAG
- July 22, 2015: Presentation of Draft TMP and Regional Connectivity Plan (RCP) recommendations
- October 19, 2015: Final ATP presentation and recommendation

PLANNING AND ZONING COMMITTEE MEETINGS

The study team also met with the Planning and Zoning Committee on August 10, 2015 and November 23, 2015 to provide an overview of the TMP and RCP process and recommendations.

TECHNICAL ADVISORY GROUP MEETINGS

The TAG was composed of City of Maricopa staff as well as representatives from adjacent agencies and other key stakeholders. Agencies represented in this group consist of: MAG, Pinal County, Maricopa County, City of Goodyear, City of Casa Grande, SCMPO, Gila River Indian Community, CAG, Town of Buckeye, ADOT, Arizona State Land Department, UPRR, and Tohono O'odham Indian Community.

- The role of each of the TAG members was to provide input into the process, review deliverables, and ensure their agency was kept informed about the project. To achieve this, members of the TAG met on three occasions. The dates and subjects of these meetings are documented below. March 5, 2015: Study background, study purpose, goals, objectives, study schedule, and socioeconomic projections
- April 16, 2015: Further examination of growth projections, Year 2040 roadway deficiencies and potential roadway improvement alternatives, phasing of recommended roadway project implementation, and review of public outreach efforts
- May 13, 2015: Programming of improvement projects, Complete Streets, preliminary Buildout network, SR 347 corridor assessment, and discussion of ongoing public outreach efforts.
- July 14, 2015: Presentation of Draft TMP and RCP recommendations.

PUBLIC OPEN HOUSES

Throughout the development of the plan, the project team conducted two public open houses to engage the public and receive feedback for the planning process. The topics presented at the first open house, held on March 17, 2015, included a study overview (e.g. study area, goals, objectives, etc.), Year 2040 and Buildout socioeconomic forecasts, and existing and future Year 2040 roadway network performance. The second round of public open houses, on April 28, 2015, and May 5, 2015, covered Complete Streets, roadway network deficiencies, and the phasing of recommended roadway project implementation. The final open house presented the TMP and RCP recommendations on August 4, 2015..

COUNCIL WORK SESSIONS

Throughout the development of this plan, the study team participated in numerous work sessions with the City Council. At these work sessions, the study team presented updates on the status and key findings of the study and received direction from the City Council for next steps. The five city council work sessions were held on:

- January 22, 2015
- March 17, 2015
- May 5, 2015
- June 16, 2015
- August 4, 2015

DEVELOPER OUTREACH FORUMS

Members of the development community were invited to attend outreach forums on April 28, 2015, and July 22, 2015. The first forum included a presentation that gave an overview of the study, provided an update on the study progress, presented the initial findings of the roadway deficiency analysis, and discussed the Complete Streets element of the plan. The second forum included a presentation of the draft TMP and RCP recommendations. These forums provided developers a venue to provide feedback and express concerns, which informed the development of the plan.

MULTI-JURISDICTIONAL COORDINATION

As part of the stakeholder and public outreach, the project team met with representatives from a number government agencies to provide project background, discuss key findings, and solicit feedback on the study process. These agencies include: MAG, ADOT, Ak-Chin Indian Community, Pinal County, City of Casa Grande, and SCMPO.

4.0 KEY AREA & REGIONAL PLANS

The Study Area transportation system has been studied numerous times in the past, either as the direct focus of a local, City-oriented study or as a component of a larger, regional study. The results of these actions have contributed to the development of the system in place today and programmed or planned for implementation in the future. Findings and conclusions of these studies, therefore, are relevant to the development of the ATP, RCP, and TMP. The challenge in this planning process is to ensure the current assessment is consistent with past studies and that any differences in the basis of analysis, parameters of decisions, or recommended actions are understood and defined. Justifications for modification to previous recommendations must be adequately documented to ensure an appropriate basis for discussion.

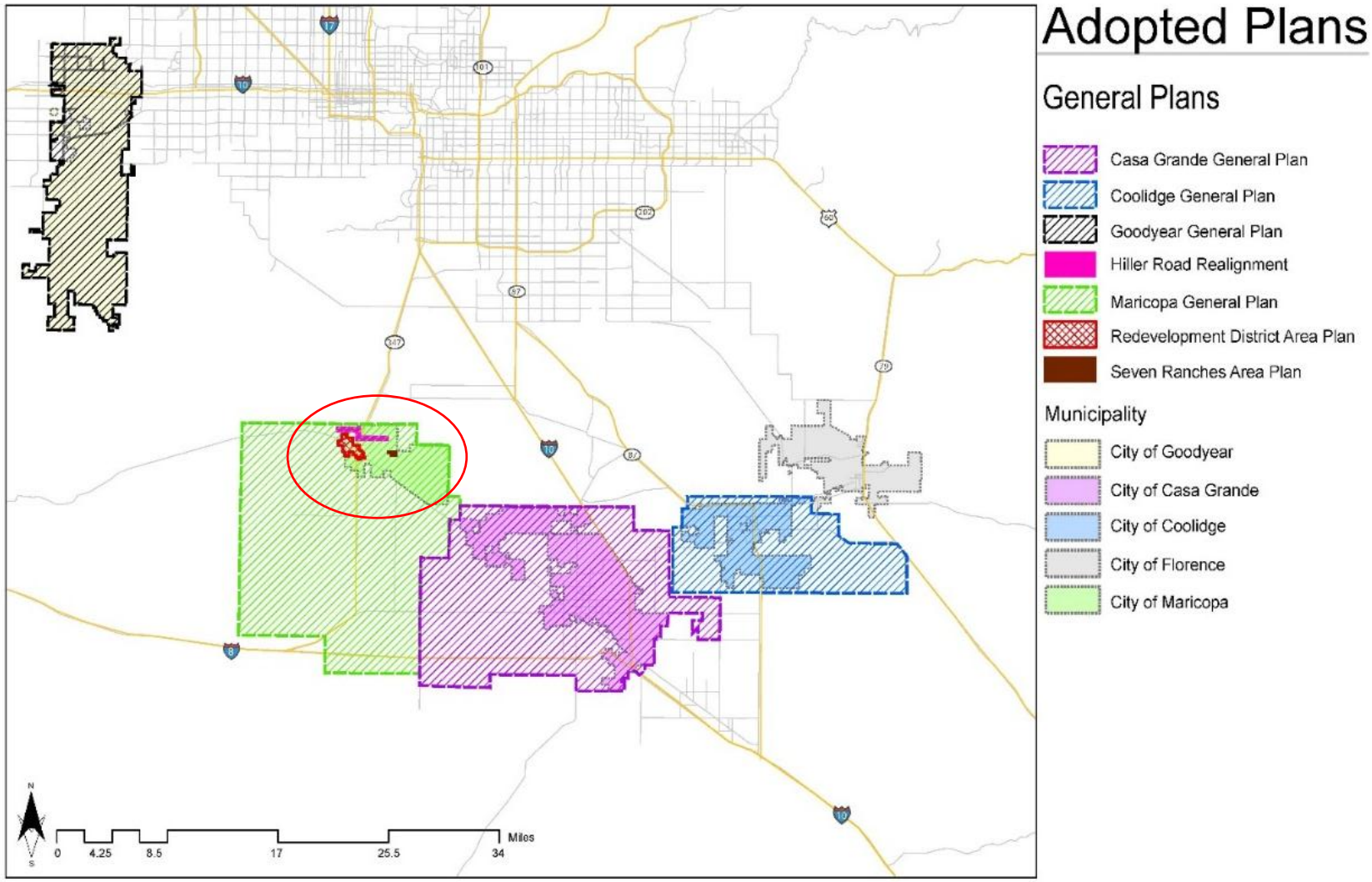
This chapter provides a focused assessment of previous and ongoing plans and studies, homing in on the aspects of those studies that most influence the future of transportation in the Study Area and connectivity with the greater Pinal/Maricopa County region. Summaries of the key facets of these plans and studies relevant to the Study Area are presented in Appendix A. The summaries are divided into four categories: City of Maricopa Studies, Regional Planning Studies, ADOT Studies, and Traffic Impact Studies.

4.1 RELEVANT GENERAL AND SPECIFIC PLANS

The findings, conclusions, and recommendations of particularly relevant to development of the ATP and the assessment of regional connectivity are the General Plans of Maricopa, Casa Grande, Coolidge, and Goodyear. Figure 4-1 shows the areas covered by these General Plans and three other areas of special interest: *Hiller Road Realignment Study*, *Heritage District Area Plan*, and *Seven Ranches Area Plan*. These plans are immediately relevant to analysis and assessment of the major roadway system in the City and formulation of the long-range TMP.

- *Hiller Road Realignment Study*: This study was undertaken to determine the financial, environmental and cultural feasibility of constructing Hiller Road on an alignment along the most northern boundary of the City.
- *Heritage District Area Plan*: This plan recognizes the importance of Maricopa's historical center for commerce, transportation, housing, recreation, and education, the city's leaders, residents, and businesses. It presents the vision of the community to focus public resources on redevelopment of the area and provides a framework for policies and actions, both public and private, to guide appropriate investments as growth occurs.
- *Seven Ranches Area Plan*: This study represents the results of an independent, professional, 3rd party investigation of the Seven Ranches area. It provided a basis for coordinating with the City key infrastructure improvements to alleviate current constraints. The four-member American Planning Association Community Planning Assistance Team (CPAT) worked with Maricopa staff in February 2012, helping the City address infrastructure and design challenges in the Seven Ranches area. During its working visit, the team toured Seven Ranches area and met with a variety of local leaders and residents. The team issued a report defining a vision for the area and offered several recommendations in support of the City's cooperative, collaborative, and comprehensive planning process, regarding drainage and circulation. The study gave particular emphasis to addressing the fragmented parcelization of the area.

Figure 4-1 | Boundaries of Relevant General and Specific Area Plans



In addition, Saddleback Farms is a small area at the eastern edge of the City that also may influence the roadway network, particularly as is relates to the transition between the City of Maricopa and the City of Casa Grande. This is a rural subdivision in Pinal County with the Gila River Indian Community abutting it on the north and east, the City of Maricopa on the west, and Ak-Chin Regional Airport on the south. Peters & Nall Road provides the only access to the subdivision. Therefore, questions of future access, as Maricopa grows, are important for this current planning effort.

4.2 RELEVANT PLANS RELATING TO PARKS, TRAILS, BICYCLING, AND ECONOMIC DEVELOPMENT

The most critical of this category of plans for the Maricopa MPA are *Growing Maricopa, an Economic Development Strategic Plan* (2011) prepared by the City in cooperation with Maricopa Economic Development Alliance and the *Regional Trails Master Plan* (2005) of neighboring Casa Grande. Long-term planning also must coordinated with the *Pinal County Open Space & Trails Plan*, *Goodyear Parks and Recreation Plan*, and the *MAG Regional Bikeway Master Plan* (2007) and Regional Bike Map (2013). The issue of regional connectivity is addressed later in Chapter 9, Trails and Pathways Element. The boundaries of areas encompassed by these plans are shown in Figure 4-2.

4.3 MAJOR REGIONAL PLANNING STUDIES

The *I-8 and I-10 Hidden Valley Transportation Framework Study (Hidden Valley Framework Study)* prepared by MAG through a collaborative effort of local jurisdictions and ADOT, establishes a plan for future major routes to serve western Pinal County and southwestern Maricopa County. Preparation of "Framework" plans has provided local jurisdictions, such as Pinal County, the City of Maricopa, and the City of Casa Grande, with guidance for establishing future alignments of major roadways needed to serve future growth. The Pinal County SATS and *Regionally Significant Routes for Safety and Mobility* (RSRSM) *Plan* by Pinal County also are important planning studies that have identified future routes, especially important to regional connectivity.

These studies have created important guidance relating to extensions of east-west arterials and potential development of the proposed Interstate 11 (I-11) freeway through the central portion of the Maricopa MPA. Each also provides guidance to local jurisdictions regarding the need to preserve right-of-way for these major roadway facilities, protecting it from encroachment by future growth. Right-of-way preservation actions, based on additional concept planning and refined definition of the alignments, will reduce the development cost of major roadways. Figure 4-3 shows the geographic extent of these and other important studies affecting the future roadway network of the MPA and the greater Central Arizona region.

4.4 RELEVANT AREA TRANSPORTATION STUDIES

The aforementioned SATS and RSRSM prepared for Pinal County helped lay the groundwork for later studies important to the community of Maricopa, including the *Pinal County East-West Corridor Study* (underway) and Design Concept Report (DCR) and Environmental Assessment (EA) recently completed for a project to grade separate SR 347 from the UPRR tracks. The *Maricopa Infrastructure Improvement Plan* also provides an important reference for identifying and evaluating future roads and streets of the MPA for inclusion in the ATP and TMP (refer to Figure 4-4).

Figure 4-2 | Boundaries of Relevant Plans Relating to Parks, Trails, Bicycling, and Economic Development

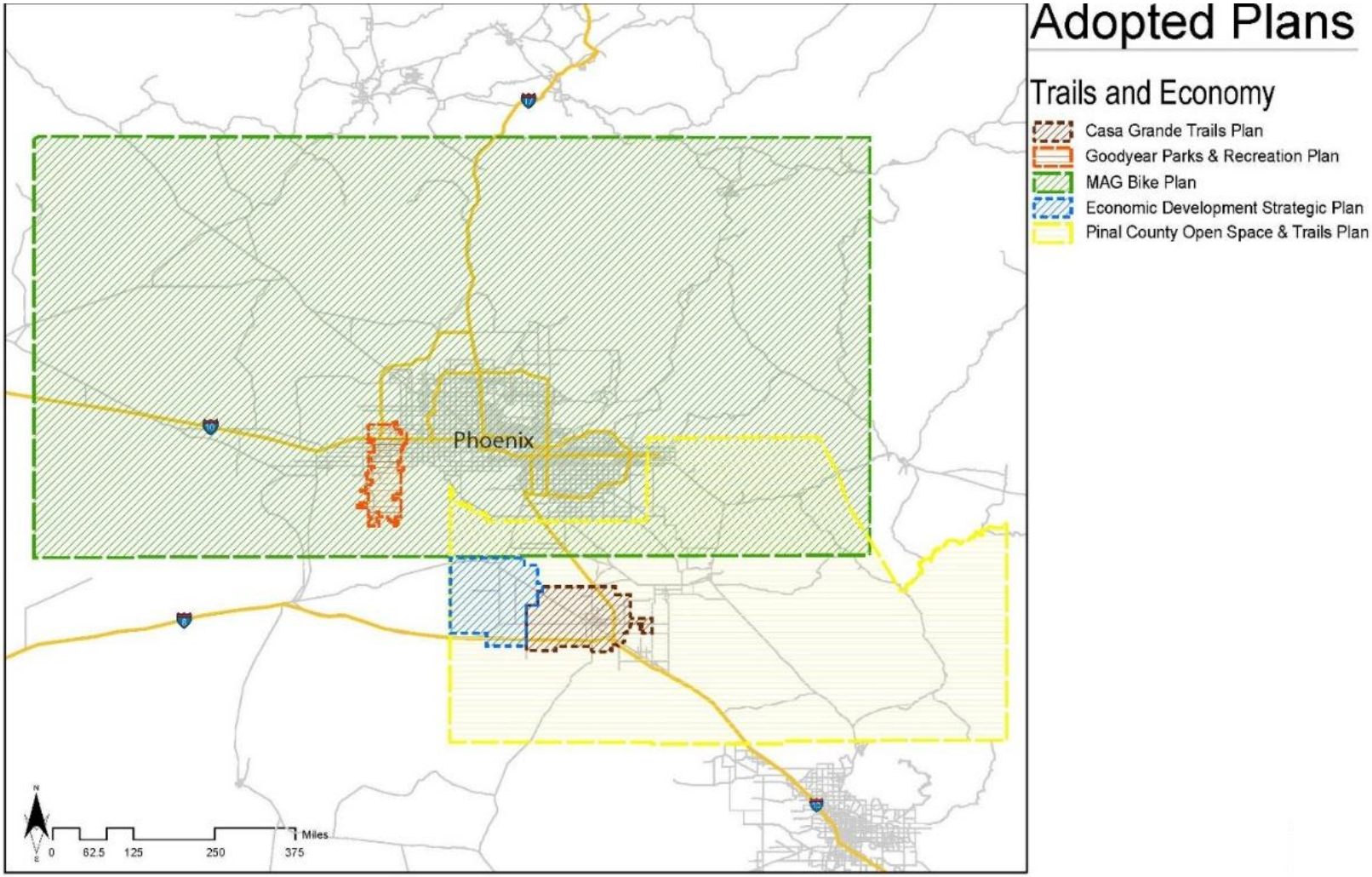


Figure 4-3 | Geographic Extents of Major Regional Planning Studies

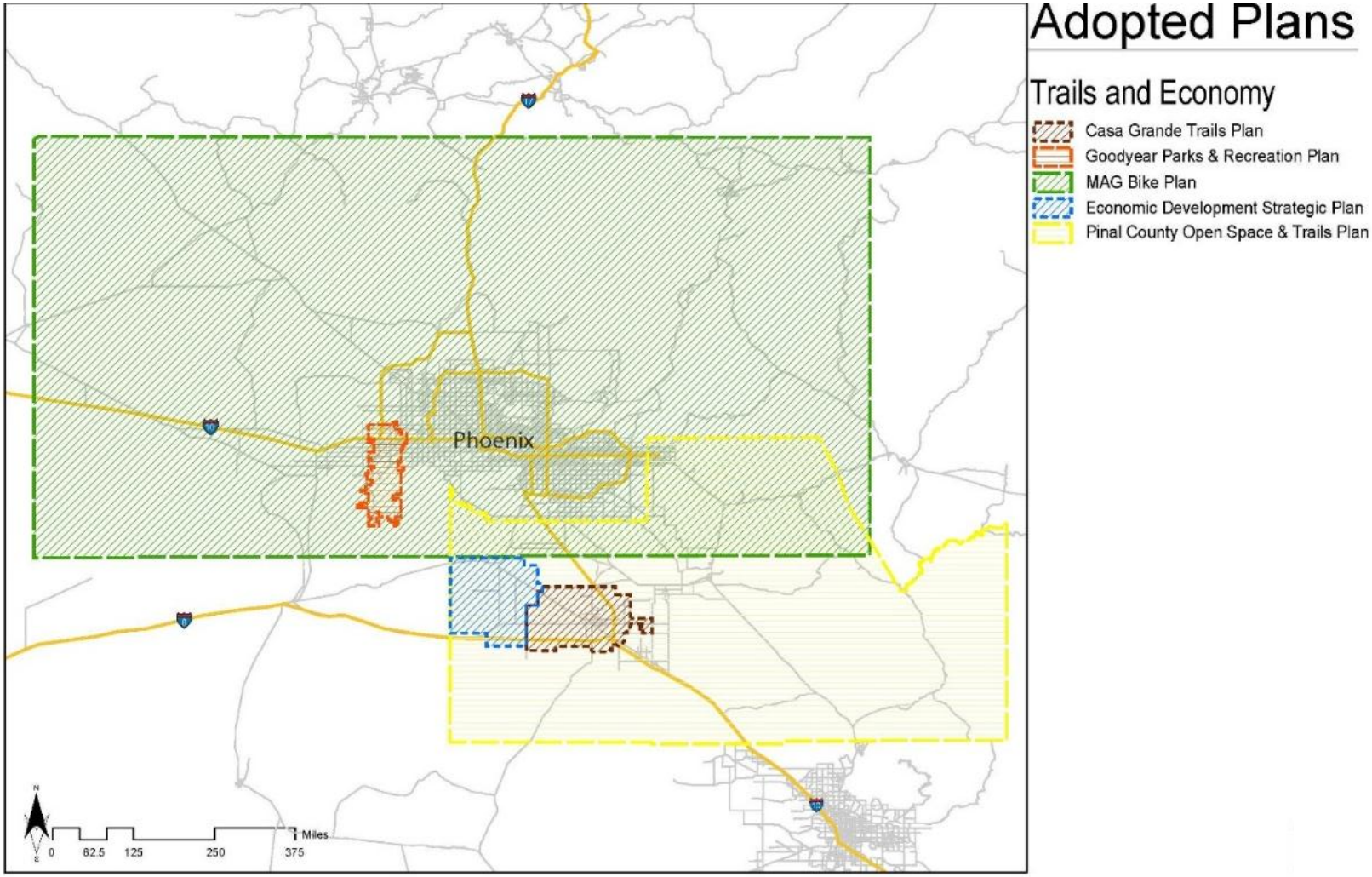
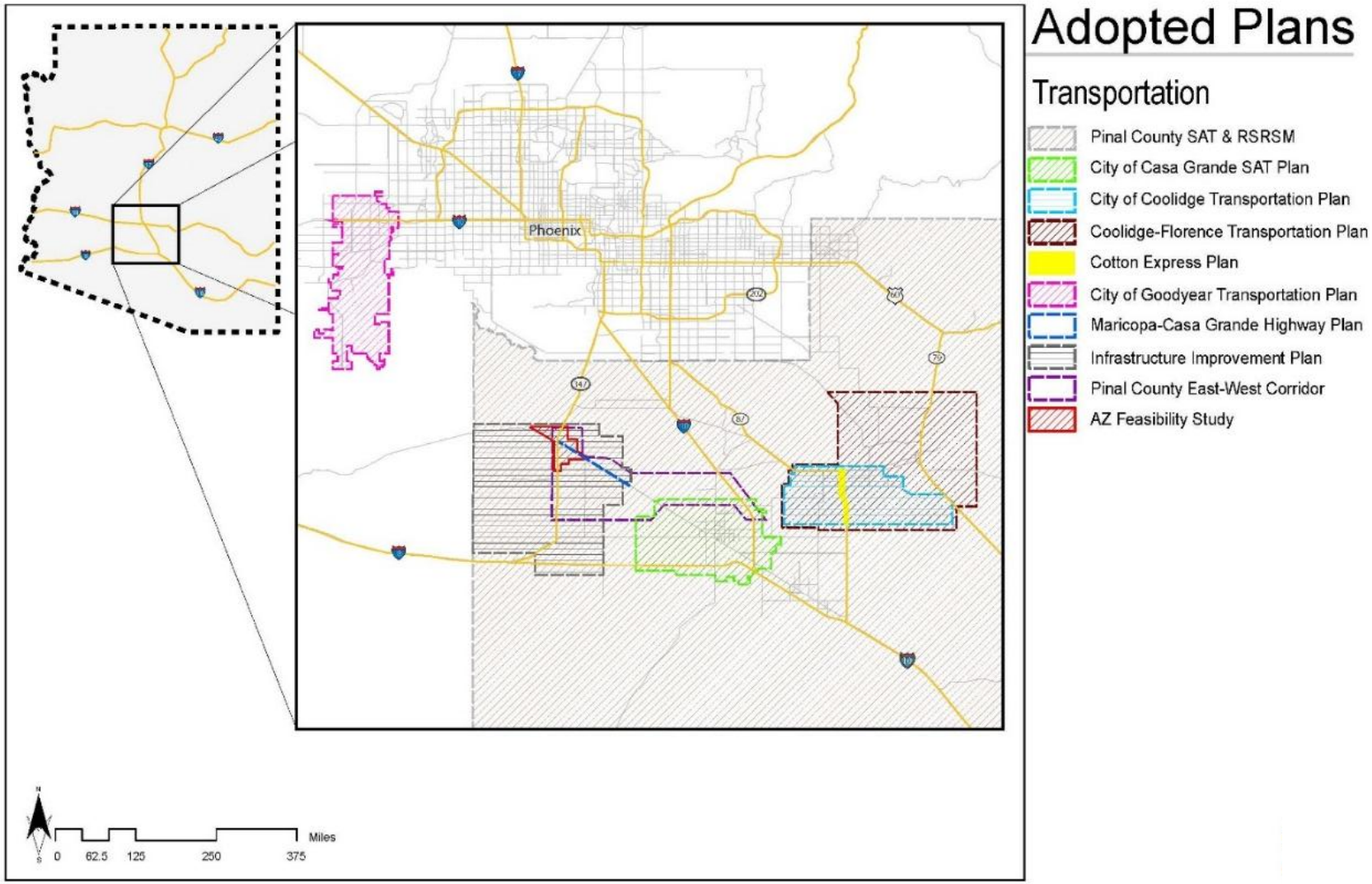


Figure 4-4 | Boundaries of Relevant Area Transportation Studies



5.0 EXISTING CONDITIONS

The significant population expansion of the City of Maricopa in the past two decades was not complemented by a proportionate increase in employment opportunities. Commercial and retail outlets, services, and social institutions also could not keep pace. As a result, there is high degree of economic, as well as social, interaction with the Phoenix metropolitan area to the north and Casa Grande to the southeast which relies on the local and regional transportation system. This section of the TMP presents information describing current conditions in the Study Area with respect to the existing transportation infrastructure, socioeconomic (i.e., population and employment) characteristics, relevant previous planning efforts, and funding of planned and committed projects.

5.1 ROADWAY NETWORK

Although the City still is a relatively small urban community removed from larger growth areas, it is served by two state highways. The original town site follows a northwest-southeast orientation paralleling the UPRR corridor. The two state highways and a grid of section line roads carry the majority of trips, as the roadway network is the primary means of travel. The roadway network serving Maricopa is and will continue to be influenced by the presence of substantial physical constraints or barriers, such as major drainage features, the UPRR, Native American communities, and mountain ranges along the western edge of the Study Area. This section presents a description of key attributes of the Study Area roadway network. The first part addresses overall network operational characteristics; the second part identifies programmed roadway improvements; and the third part provides an inventory of major roadways serving the community.

NETWORK OPERATIONAL CHARACTERISTICS

Information regarding five key aspects of the City's roadway network is presented in this section: Jurisdictional Responsibility, Functional Classification, Roadway Design/Configuration, Surface Type, and Traffic Control.

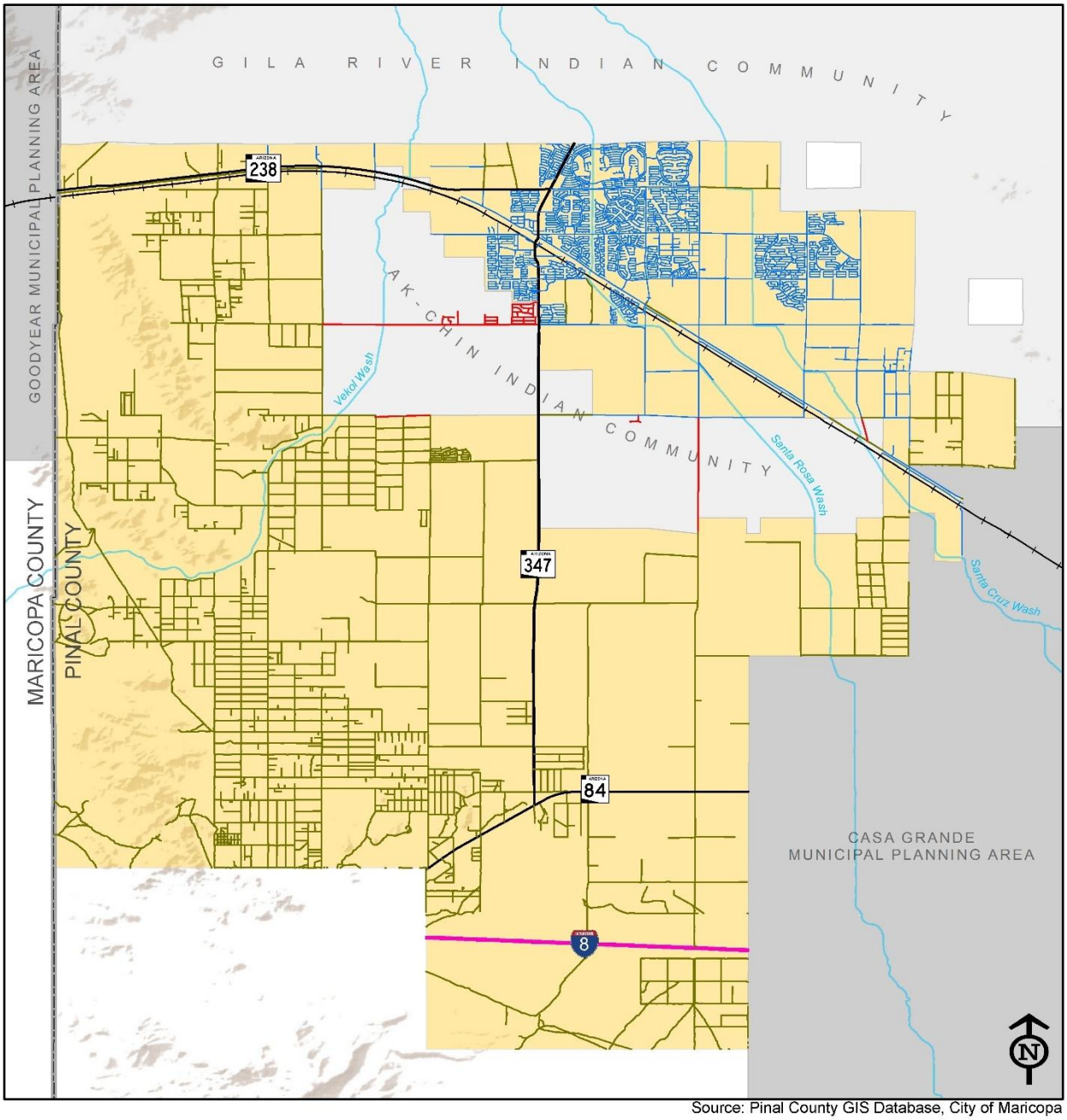
JURISDICTIONAL RESPONSIBILITY

The State of Arizona through ADOT is responsible for all routes on the State Highway System (SHS) in the Study Area. The responsibility of the City of Maricopa extends to all non-state routes within the City Limits. Pinal County administers all roadways in the unincorporated portions of the Study Area. Roadways within the Ak-Chin Indian Community are constructed and maintained by the Bureau of Indian Affairs (BIA), Pinal County, or the Ak-Chin Indian Community with some exceptions. Figure 5-1 identifies jurisdictional responsibility for Study Area roads, excluding local roads within the Ak-Chin Indian Community. The State maintains SR 347 and the City of Maricopa maintains the MCGH within its municipal boundary.

FUNCTIONAL CLASSIFICATION

Roadways serve two critical functions: the highest function affords mobility (movement from place to place); the more local function affords access (ingress and egress to adjacent land). Due to traffic flow friction created at access points, high mobility often comes at the expense of access and vice versa. Roads with more frequent access points have lower mobility and roads with greater mobility require less frequent access points. The general framework of the functional classification system categorizes roads by how they

Figure 5-1 | Jurisdictional Responsibility



Source: Pinal County GIS Database, City of Maricopa

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area

Responsible Jurisdiction

- City of Maricopa
- Ak-Chin Indian Community
- Pinal County
- State of Arizona
- US Government

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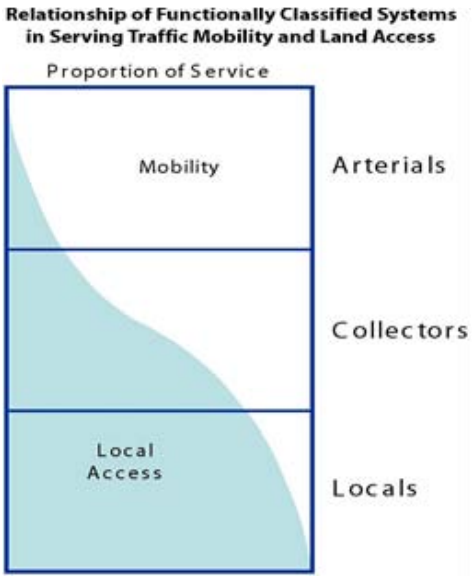
perform in regard to providing access and mobility. This relationship is graphically depicted at right. An arterial, facility for example, provides mobility for longer distance trips with high speeds and minimal access to adjoining properties. Conversely, the function of local streets is to provide direct access at lower speeds to neighborhood areas.



This concept of access vs. mobility is the main criteria used to establish the functional classification of roadways. Roadways that prioritize mobility, with higher speeds and less frequent access points, are classified at the higher end of the functional classification spectrum (e.g., Interstate, Principal Arterial). Roads that prioritize access, with lower speeds and frequent ingress and egress points are classified at the lower end of the spectrum (e.g., Local Streets). The following functional classification categories are defined in the Federal Highway Administration (FHWA) *Highway Functional Classification Concepts, Criteria and Procedure*,[1] in order from highest mobility prioritization to highest access prioritization:

- Interstates
- Other Freeways & Expressways
- Other Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors
- Local Roads

The concept of functional classification is discussed in more detail in the *Major Roadways* section, where the functional classification of each major roadways in the Maricopa MPA is identified.

ROADWAY DESIGN/CONFIGURATION

Most roadways in the Study Area are two-lane facilities. Typically, two-lane roadways have two through lanes – one in each direction, and some have a continuous center left-turn lane. Some two lane roadways also have flared intersections to facilitate left or right turns. Four-lane roadways are comprised of two through lanes in each direction; SR 347/John Wayne Parkway is an example of a four-lane roadway comprised of two through lanes in each direction. In addition, short segments of SR 347/John Wayne Parkway have six lanes (between Smith-Enke Road and Edison Road) and five lanes – three southbound and two northbound (north of Smith-Enke Road to Lakeview Drive and south of Smith-Enke Road to Edison Road). Portions of these roadways have medians or a continuous center left-turn lane. Additional detail regarding these facilities is presented in the Major Roadways section.

[1] USDOT FHWA, *Highway Functional Classification: Concepts, Criteria, and Procedures*, 2013 Edition, http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/fcauab.pdf

SURFACE TYPE

In developed or urbanized portions of the Study Area, all collector-level and above streets are paved. In rural portions of the Study Area, some arterial roadways are paved. A large portion of the Study Area does not have an established roadway network at this time. There are numerous dirt roadways serving residents living in the western and southern portion of the Study Area. In some cases a roadway alignment exists but is not dedicated; the path is considered to be a mere trail. Roadway surface types for major roads and streets in the Study Area are shown in Figure 5-2.

TRAFFIC CONTROL

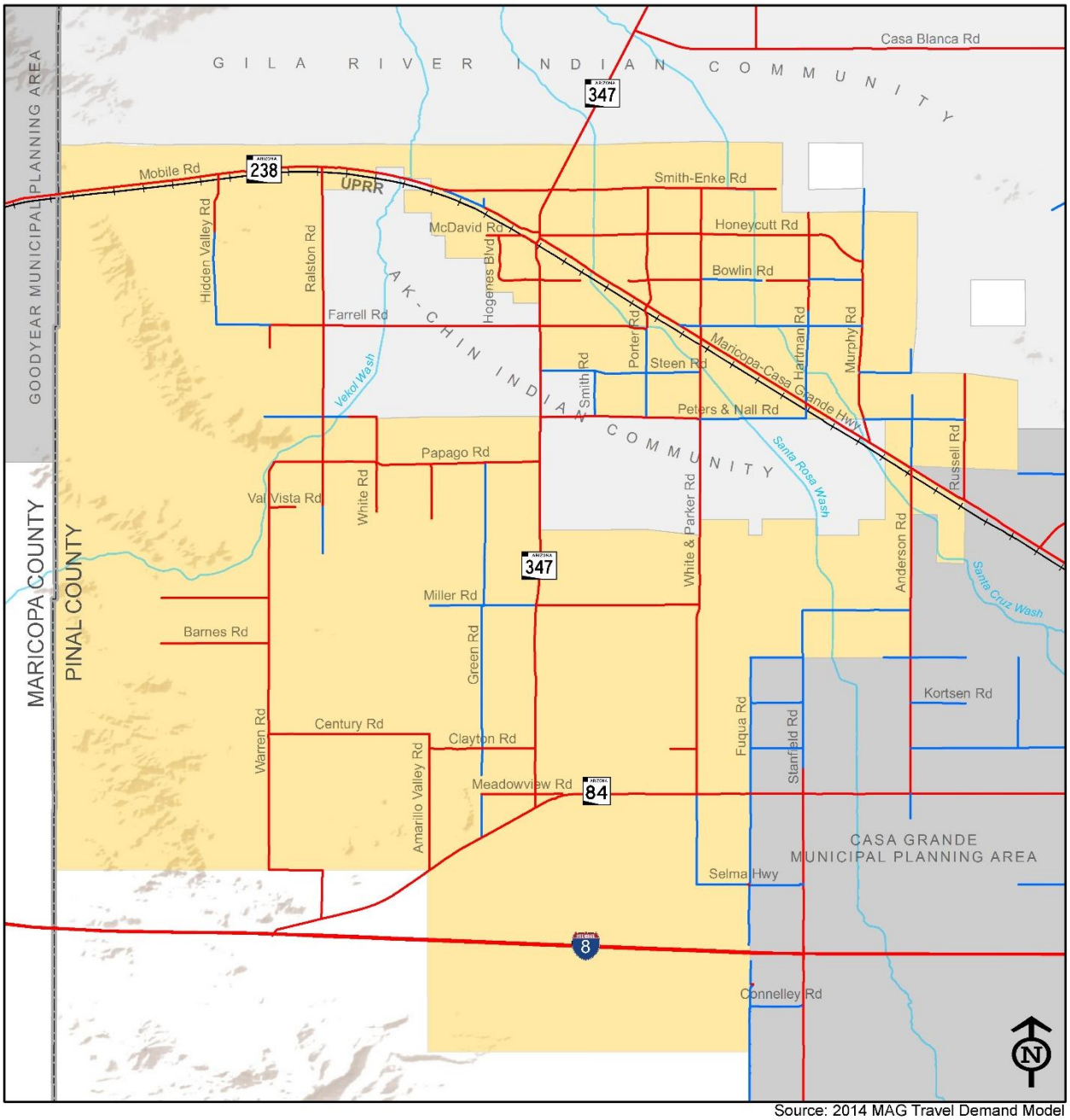
Traffic operations on the roadway network are influenced by posted speed limits, geometric design, signalization, and signage. Rural portions of state arterial routes in the Study Area generally are posted at 55 miles per hour (mph). Urban segments of these roadways have posted speeds ranging from 25 mph to 45 mph. Speed limits on collector and local streets range from 25 mph to 40 mph. County roads in the Study Area are posted at 50 mph, except in more heavily developed areas, where the posted speed may be reduced to less than 40 mph. The Study Area includes 27 signalized intersections, the majority of which are concentrated along SR 347. The City of Maricopa maintains 16 of the traffic control signals: one is located at the intersection of Smith-Enke Road with SR 347; four are located along MCGH southeast of SR 347; and six are located along Porter Road. Five other signalized intersections exist: two on Smith-Enke Road at the intersections of Santa Cruz Drive and Santa Rosa Drive/Province Parkway; two on Honeycutt Road at the intersections of Maricopa Groves Parkway and Province Parkway/Glennwilde Drive, and one on Bowlin Road at the intersection of Smith Farms Circle/Regent Drive. Figure 5-3 illustrates the location of signalized intersections within the Study Area.

DRAINAGE STRUCTURES

According to data from the National Bridge Inventory, there are 55 major drainage structures (i.e., bridges and major culverts) in the Study Area that connect roadways across various physical barriers like canals, washes, and roads. In fact, there are ten bridges at eight locations in the Study Area; four bridges are directional, supporting travel in divided traffic lanes. These structures facilitate travel over Santa Rosa Wash at three locations, Santa Rosa Canal at two locations, Santa Cruz Wash at two locations, Vekol Wash at two locations, and Smith Road under Interstate 8 (I-8). The 45 major culverts, as expected, are mostly concentrated where hydrologic features intersect Study Area roadways. Figure 5-4 illustrates the location of drainage features in the Study Area.

The Federal Emergency Management Agency (FEMA) recently completed a multi-year study to update Flood Insurance Rate Maps (FIRMs) for the City. The new flood hazard maps became effective June 16, 2014. Up-to-date FIRMs more accurately represent the risk of flooding and provide residents and business owners with the most current, reliable data about potential flood hazards. Many property owners will note the flood risks to their property is higher, which may result in flood insurance being required if a mortgage has been taken out on the property. Other property owners may note that their flood risk has reduced. In addition, changes in the delineation of potential flood zones could result in changes in building requirements. New or substantially improved building in delineated flood zone on FIRMS may be required to adhere to stricter building safety and security requirements.

Figure 5-2 | Roadway Surface Type



Source: 2014 MAG Travel Demand Model

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area

Roadway Surface Type

- Paved
- Unpaved

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Figure 5-3 | Location of Signalized Intersections

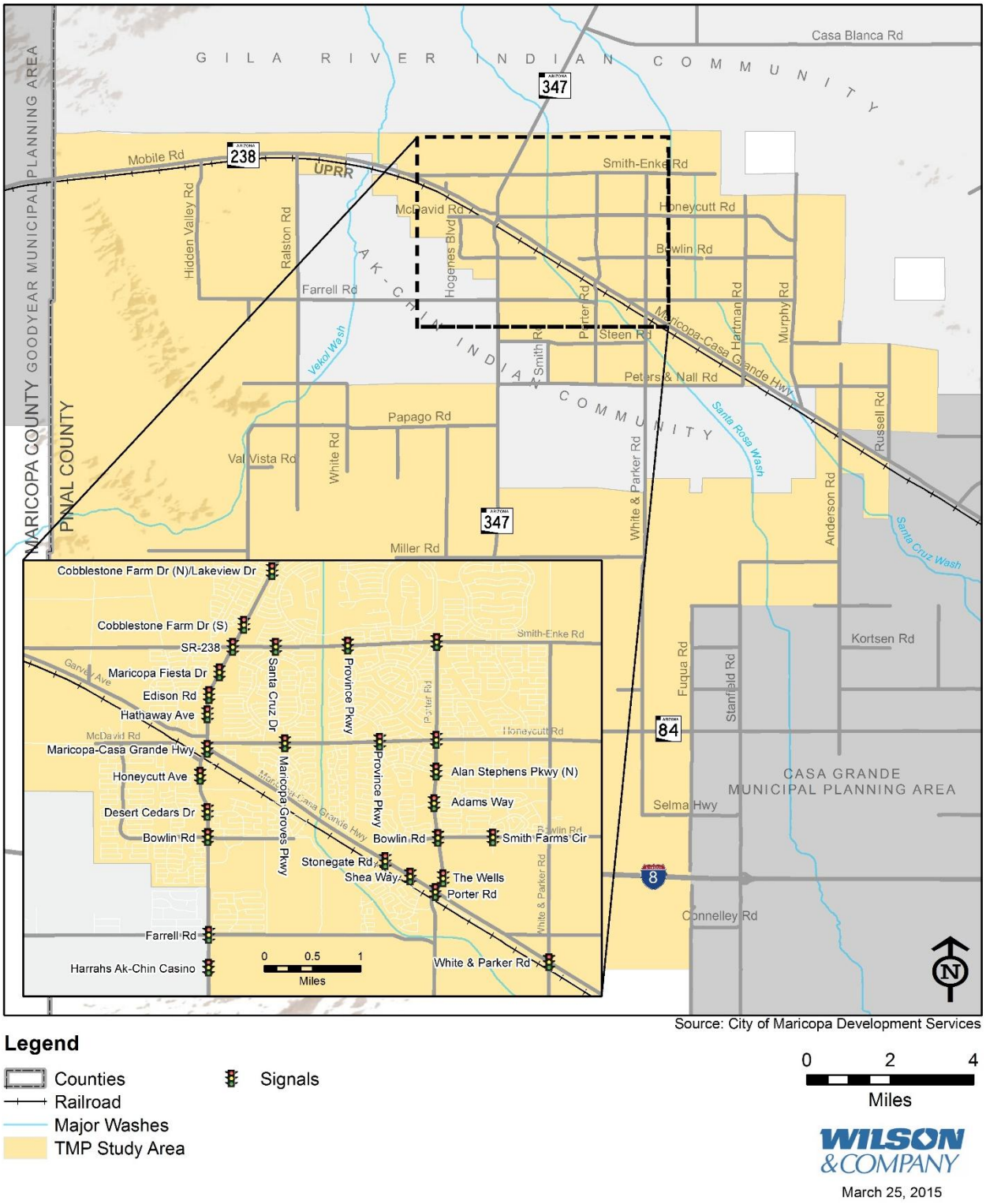
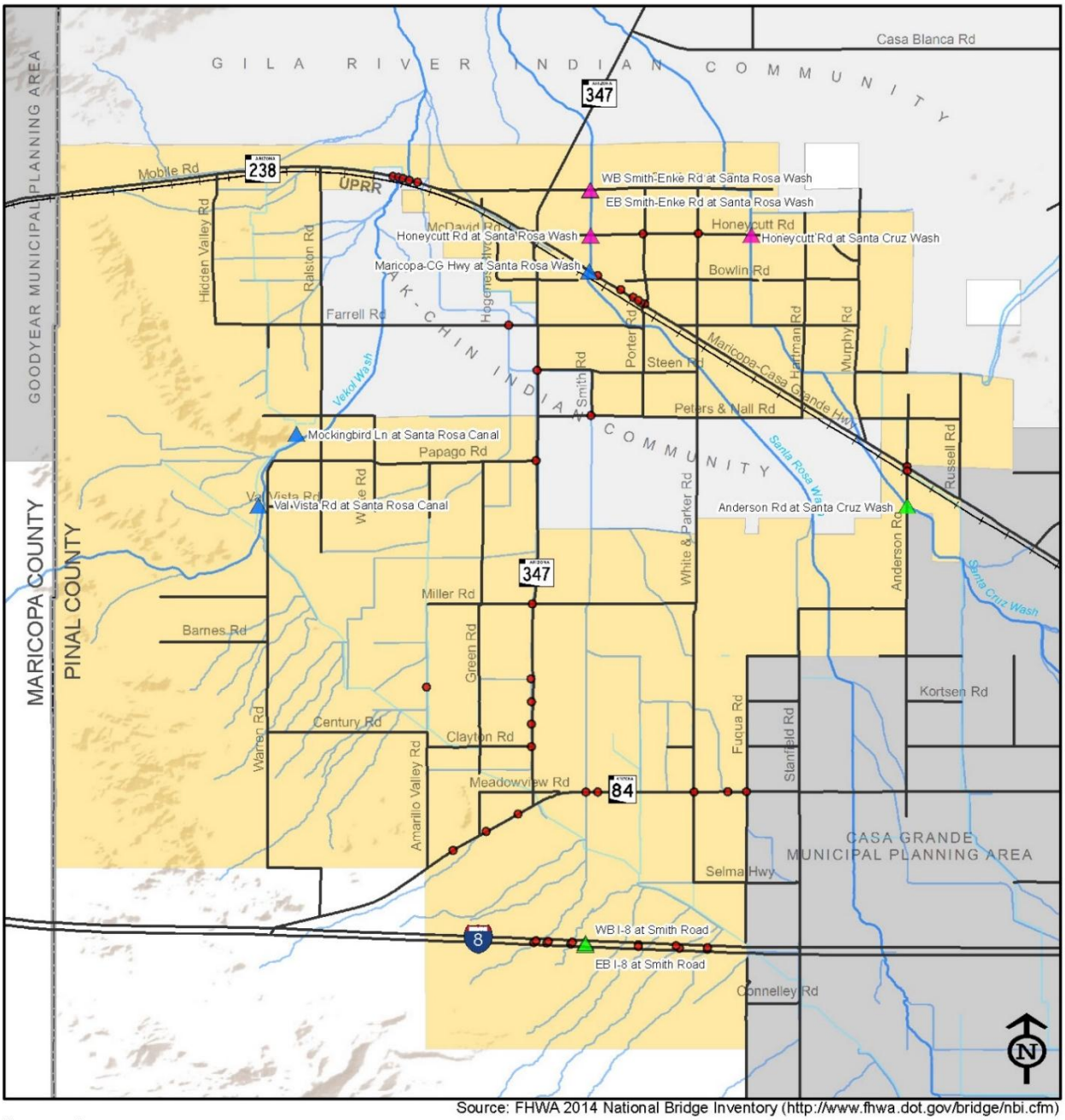


Figure 5-4 | Location of Drainage Structures



Source: FHWA 2014 National Bridge Inventory (http://www.fhwa.dot.gov/bridge/nbi.cfm)

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area
- Slab Bridge
- Stringer/Mulit-Beam or Girder Bridge
- Box Beam or Girder - Multiple
- Major Culvert
- Hydrological Routes
- Canal

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March 25, 2015

EXISTING PLUS COMMITTED ROADWAY NETWORK

As part of the transportation planning and programming process, state DOTs, MPOs, cities, and other governmental entities identify transportation projects in improvement programs that are to be funded over a five-year period. The most recent versions of the ADOT, MAG, and City of Maricopa improvement programs were reviewed to identify programmed roadway construction projects, i.e., projects funded and scheduled for implementation. A complete listing of projects currently contained in these improvement programs is provided in Appendix B. The complete listing of projects were reviewed with City staff to identify those projects that should be assumed to be constructed as part of the Existing-plus-Committed (E+C) Roadway Network. The E+C Roadway Network is also referred to as the Future Base Roadway Network for the Year 2040. That is to say, this would be the roadway network of the future should no other improvements be programmed and funded.

Table 5-1 identifies roadway projects that were incorporated into the E+C Roadway Network and provides key information, including: length, number of lanes before and after improvement, implementation year, and cost.

Table 5-1 | Programmed Roadway Improvements

#	Project	Segment	Miles	Lanes Before	Lanes After	Work Year	Total Cost ($)
1	**SR 347 Overpass Project**	SR 347 Overpass at UPRR	1.0	4	6	2016	54,900,000
		Ramp from SR 347 to Maricopa-Casa Grande Hwy (MCGH)	0.55	0	1		
		Arizona Avenue Extension	0.29	0	3 (2 NB, 1 SB)		
		Honeycutt Rd Widening	0.3	2	4		
2	**Smith-Enke Widening**	Two Projects: 1) One-quarter mile east of Santa Rosa Dr/Province Pkwy to Porter Rd and 2) Chase Dr to White & Parker Rd	1.0	2	4	2015-16	1,421,404
3	**Honeycutt Widening**	Honeycutt Rd: Porter Rd to White & Parker Rd	1.0	2	4	2015	1,676,000
4	**Edison Extension**	Edison Rd Extension to SR 238	0.64	0	4	2015	2,385,584

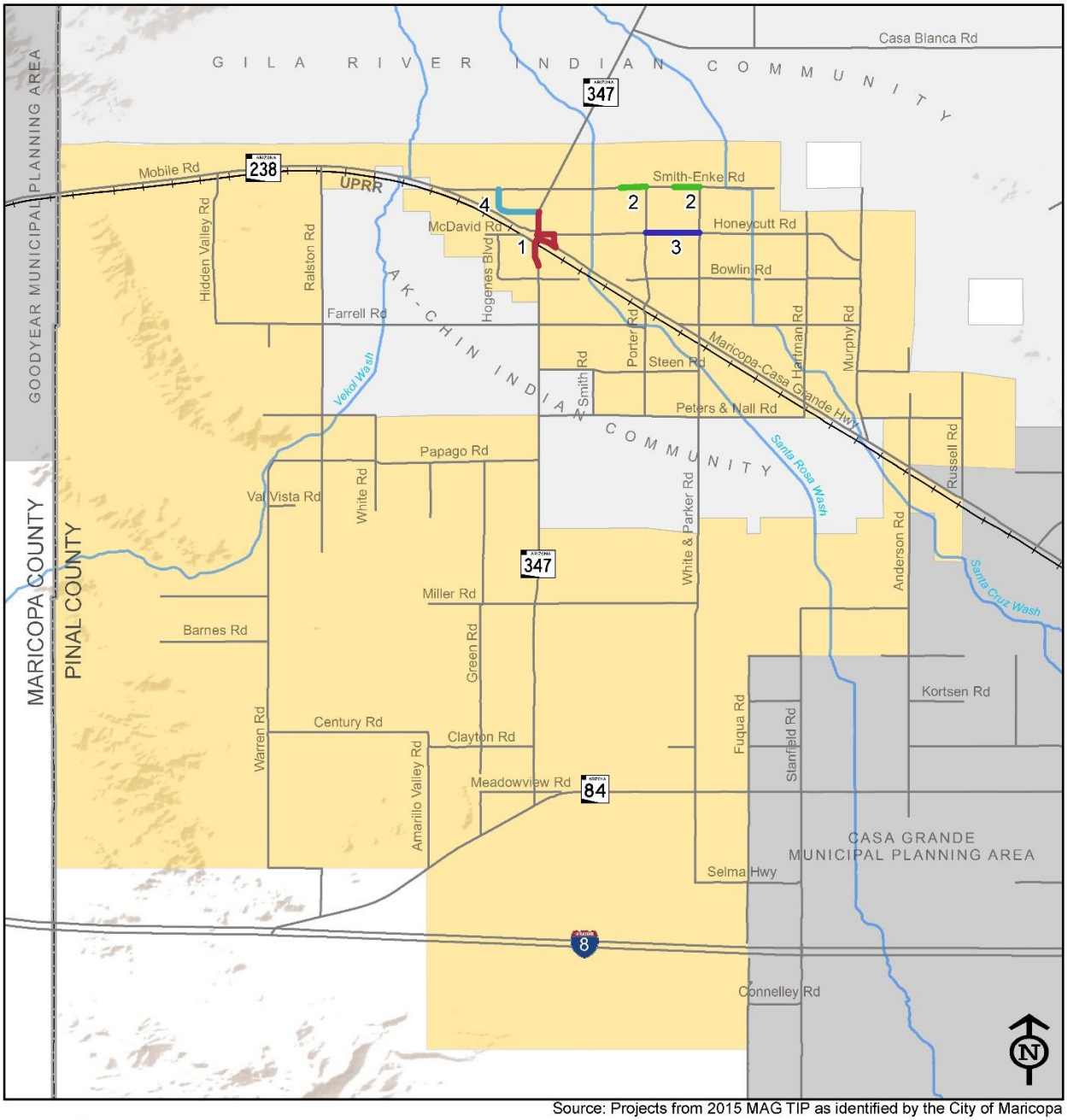
Source: 2015 MAG Transportation Improvement Program (TIP). Compiled from "City of Maricopa Projects FY 2014 - FY 2018" and City of Maricopa Capital Improvement Plan (CIP).

Figure 5-5 illustrates the location of these programmed roadway improvements. The numbers in the Figure 5-5 correspond to the project numbers listed in Table 5-1. Several of the projects contained in the improvement programs were omitted from the E+C Roadway Network in order to confirm the need and timing of the projects. That is not to say that these projects will not be constructed, particularly should alternate funding sources become available, but the intent is to allow this TMP process to provide additional input as to the necessary timing of these other improvements.

MAJOR ROADWAYS

This section of the TMP presents specific information relating to the functional classification and facility type of major roadways serving the Maricopa MPA. Clearly identifying the functional classification and type of

Figure 5-5 | Location of Programmed Roadway Improvements



Source: Projects from 2015 MAG TIP as identified by the City of Maricopa

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area

Programmed Improvement

- 1. SR-347 Overpass Project
- 2. Smith-Enke Rd Widening
- 3. Honeycutt Rd Widening
- 4. Edison Rd Extension

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facilities forming the roadway network is an important first step towards establishing the necessary information to evaluate network needs through travel demand modeling and traffic analysis/planning processes.

FUNCTIONAL CLASSIFICATION HEIRARCHY

The concept of functional classification, as noted earlier, establishes a decision/design framework for a community's roadway network. Roadways are classified by the type of function they serve.

> *The level of service required to fulfill [each] function for the anticipated volume and composition of traffic provides a rational and cost-effective basis for the selection of design speed and geometric criteria within the range of values available to the designer (for the specified functional classification). The use of functional classification as a design type should appropriately integrate the highway planning and design process.*[2]

The FHWA provides elaboration of this concept as a roadway network design tool:

> *Once the functional classification of a particular roadway has been established, so has the allowable range of design speed. With the allowable range of design speed defined, the principal limiting design parameters associated with horizontal and vertical alignment are also defined. Similarly, a determination of functional classification establishes the basic roadway cross section in terms of lane width, shoulder width, type and width of median area, and other major design features.*[3]

Higher order roadways, such as expressways and arterials, are the backbone of intra-urban and inter-regional highway systems. These roadways facilitate the movement of people and commodities safely and quickly. However, the City of Maricopa remains in the developmental stage regarding a comprehensive roadway network, partially because of the global economic downturn that has affected state and local funding abilities. The recession also resulted in a disjointed development pattern associated with numerous master-planned developments that were halted mid-way through the development process The 2008 RTP Update confirmed the following reasons for the existence of an undeveloped roadway network, as illuminated in previous transportation studies. The original assessment has been augmented below with contemporary information:

- The Santa Rosa Wash and Santa Cruz Wash are barriers to circulation. Many significant roads, particularly in the rural portions of the Study Area still have low-water crossings that can inhibit travel during storm events.
- Development in some areas encroaches onto existing roadway right-of-way, as well as boundaries of the Ak-Chin Indian Community.
- The MCGH is paralleled by the UPRR tracks, both of which run diagonally to the section line roads. This results in numerous at-grade railroad crossings and roadway intersections that are skewed (i.e., not 90 degrees), which traffic and safety engineers consider undesirable geometric conditions. The proximity of the highway to the railroad also creates generally unsafe intersection

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[2] *A Policy on the Geometric Design of Highways and Streets* (Green Book), American Association of State Highway and Transportation Officials (AASHTO), Chapter 1, pg. 17.

[3] *Flexibility in Highway Design*, Federal Highway Administration (FHWA).

configurations that complicate the formulation of practical solutions. Grade separation of SR 347 at the UPRR tracks is a project that now is in the design stage under ADOT sponsorship. A recently completed study examined the potential for grade separating White & Parker Road at the MCGH and UPRR tracks, a proposition that could involve construction of an extended bridge structure to span both the highway and the railroad. Current conditions at this at-grade intersection create several problems relating to traffic flow and safety. The operational and safety issues associated with at-grade railroad crossings are aggravated by the barrier effect of the railroad corridor and the proximity of Santa Rosa Wash. Both features have resulted in constraints on the development of more north-south roadways in the northern portion of the Study Area. A problem relating to major improvements at this intersection is impacts on the development potential of adjacent land. A sizable investment to improve the intersection through grade separation will need to be preceded by additional detailed studies to ensure access to developable land south of the UPRR is optimized for commercial-industrial development.

- Many roadways are impassable when flooding occurs. For example, Peters & Nall Road has only an unimproved low-water crossing at Vekol Wash, and Porter Road has a paved low-water crossing at Santa Rosa Wash. In addition, Rancho El Dorado Parkway, the principal loop roadway serving the El Dorado development, has two paved low-water crossings of the Santa Rosa Wash.
- The collector roadway system that feeds the arterials is not fully developed. Many existing, as well as planned developments have uncoordinated collector systems. However, the collector roads frequently are offset from one development to the next.
- Currently, there are no major projects programmed by ADOT, Pinal County, or the City within the Study Area, other than those identified earlier in Table 5-1.
- Traffic safety was considered to be a serious issue as rapid growth occurred in the early 2000s. These concerns appear to have been abated. Although the total number of crashes has increased year over year between 2010 and 2013 (the most recent year for which data is available), the number of crashes involving fatalities or injuries has decreased. Between 2010 and 2011 the crashes involving a fatality doubled; although the increase was from two to four, it is still significant that the number doubled. More importantly, the number of fatalities more than doubled from two to five. There were a total of 241 crashes in 2011; 92 crashes involved injuries in 2011, with 170 persons injured. There were 251 crashes in 2012, only two of which resulted in fatalities, and injury crashes declined to 80, but 116 persons were injured. In 2013, there were 266 crashes with only one reported fatality. Injury crashes decline a second straight year to 74, and the number of injured persons decreased to 100.[4]
- A corollary issue to the occurrence of crashes is the problem of incident management. In particular, crashes involving serious injuries or fatalities can result in lengthy delays on SR 347. Traffic congestions or delays also can result for the occurrence of crashes on Interstate 10 (I-10) that cause Department of Public Safety (DPS) officers to reroute traffic through the City via SR 347. As SR 347 is the primary artery for the City of Maricopa, additional review of crash history and locations would be advisable to assure the City is able to formulate an effective incident management policy.

[4] Arizona Motor Vehicle Crash Facts, 2010 – 2013 at http://azdot.gov/mvd/Statistics/arizona-motor-vehicle-crash-facts.

Connectivity of the roadway network in the Study Area has been compromised by a lack of coordination between the City of Maricopa and developments sponsors in the unincorporated area around the City. This issue has resulted in discontinuous roads and misaligned roads, as well as inconsistency in design and construction. Notwithstanding the numerous issues adversely affecting the transportation system of the City, as noted above, the City of Maricopa today is served by a functional arterial backbone system supported by several roadways that function as collectors. This backbone system facilitates travel within the City, into and out of the City, throughout the Study Area, and beyond. As the roles of these roadways become more and more defined relative to traffic movements, the degree to which access to adjoining land is permitted decreases. These relationships assure a higher level of service (i.e., facilitate greater mobility) along roadways with high travel demand. These functional classification categories. Figure 5-6 shows the functional classification of the major roadways serving the Maricopa Study Area.

FACILITY TYPE

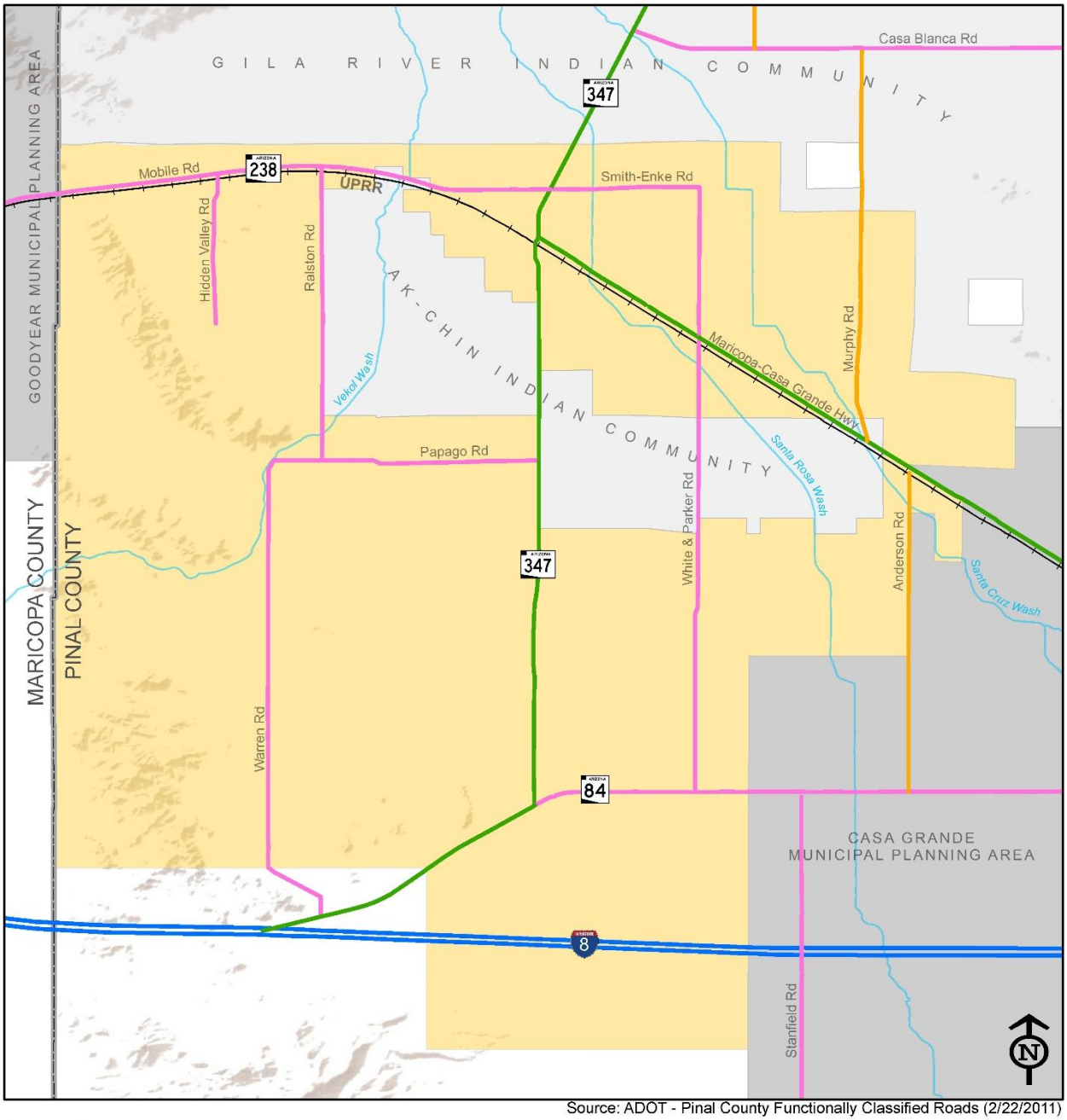
In addition to functional classification, roadways are categorized as to facility type. The input for travel demand models includes identification of the facility type, which directly translates to a roadway's ability to accommodate traffic. That is to say, a roadway may function as an arterial and be very important to community or regional mobility; however, the roadway still may only be a two-lane facility that has one-half the traffic capacity of a four-lane facility. As such, the typical criteria used to categorize roads into facility types are based on attributes that identify per-lane roadway capacity. Among these attributes are the number of lanes, the presence of medians and turn bays, the type of roadway surface, and the frequency of access points associated with intersecting streets and abutting properties.

Obviously, there are some similarities between facility type and functional classification; however, it is not uncommon for roadways to have functional classifications and facility types that differ. Therefore, travel demand models incorporated a "look-up table" approach that assigns speed and capacity to roadways in the network based on facility type. The process identifies the facility type of differing links of a roadway network, looks up the attributes of roadway operations, and assigns traffic flows in a systematic way. The facility type definitions modeled in the Regional Travel Demand Model (TDM) for the MAG region, which now includes the Maricopa MPA, are described in Table 5-2.

Table 5-2 | MAG Facility Type Definitions

Facility Type	Definition
Freeway	Divided arterial highways designed for the safe, non-impeded movement of large volumes of traffic with full control of access and grade separation at intersections. Also included in this category are freeway to freeway ramps.
Expressway	Used for through traffic with full or partial control of access and generally with at-grade intersections. These are usually state highways.
Major Arterial	Characterized by multi-lane divided or undivided roadways or undivided one-way roadways having two or more lanes and typical urban design with little or no control of access. Serve major through traffic volumes between activity centers and a substantial portion of trips entering and leaving the area. Connect freeways with major traffic generators.
Collector	Provide activity access and traffic circulation service within residential, commercial, and industrial areas. The access function is more important than that of arterials. The operation of collectors is not always dominated by traffic signals. The collector street also channels traffic from local streets to the arterial system.
Unpaved Road	Provides traffic circulation primarily in the more rural areas of the modeling domain, frequently along the mile grid network.

Source: Regional Travel Demand Model Reference Material, Maricopa Association of Governments (MAG).



Source: ADOT - Pinal County Functionally Classified Roads (2/22/2011)

Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area

Functional Class

- Interstate
- Minor Arterial
- Major Collector
- Minor Collector

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Figure 5-6 | Functional Classification of Major Study Area Roadways

A map of major roadways in the Maricopa MPA by facility type is presented in Figure 5-7. This same information is presented in tabular form in Table 5-3. Note that in Table 5-3 the functional classification differs from facility type, because the role or function of the roadway segment does not necessarily reflect the type of facility constructed for travel within the MPA. Facility type depends more on the level of travel demand, traffic patterns, and need for access than mobility among and between various local or regional origins and destinations.

5.2 EXISTING TRANSIT SERVICES

Public transportation services operated by the City currently include limited Demand Response (DR) or special, destination-oriented services (e.g., Veteran's Clinic and hospitals). Taxicab services are available from Casa Grande, southeast of the City, and Chandler, northeast of the City; both cities are approximately 20 miles from Maricopa. Intercity/Interstate bus service provided by Greyhound Lines also can be accessed only in Casa Grande or Chandler. The City *General Plan* recognizes growth within the City calls for additional, alternative transportation options, especially with regard to reducing traffic along SR 347. The Circulation Element establishes the principle to "Partner with Pinal County, Gila River and Ak-Chin Indian Communities and ADOT to seek regional solutions to needed transportation improvements."[5]

DEMAND RESPONSE SERVICE

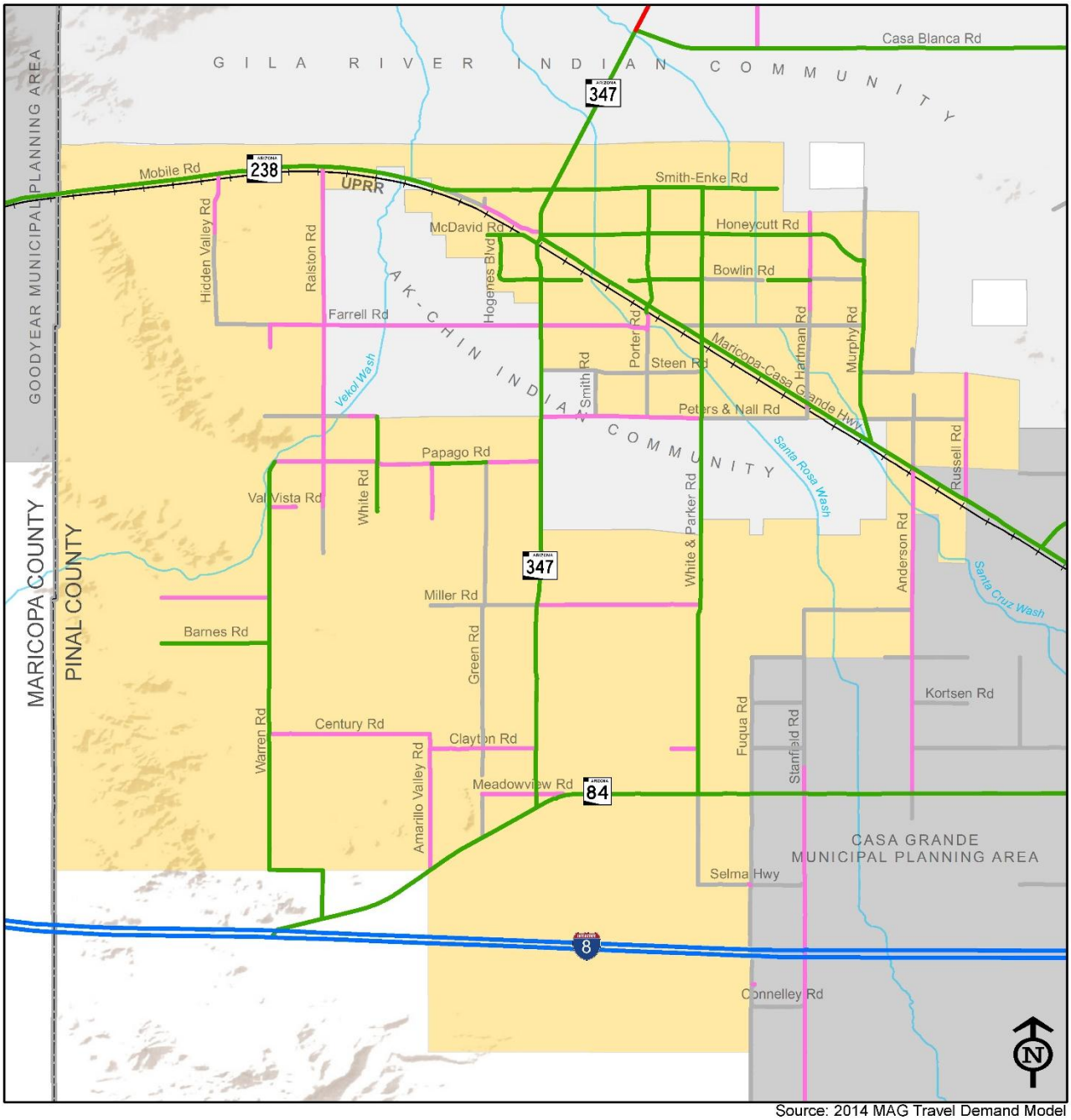
The City of Maricopa maintains a DR bus transit program, operating under the name "City of Maricopa Express Transit" (COMET). The cost of one-way local trips within the City is one dollar ($1) per person, and the service is offered Monday through Friday. The cost of regional, round-trip service to Chandler and Casa Grande is three dollars ($3) per person. This service is limited to Chandler Regional Hospital on Tuesdays and Casa Grande Regional Hospital on Thursdays. Stops may also be made within a five-mile radius of each of these locations. According to the COMET Update and Vision presented to the MAG Transit Committee, the regional service served 2,695 trips in 2013.[6]

FIXED-ROUTE SERVICE

In 2007, ADOT recommended broadening partnerships, infrastructure, and services for transit within the City of Maricopa. ADOT also encouraged the community to move towards establishing permanent express/commuter services to downtown Tempe and South Chandler. Pilot transit services to Phoenix and Tempe were initiated and provided until September, 2010, through the maricopaXPRESS (MAX). The Phoenix route operated between downtown Maricopa and downtown Phoenix (Central Station) twice daily during the peak morning and evening commute hours, Monday through Friday. The Tempe route, referred to by the City as local excursion service, provided connections to Arizona State University (ASU) and downtown Tempe between the hours of 10:00 AM and 3:00 PM. However, with the loss of state transportation funding, the City opted to discontinue MAX service in 2010. Recently, the City began offering a limited fixed-route service with ¾ mile deviations to pick up individuals who are unable to get to a bus stop. This route service nine stops at popular destinations throughout the City. This service operates from 7:00-9:00 AM and from 3:00-5:00 PM, Monday through Friday. The fare is $.50 per boarding.

[5] City of Maricopa *General Plan*, January 2006
[6] City of Maricopa Express Transit (COMET) Update and Vision, February 2014

Figure 5-7 | Facility Type of Major Study Area Roadways



Source: 2014 MAG Travel Demand Model

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area

Facility Type

- Freeway
- Expressway
- Major Arterial
- Collector
- Unpaved Road

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Table 5-3 | Major Roadways by Functional Classification and Facility Type

Street Name	Extents From (N,W)	Extents To (S, E)	ADOT Functional Classification	MAG Model Facility Type
East-West Roadways				
SR 238	Pinal/Maricopa County Line	SR 347	Major Collector	Major Arterial
Smith-Enke Rd	SR 347	White & Parker Rd	Major Collector	Major Arterial
Smith-Enke Rd	White & Parker Rd	Santa Cruz Wash		Major Arterial
Garvey Ave	SR 238	Green Rd		Unpaved Road
Garvey Ave	Green Rd	SR 347		Collector
McDavid Rd/**Edwards Ave**	Green Rd	SR 347		Major Arterial
Honeycutt Rd	SR 347	Murphy Rd		Major Arterial
Bowlin Rd	Hogenes Blvd	Santa Cruz Wash		Major Arterial
Alan Stephens Pkwy/Bowlin Rd	Stonegate Rd	White & Parker Rd		Major Arterial
Bowlin Rd	White & Parker Rd	Fuqua Rd		Unpaved Road
Bowlin Rd	Fuqua Rd	Hartman Rd		Major Arterial
Bowlin Rd	Hartman Rd	Murphy Rd		Unpaved Road
Farrell Rd	Hidden Valley Rd	Porter Rd		Collector
Farrell Rd	Maricopa-Casa Grande Hwy (MCGH)	Murphy Rd		Unpaved Road
Steen Rd	SR 347	White & Parker Rd		Unpaved Road
Steen Rd	Murphy Rd	Anderson Rd		Unpaved Road
Peters & Nall Rd	Warren Rd	Ralston Rd		Collector
Peters & Nall Rd	Ralston Rd	Brewer Rd		Unpaved Road
Peters & Nall Rd	Brewer Rd	White Rd		Collector
Peters & Nall Rd	SR 347	White & Parker Rd		Collector
Peters & Nall Rd	White & Parker Rd	Hartman Rd		Unpaved Road
Peters & Nall Rd	Murphy Rd	Russell Rd		Unpaved Road
MCGH	SR 347	Anderson Rd	Minor Arterial	Major Arterial
Papago Rd	Warren Rd	Amarillo Valley Rd	Major Collector	Collector
Papago Rd	Amarillo Valley Rd	Green Rd	Major Collector	Major Arterial
Papago Rd	Green Rd	SR 347	Major Collector	Collector
Val Vista Rd	Warren Rd	Thunderbird Rd		Collector
Miller Rd	Sage St	Warren Rd		Collector
Miller Rd	Amarillo Valley Rd	SR 347		Unpaved Road
Miller Rd	SR 347	White & Parker Rd		Collector
Miller Rd	Stanfield Rd	Anderson Rd		Unpaved Road
Barnes Rd	Sage St	Warren Rd		Major Arterial
Randolph Rd	Fuqua Rd	Stanfield Rd		Unpaved Road

Table 5-3 | Major Roadways by Functional Classification and Facility Type (Continued)

Street Name	Extents From (N,W)	Extents To (S, E)	ADOT Functional Classification	MAG Model Facility Type
East-West Roadways (Continued)				
Randolph Rd	Pala Rd	Anderson Rd		Unpaved Road
Century Rd	Warren Rd	Amarillo Valley Rd		Collector
Clayton Rd	Amarillo Valley Rd	SR 347		Collector
Clayton Rd	Leland Rd	White & Parker Rd		Collector
Meadowview Rd	Green Rd	SR 84		Collector
SR 84	Metropolitan Planning Area (MPA) Boundary at Amarillo Valley Rd	SR 347	Minor Arterial	Major Arterial
SR 84	SR 347	Fuqua Rd	Major Collector	Major Arterial
Selma Hwy	White & Parker Rd	Fuqua Rd		Unpaved Road
I-8	Amarillo Valley Rd Alignment	Fuqua Rd	Interstate	Freeway
North-South Roadways				
Hidden Valley Rd	MPA Boundary at Gila River Indian Community	SR 238		Unpaved Road
Hidden Valley Rd	SR 238	Farrel Rd	Major Collector	Collector
Warren Rd	Farrell Rd	Pima Rd		Collector
Warren Rd	Papago Rd	MPA Boundary at Robin Rd	Major Collector	Major Arterial
Ralston Rd	SR 238	Val Vista Rd		Collector
Ralston Rd	Val Vista Rd	Teel Rd		Unpaved Road
White Rd	Peters & Nall Rd	Val Vista Rd		Major Arterial
Amarillo Valley Rd	Papago Rd	Val Vista Rd		Collector
Amarillo Valley Rd	Century Rd	SR 84		Collector
Green Rd	Papago Rd	Carefree Pl		Unpaved Road
Green Rd	Meadowview Rd	SR 84		Unpaved Road
Hogenes Blvd	McDavid Rd	Bowlin Rd		Major Arterial
SR 347	MPA Boundary at Gila River Indian Community	SR 84	Minor Arterial	Major Arterial
Smith Rd	Steen Rd	Peters & Nall Rd		Unpaved Road
Porter Rd	Smith-Enke Rd	Santa Rosa Dr		Major Arterial
Porter Rd	Santa Rosa Dr	Farrell Rd		Collector
Porter Rd	Farrell Rd	Peters & Nall Rd		Unpaved Road
White & Parker Rd	Smith-Enke Rd	SR 84	Major Collector	Major Arterial
White & Parker Rd	SR 84	Selma Hwy		Unpaved Road
Fuqua Rd	Randolph Rd	MPA Boundary at I-8		Unpaved Road

Table 5-3 | Major Roadways by Functional Classification and Facility Type (Continued)

Street Name	Extents From (N,W)	Extents To (S, E)	ADOT Functional Classification	MAG Model Facility Type
North-South Roadways (Continued)				
Hartman Rd	MPA Boundary at Gila River Indian Community	Sorrento Blvd		Collector
Hartman Rd	Sorrento Blvd	Peters & Nall Rd		Unpaved Road
Stanfield Rd	Miller Rd	Randolph Rd		Unpaved Road
Murphy Rd	MPA Boundary at Gila River Indian Community	Honeycutt Rd	Minor Collector	Unpaved Road
Murphy Rd	Honeycutt Rd	MCGH	Minor Collector	Major Arterial
Anderson Rd	Jarrett Rd	Steen Rd		Unpaved Road
Anderson Rd	Lulu Jane Dr	MCGH		Unpaved Road
Anderson Rd	MCGH	Randolph Rd	Minor Collector	Collector
Russell Rd	Steen Rd	MCGH		Collector

VANPOOL SERVICE

MAX service was replaced with a vanpool service. Efforts to assist Maricopa residents with the commute to the Phoenix metropolitan area were carried forward through a partnership with Valley Metro's Vanpool Program. Valley Metro Vanpool provides 6- to 15-passenger vans to persons, who live and work near each other, to facilitate carpooling together. One person out of the group volunteers to be the driver and riders pay monthly fees that cover the van, fuel, maintenance, and insurance. The Valley Metro Vanpool vehicles are allowed to use the High-Occupancy Vehicle (HOV) lanes, which decreases travel time to and from work. Average monthly fares, based on 80% occupancy of the vans, not including fuel or parking costs, range from $56 to $91 per person, depending upon mileage and occupancy.[7]

TRANSIT-ORIENTED DESIGN

The ADOT transit service recommendations also urged the City to identify and adopt a Transit-Oriented Design (TOD) Overlay District to support transit serves. The City incorporated a TOD Development Overlay District as Article 302 in its revised Zoning Code adopted November 5, 2014 (Ordinance 14-12, Effective December 5, 2014). Two TOD Development Overlay Districts have been defined. The TOD-1 District permits high-density, mixed-use developments within one-eighth mile of high-capacity transit station areas and associated intermodal facilities. The TOD-2 District permits medium-density residential and mixed-use commercial/office developments between one-eighth mile and one-quarter mile of high-capacity transit station areas and associated intermodal facilities. The two Overlay Districts will support development of an appropriate mix and density around stations associated with future Light Rail Transit (LRT) or Heavy Rail Transit systems that may be constructed in the City.

[7] Valley Metro Vanpooling 2013 at http://www.valleymetro.org/images/uploads/rideshare_documents/Valley_Metro_Vanpool_Brochure_English_12-2013.pdf.

REGIONAL TRANSIT SERVICES

ADOT envisions the City of Maricopa entering into a regional organizational structure that offers a broad range of transit services, which would include studying feasibility of potential future Commuter Rail options. The SR 347 corridor would be a prime candidate for modern rail service connecting with the Phoenix metropolitan area.

5.3 FACILITIES FOR NON-MOTORIZED TRAVEL MODES

Bicycle and pedestrian facilities have been developed in conjunction with various master-planned residential developments, but these facilities are not continuous throughout the community. A comprehensive system of travel for non-motorized transportation modes is not yet in place, as various available facilities lack the connectivity for necessary travel about the community.

GENERAL PLAN RECOMMENDATIONS

The City of Maricopa *General Plan*, adopted January 17, 2006, provided a general framework for parks, open space, and paths/trails within the City. The first of many recommendations associated with these community assets is to prepare a Master Plan addressing parks, special use facilities, trails, and open spaces. Thus, the 2008 City of Maricopa *Parks, Trails, and Open Space Master Plan* (*PTOS*) implements the City of Maricopa *General Plan* recommendations by establishing more specific guidance for developing paths and trails throughout the MPA. An important aspect of the *PTOS* is ensuring the edge areas, i.e., areas adjacent neighboring municipalities and Pinal and Maricopa counties, are addressed in terms of park service area coverage, recreational opportunities, open space availability, and trail connectivity.[8] The *PTOS* was developed following an extensive inventory and analysis of the Maricopa MPA to identify future trail alignment possibilities, key open space opportunities, and future needs for parks.

A key shortcoming discovered in preparation of the *PTOS* was the lack of parks, trails, and open space to serve overall community needs. Although master-planned communities provide these "life style amenities," they generally are for private use only. A general shortfall was identified in the area of services and facilities for organized sports, public swimming pools/aquatic centers, dog parks, skate parks, and multi-use community centers. Although the *PTOS* is focused on forging a framework for future parks, trails/paths, and open spaces, it included guidance and design standards for full accommodation of pedestrian status and bicycles on trails/paths. Thus, although not a pedestrian and bicycle plan, per se, the *PTOS* provides foundational information for development and integration of walking (including specialized transportation modes) and bicycling traffic as viable modes of transportation.

SUBDIVISION REGULATIONS

Today, as a result of the PTOS and an amendment to the City's Subdivision Regulations was adopted to address connectivity of the City's recreation and open space infrastructure. Revisions to the Subdivision Regulations based on goals and objectives established by the *General Plan* encourage inclusion of open space and trails in new developments. Guidance now is available to developers and the City's decision-makers regarding the provision of trails and open spaces for a variety of activities, such as walking,

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[8] *Parks, Trails, and Open Space Master Plan* (PTOS), City of Maricopa, October 2008

bicycling, sports, and neighborhood events.[9] Subdivision Regulations call for developers to assure connectivity of internal development paths/trails with adjacent neighborhoods. While many new sidewalks and trails have been created as part of residential development in past years, full connectivity to community destinations or between neighborhoods and developments has yet to be accomplished. Although the PTOS and revised Subdivision Regulations now provide independently the basis for addressing specific community needs, there remains a need to align the goals, objectives, and various elements of these two documents to provide a rational framework for advancing development of community-based recreation and open space facilities. Figure 5-8 displays the current trail network in the MPA, and Figure 5-9 shows the proposed facilities adopted within the PTOS.

REGIONAL BICYCLE FACILITIES

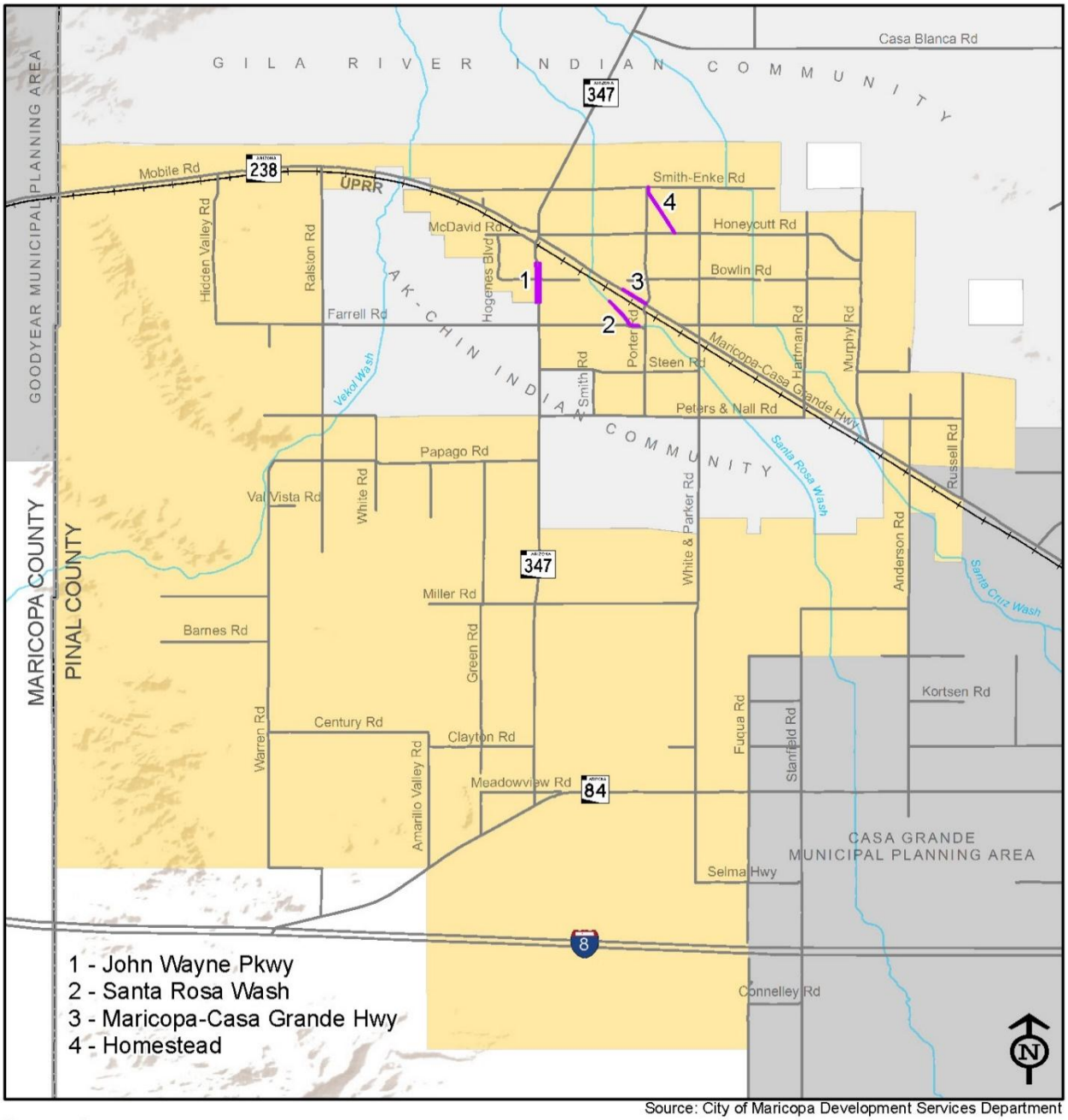
Regional bike connectivity, beyond the activities of the City of Maricopa, consists of only one bike route that lead into the City of Maricopa through the Gila Indian River Community to the north. SR 347 is designated as a paved bike shoulder route.[10] Establishing connectivity with this bike route to the north would be a prominent first step towards creating a regional bicycle system for the MPA. As the City is now a member of MAG, the resources and guidance developed by this region-serving organization can be tapped for further guidance and assistance in developing a multimodal transportation system that more fully accommodates bicycles. These resources might include:

- **MAG Regional Bikeway Master Plan 2007 and Bikeways Map** – This guidance, which includes supporting planning studies, provides guidance for developing On-Street Bikeways, Multi-Use Paths, and establishing bikeway connectivity.
- **MAG Compete Streets Guide (2011)** – The Complete Streets concept enhances the overall capacity of an urban street, increase property values, aids in promoting healthy activity, and improves the sense of place for residents. Prepared as a resource for MAG members, this Guide charts a process to aid in developing Complete Streets, defined simply as facilities that fully accommodate non-motorized (i.e., pedestrians, bicycles, and other non-traditional modes of travel) and public transportation modes on the basis as automobiles and trucks. The Guide provides a variety of strategies for developing Complete Streets and provides an approach for accomplishing desired results.

Additional, more detailed discussion of the development of bicycle facilities in the Study Area is presented in the Section 7.0 - Complete Streets Element and Section 8.0 - Trails and Pathways Element.

[9] City Ordinance 05-07 adding new Section 407, Open Space Requirements and Design Standards, to Chapter 14, Subdivision Regulations.
[10] MAG Bike Plan, prepared by the Bicycle and Pedestrian Committee, 2012

Figure 5-8 | Existing Trails Map



Source: City of Maricopa Development Services Department

Legend

- Counties
- Railroad
- Major Washes
- TMP Study Area
- Existing Trails

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Figure 5-9 | 2008 Parks, Trails and Open Space Master Plan

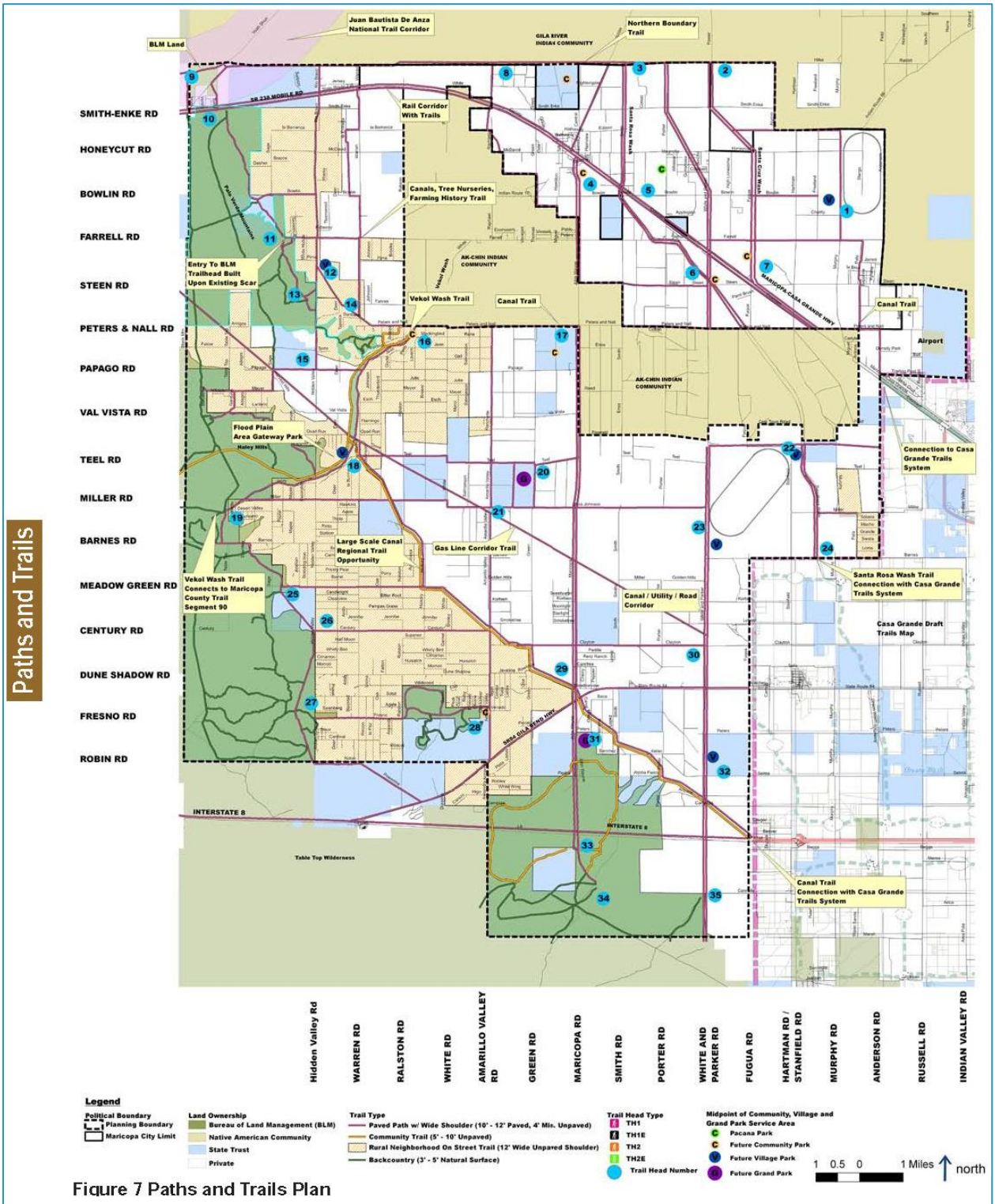


Figure 7 Paths and Trails Plan

* Proposed paths and trails indicated are predominantly on BLM lands, 100 year flood plains, utility corridors, open space areas and canal corridors. Paths and trails shown indicate the intent of the path and trail system, actual paths and trails will require further detailed studies.
** See Appendix C for full size maps.

PEDESTRIAN ACCOMMODATIONS

MAG also has engaged in developing plans and guidance for the accommodations of pedestrians in communities within its region. The Complete Streets Guide cited above (refer also to Section 7.0, Complete Streets Element) focuses on expanding mobility opportunities for pedestrians, as well as bicycles. Two additional resources for pedestrian planning are:

- **MAG Pedestrian Plan 2000 (1999)** – Outlines plans and programs to better promote pedestrian travel and provides flexible design tools associated with roadway development and performance to assist MAG members in enhancing the walking environments of their communities.
- **MAG Pedestrian Policies and Design Guidelines (2005)** – Provides a source of information and design assistance to assist MAG members in developing policies, programs, and plans to enhance walking as an alternative transportation mode. It includes guidance for recognizing opportunities to enhance pedestrian travel, creating integrated facilities that better accommodate pedestrian movements, and developing pedestrian-focused areas.

5.4 RAILROAD SERVICE

The extension of railroad service to Arizona in the 1800s had a major influence on the location and settlement of the City of Maricopa. The railroad corridor, originally constructed in 1879, generally runs in a northwest by southeast alignment through the Study Area. A significant portion of service along this track through the City was diverted, when rail service was routed on a new line through Phoenix. A portion of the Phoenix route, which linked the Phoenix Subdivision in western Phoenix to the community of Wellton and City of Yuma in western Arizona, was referred to as the "Wellton Branch." The Wellton Branch was severely damaged by saboteurs in 1995, and the current operator – UPRR, has determined the damage to be too great a cost to repair. As a result, today, all transcontinental UPRR rail freight traffic and Amtrak passenger service operates on the original line through Maricopa.

UNION PACIFIC RAILROAD FREIGHT SERVICES

The UPRR recently completed double-tracking its line through the Study Area, and 45 to 55 trains per day currently operate through the City.[11] The additional track has been installed to accommodate expected growth in rail traffic, which will more than double in the future. As the number of trains increases and population continues to grow, the number vehicle hours of delay increases on north-south roadways crossing the tracks. This is particularly an issue on SR 347, which led to the latest study and design process to create a grade-separated crossing at the UPRR tracks and relocation of the Amtrak station approximately one mile north of the current intersection, as noted earlier.

The effect of railroad operations becomes a special concern relative to forecasting future traffic volumes on Study Area roadways and determining roadway performance (i.e., level of service). Potential delays associated with at-grade crossings of the UPRR tracks reduce the effective capacity of roadways with such crossings. Because, the railroad alignment runs parallel to and south of the MCGH, east of SR 347, traffic on several major north-south roads (in addition to SR 347) is affected by railroad-related delays, e.g., Porter and White & Parker roads within the City and Rio Bravo and Ralston roads west of the City. The barrier effect of the railroad corridor noted earlier also constrains north-south travel by limiting development

[11] City of Maricopa Transportation, http://www.maricopa-az.gov/web/business-environment/transportation.

of additional roadways, which has the long-term effect of restricting access to land south of the railroad corridor and potential development.

AMTRAK PASSENGER SERVICE

As noted earlier, Amtrak operates its Sunset Limited and Texas Eagle routes on the UPRR Sunset Route rail line through the Study Area with scheduled stops in the City of Maricopa. Rail passenger service at the Maricopa station, which is located just east of SR 347 at its crossing of the rail alignment, has been hindered by a short station platform (Figure 5-10). The station design and location requires Amtrak trains to

Figure 5-10 | Amtrak Station Location

locate each car individually with respect to the platform to facilitate boarding and alighting. The result is the trains block traffic flow on SR 347 as each car is aligned with the short platform.

Grade separation of SR 347 at the UPRR tracks (see Other Railroad Facility Improvements below) will eliminate delays associated with UPRR freight rail service. With grade separation of SR 347 at the UPRR, the current location of the Amtrak station, as shown in Figure 5-10, will be abandoned and a new station (refer to Figure 5-10) will be constructed approximately one mile to the northwest. Amtrak station services

will be integrated with the new Maricopa Transportation Center, which also is being developed alongside Edison Road, which is being extend to SR 238. The grade separation project, which requires relocation of the Amtrak station, will make access to the station more convenient and safer for patrons of Amtrak.

Maricopa is one of eight Amtrak Stations in Arizona; there are facilities in nine other localities in the state that provide surface access to these rail stations. Amtrak passenger service in Maricopa is the closest rail passenger access point for residents of the greater Phoenix area (30 miles south), although Flagstaff, about three hours north of Phoenix, offers an alternative for northern destinations. The Sunset Limited provides service from Los Angeles, California, to El Paso, Texas, then on to New Orleans, Louisiana. The Texas Eagle also provides service to Los Angeles, but continues northeast through Texas to Chicago, Illinois. Figure 5-11 shows the Amtrak route through the City and provides an excerpt from the Amtrak National Route Map that shows how service through the City connects with the larger Amtrak network. With connecting service in Los Angeles to San Francisco and in New Orleans to destinations on the East Coast, Amtrak service at Maricopa provides an opportunity for transcontinental travel within the U.S.

OTHER RAILROAD FACILITY IMPROVEMENTS

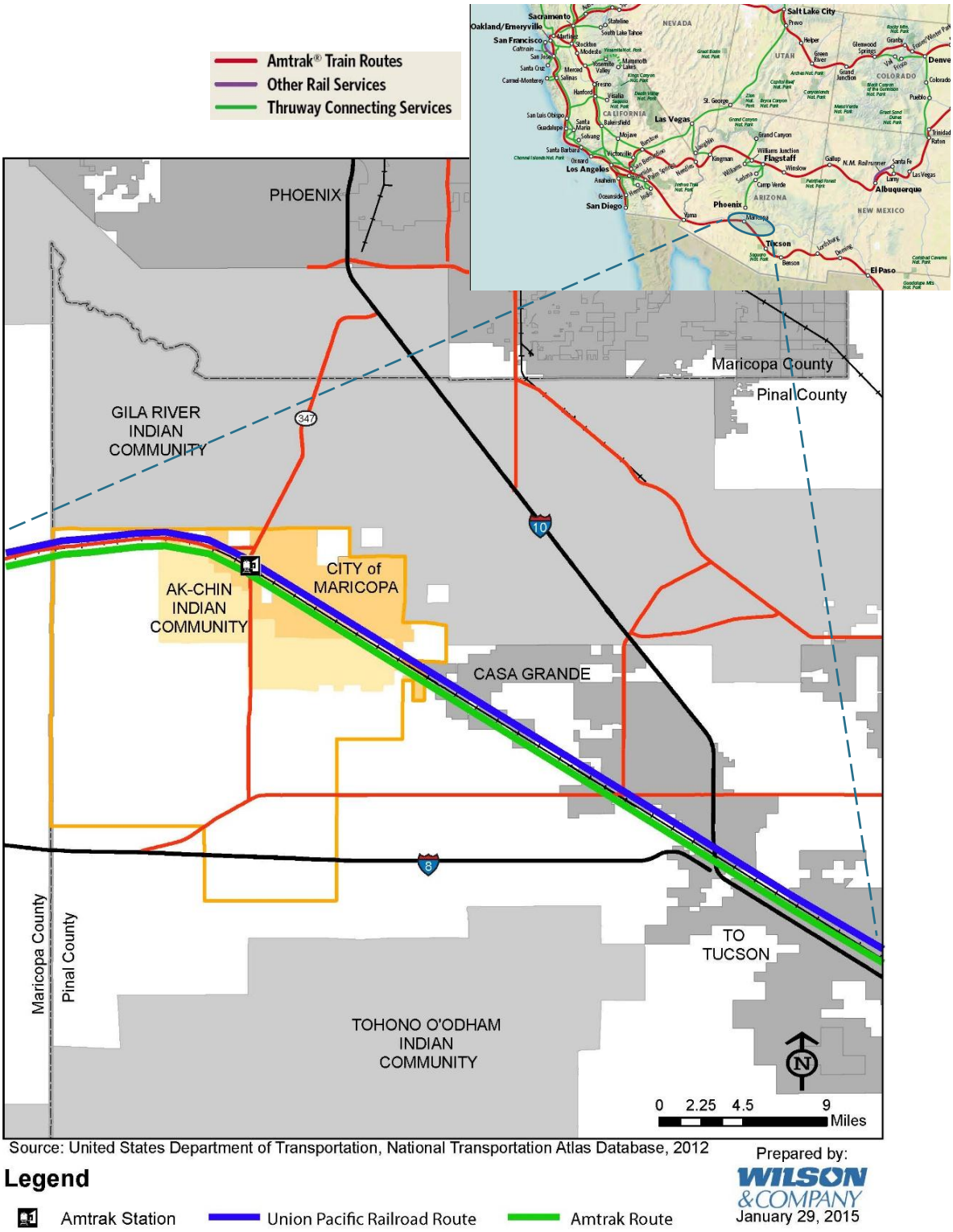
A project to grade separate SR 347 from the UPRR rail line with an overpass or underpass is currently underway and involves the study of a major portion of downtown Maricopa (see illustration at right). Although the ADOT Feasibility Report for this improvement was developed in 2007, the Draft Environmental Assessment (EA) and Section 4(f) Statement was only recently issued in October 2014. Nine alternatives were eliminated from detailed study; one Build Alternative (Alternative H) and the No Build Alternative were carried forward for further study. The Build Alternative would change access to and from SR 347, as well as reconfigure several adjacent roadways currently serving the area, including MCGH. Construction would require the acquisition of 11 commercial properties, taking up to a year to relocate. The Draft EA concluded that in the long term, improved traffic flow through the area would benefit local businesses, as people could more conveniently frequent local shops and service with less congestion hampering their movements.

Study Area of SR 347/UPRR Grade Separation
ADOT Project No. **347 PN 172 H7007 01L** Federal Aid No. **347-A(204)T**

The Build Alternative would meet the project purpose and need. It was developed and refined based on agency and public input and environmental considerations, and is considered feasible. It is being carried forward as the preferred alternative.[12] A Design Concept Report (DCR) has been developed that will permit ADOT to make a final decision, incorporate the project in the 5-Year Program, and move toward implementation. A Preferred Alternative Public Hearing was held December 3, 2014, to review publicly the DCR and related environmental studies for the Preferred Alternative. Subsequent to evaluation of public

[12] Environmental Assessment and Section 4(F) Evaluation, SR 347 at Union Pacific Railroad, October 2014

Figure 5-11 | Existing Rail Routes



comments received at the hearing and submission of the Final DCR, ADOT issued a Request for Qualifications to perform the design work necessary to implement this grade separation project.

5.5 FREIGHT SERVICE

The principal freight service supporting commercial businesses in the transport of goods and merchandise is provided by trucks. Although UPRR operates through the Study Area, the railroad company does not provide extensive support for commercial enterprises.

TRUCK FREIGHT

Virtually every business and household in the region depends to some extent on the mobility of trucks for shipping and receiving of consumer goods and materials for the manufacture/assembly of products. Trucking companies, freight terminals, distribution centers, and warehouses, as well as the local postal and express delivery systems, represent the primary components of the region's truck freight infrastructure. Each component represents either a destination or generator of freight movements relative to the supply line of regional, state, and national commerce. The trucking industry is heavily reliant on the region's roadway network of Interstate routes, US routes, and State Highways, as well as County Roads, over which trucks of all types and purpose travel.

According to the CAG RTP, Pinal County is strategically positioned to take advantage of the emphasis on the Sun Corridor, and two locations within the CAG Region (specifically Pinal County) have been determined potentially viable as mixing centers: northwest of Casa Grande and south of the I-8/I-10 Interchange. Access to the two interstates, the UPRR Sunset Route, and markets outside the region are critical factors for this determination, as well as geographic proximity to Mexico. In addition, the proposed alignment for the potential future I-11/CANAMEX Corridor crosses the Study Area between the southern boundary of the Ak-Chin Indian Community and SR 84/Gila Bend Highway (Figure 5-13). This new high-capacity facility with connections to I-8 south of Casa Grande and I-10 west of Buckeye in the Phoenix metropolitan area will open opportunities for truck freight services and other trucking-related facilities (e.g., servicing facilities, distributions warehouses, etc.) in the Study Area.

RAIL FREIGHT

The UPRR line operating through the City of Maricopa accommodates rail freight traffic. The railroad's Sunset Route is Arizona's second busiest rail line, and many of the trains operating on the line exceed one mile in length. All UPRR freight trains traveling from Los Angeles to El Paso pass through the City of Maricopa along the Sunset Route. This route carries approximately twenty percent of the railroad's traffic.[13] In addition, due to the current UPRR freight train routing without the Wellton track, all UPRR freight trains traveling from Los Angeles to Phoenix must pass through the City of Maricopa along the Sunset Route. The UPRR has double tracked approximately two-thirds of the Sunset Corridor as of 2014; double tracking has been completed through the Study Area. The *I-11 and Intermountain West Corridor Study* has identified opportunities for potential expansion of the rail system in Arizona, which could include UPRR service (Figure 5-12).

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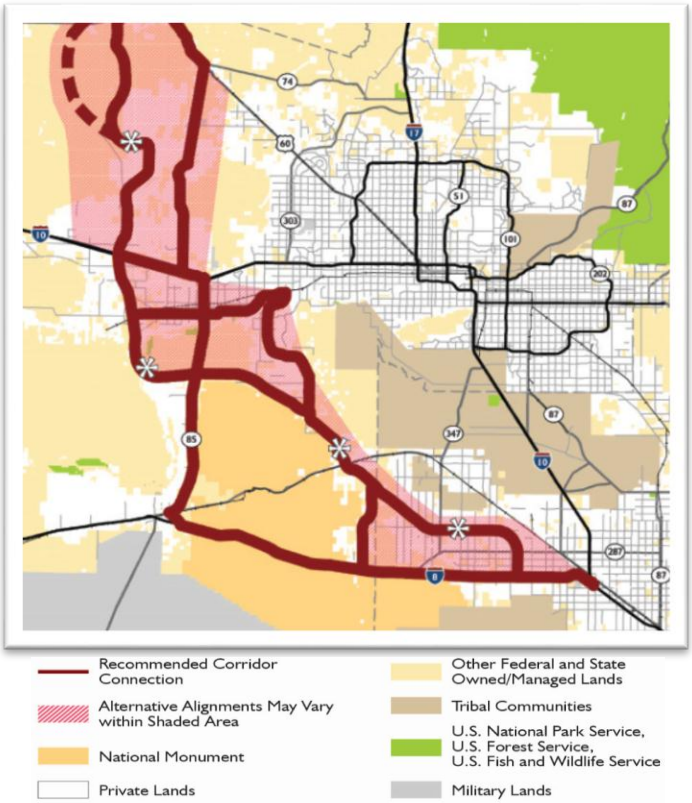
[13] Union Pacific in Arizona, 2014 Fast Facts, Building America at: http://www.up.com/cs/groups/public/documents/up_pdf_nativedocs/pdf_arizona_usguide.pdf; Retrieved June 2015.

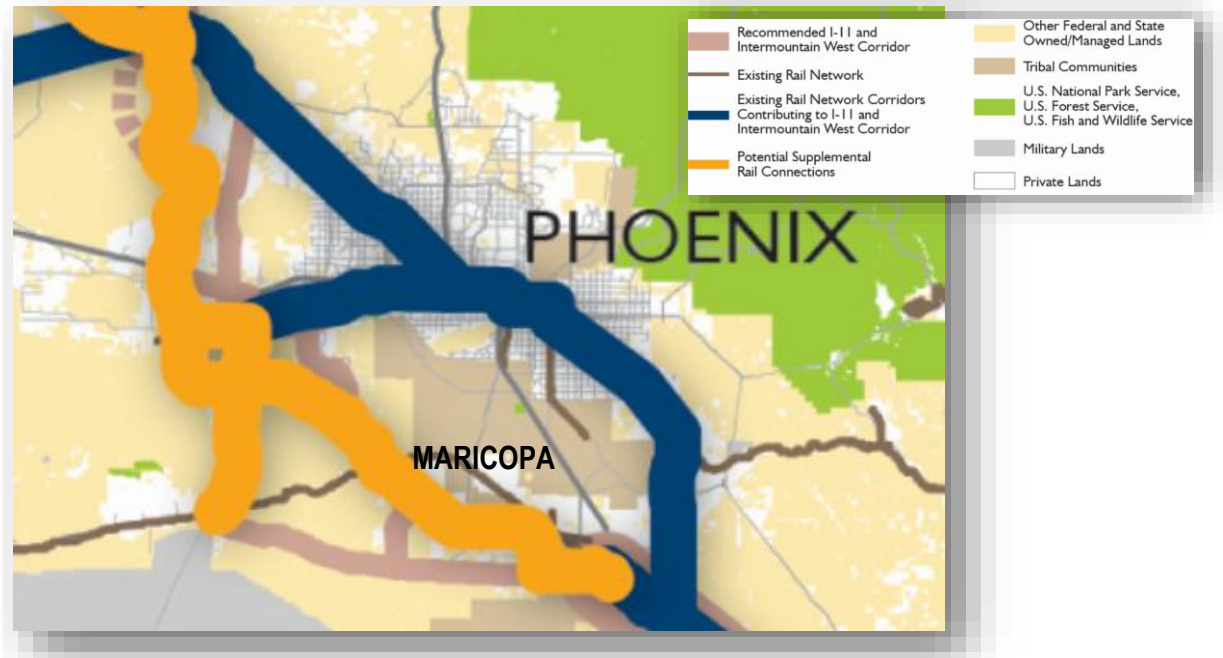
Figure 5-13 | Potential I-11/CANAMEX Corridor Alignments

The I-11/CANAMEX Corridor represents an illustrative transportation corridor that was accepted by the Maricopa Association of Governments (MAG) Regional Council and is included in the MAG Regional Transportation Plan. The * identifies one of a number of potential corridors that may considered in subsequent detailed engineering and environmental studies. A preferred corridor will not be recommended without review and approval of the Federal Highway Administration and extensive public involvement as prescribed under the provisions of the National Environmental Policy Act (NEPA).



Source: Excerpt from *I-11 and Intermountain West Corridor Study*, Arizona Department of Transportation (ADOT) and Nevada Department of Transportation (NDOT) at http://i11study.com/wp/?page_id=237; Retrieved June 2015.

Figure 5-12 | Feasible Potential Rail Corridors in Relation to the I-11/CANAMEX Corridor



Source: Excerpt from *I-11 and Intermountain West Corridor Study*, Arizona Department of Transportation (ADOT) and Nevada Department of Transportation (NDOT) at http://i11study.com/wp/wp-content/uploads/2014/08/Figure8FeasibleRailCorridors.jpg; Retrieved June 2015.

Nevertheless, there is no direct rail freight service available in the central portion of the City of Maricopa, i.e., there are no loading/unloading docks or spurs to serve local business. There is a siding on the west side of the line between White & Parker Road and Hartman Road that serves the Scotts Miracle-Gro Company fertilizer plant and cattle feed lot on Cowtown Road. Additionally, relocation of the Amtrak station west of SR 347 in conjunction with construction of a siding to access the station outside the main lines may provide an opportunity to create a rail spur that would support future commercial enterprises.

5.6 AIR SERVICE

Air service for Maricopa residents includes commercial air carriers at two airports in the Phoenix metropolitan area and General Aviation (GA) airports in Pinal County. Figure 5-14 highlights all airports potentially relevant to air travel by residents or visitors of the City of Maricopa and MPA.

REGIONAL AIR CARRIER SERVICE

Residents of the City of Maricopa and the Study Area must travel to Sky Harbor International Airport (Sky Harbor) about 32 miles north in the Phoenix metropolitan area to access scheduled regional, interstate, and international air service. Sky Harbor is one of the ten busiest airports within the United States. Travel to the airport has an effect on traffic volumes within the Study Area, particularly traffic volumes on major interregional highways, such as SR 347 and I-10, which are critical access facilities for the Study Area. Phoenix-Mesa Gateway Airport is in the southeastern area of Mesa, Arizona, and 32 miles southeast of Phoenix and 36 miles northeast of Maricopa. This airport serves as a reliever airport for Sky Harbor. At the present time, Allegiant Air is the only air carrier operating out of the Phoenix-Mesa Gateway Airport.

GENERAL AVIATION

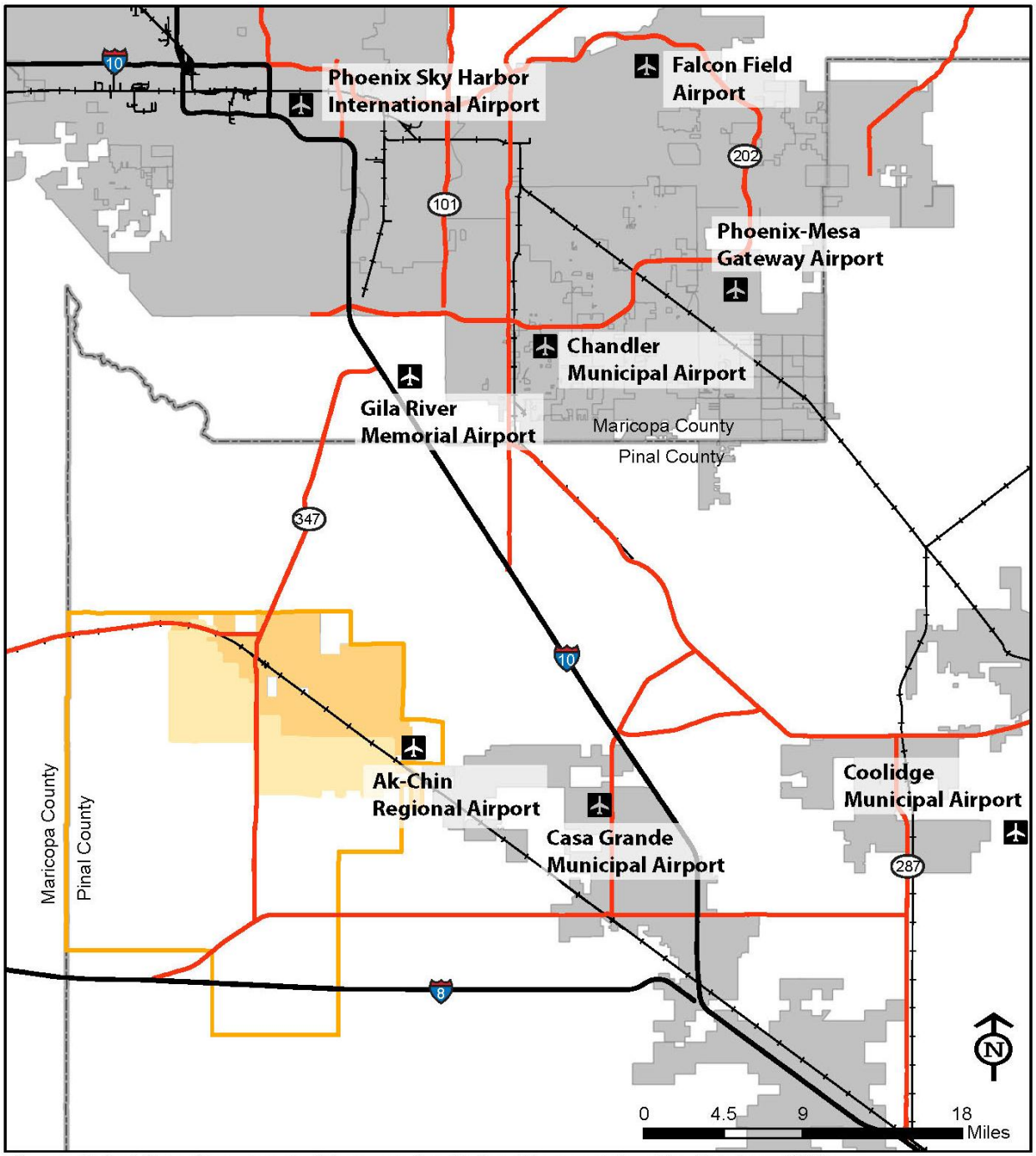
MARICOPA AIRPORT (FUTURE)

GA activity is growing throughout the United States. In 2007, the City of Maricopa conducted an Airport Feasibility Study to determine whether a GA airport was supportable. In a subsequent analysis, the 2008 Arizona State Airports System Plan (AZSASP) identified Maricopa as one of two potential Candidate Reliever Airport sites, should a new Maricopa Airport be constructed and demand in the region continues at the pace seen during preparation of the plan.[14] Although the only existing airport facility in Maricopa is the Sailport on SR 238, the AZSASP includes the determination that a Maricopa airport potentially would be eligible for consideration for listing in the National Plan of Integrated Airport Systems (NPIAS) in the future. A Reliever Airport is designated to relieve congestion at commercial service airports (e.g., Sky Harbor and Gateway) and provide improved GA access to the overall community. The conclusion in Appendix C of the AZSASP is that "activity related to the airport's development should be monitored for future NPIAS consideration."

The original 2007 Airport Feasibility Study states the airport should be geared to corporate use, pilot training, and recreational flying. An important concern arose from the study: current growth is rapidly absorbing undeveloped land available for an airport. It also recommended the City reserve 600 to

[14] Arizona State Airports System Plan-Appendix C NPIAS Candidate, 2008 at http://azdot.gov/docs/default-source/airport-development/azsaspappendixc-final.pdf?sfvrsn=2 and Appendix D, Reliever Candidate Airport Analysis.

Figure 5-14 | Airports Available to Residents and Visitors of the City of Maricopa MPA



Source: United States Department of Transportation, National Transportation Atlas Database, 2012

Prepared by: WILSON & COMPANY February 3, 2015

Legend

Airports | City of Maricopa | Ak-Chin Indian Community | Study Area

700 acres within the next few years to accommodate the new airport. Pursuant to the findings and conclusions of the 2007 Airport Feasibility Study, in February 2008, the Maricopa City Council approved the preferred site for a regional airport, which currently is known as Estrella Sailport. The site is located immediately north of SR 238 and approximately six miles to the west of SR 347, as referred to above.

Since release of the 2007 Airport Feasibility Study, the city, region, state, and nation experienced the worst economic recession in modern times. Therefore, a review of the study findings and conclusions would be appropriate in light of new economic conditions. Should the airport move toward development, it primarily would be funded through federal and state grants, resulting in a likely overall investment in the community exceeding $100 million. The City, in embracing the idea of a municipal airport, also conceived plans for developing an industrial park around the airport. The 2007 Airport Feasibility Study indicates economic activity related to the airport and industrial park potentially could generate 50,000 new jobs in Maricopa; as noted above, these findings would need to be tempered with new economic conditions in the region since the recession. Nevertheless, there is adequate lead time to permit careful planning for this facility and preclude development of sensitive land uses (e.g., homes) near the airport that will be negatively affected by residual noise from airplanes. With completion of subsequent studies and a decision to move forward with development of the airport, a Site Master Plan would be developed, including environmental studies and all necessary documents to request funds through the Federal Aviation Administration (FAA) and ADOT Aeronautics.

AK-CHIN REGIONAL AIRPORT

Beyond the possibility of a new Maricopa Airport, the existing Ak-Chin Regional Airport is a publicly-owned public use airport located in the east-central portion of the Study Area, just eight miles east-southeast of Downtown Maricopa. The airport is owned and operated under the authority of the Ak-Chin Indian Community, a recognized public entity – an administrative unit much any other municipality of the State, and the airport is on federal land. The airport is available for GA operations within the operational guidelines (e.g., time, weight, etc.) specified by the sponsors, the Ak-Chin Indian Community. Although the airport encompasses approximately 171 acres on non-trust land, it is owned by the Ak-Chin Indian Community. It was accepted into the NPIAS in 2012 (Site Number 00751.55*A with a three-letter identifier, A39), making it eligible to receive federal grants under the Airport Improvement Program (AIP).

OTHER AIRPORTS

In addition, there are two other GA airports in Pinal County to the east of Maricopa – the Casa Grande Municipal Airport and Coolidge Municipal Airport.

5.7 SOCIOECONOMIC DATA

Although the recent economic downturn resulted in significant social changes, rapid growth over the past decade in Pinal County, the Study Area, and the City of Maricopa is expected to continue with economic recovery. Relatively inexpensive land spurred developers to plan and create large master-planned communities. In response, tens of thousands of people attracted by competitively priced housing and a less hectic lifestyle have made the City of Maricopa their home. However, many of them commute more than 20 miles to work, shopping, and recreating in the Phoenix metropolitan area to the north, as the full complement of supporting commercial and social enterprises have yet to fully develop.

Recently, the City of Maricopa became a member of MAG. MAG's regional jurisdiction for planning, funding, and administrative purposes also encompasses the whole of Maricopa County. Maricopa County adjoins the City's MPA boundary on the west. As the City now is an integral part of MAG, population and employment data are also presented for Maricopa County, as appropriate, to assure continuity of information is maintained between the City and MAG planning efforts. All Year 2014 and projected socioeconomic data were compiled from the MAG Regional socioeconomic data. A detailed listing of existing Year 2014 population, housing, and employment by TAZ is provided in Appendix C.

This section presents estimates of the current or existing population and employment in the Study Area for the most recent year for which comprehensive data is available – 2014.

ESTIMATED 2014 POPULATION & HOUSING

In 2010, the U.S. Census Bureau completed the nation's most recent decennial population survey. The new Census results were used by MAG to update its regional population and employment estimates that support regional planning decisions. The MAG updated database, reflecting Year 2014 estimates, incorporates the City of Maricopa as one of its newest members. Table 5-4 presents key population characteristics for Maricopa County, Pinal County, the Study Area, the Maricopa MPA, and Ak-Chin Indian Community. Maricopa County is fully contained within the boundaries of MAG; whereas, the City of Maricopa is located in Pinal County.

The population of 1,003 persons in the Ak-Chin Indian Community (approximately 10.5 square miles), although centrally located within the MPA, represents a very small portion of the Study Area population. Overall, the 2014 estimated Pinal County population is slightly more than 375,000. The Study Area accounts for close to 60,000 persons or 15.3 percent of the Pinal County population. The geographic distribution of Study Area population, expressed as persons per square mile is graphically displayed in Figure 5-15.

Table 5-4 | Population Characteristics: 2014

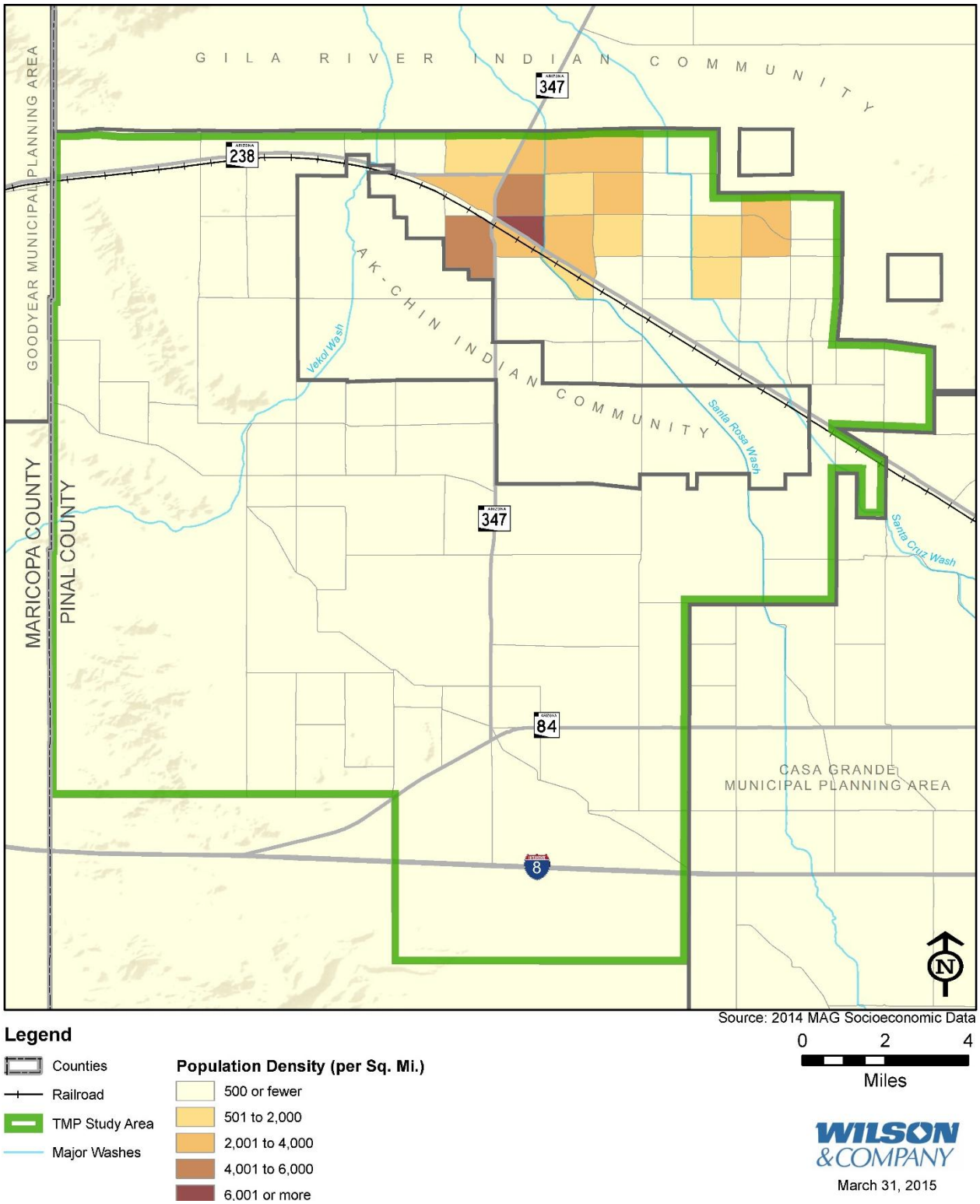
Characteristic	Maricopa County	Pinal County	Study Area*	Maricopa MPA	Ak-Chin Indian Community
Population**	3,933,266	375,743	57,363	56,360	1,003
Dwelling Units (DU)	1,708,755	172,993	22,469	22,182	287
Households (HH)**	1,470,829	134,799	18,918	18,634	284
Persons per DU	2.30	2.17	3.03	2.54	3.49
Persons per HH	2.67	2.79	2.55	3.02	3.53

Prepared by Wilson & Company, February 2015.

* Combined, totals for Maricopa MPA and AK-Chin Indian Community comprise the TMP Study Area.
** Population and household figures exclude persons in transient, seasonal, and group quarters.

Source: 2014 MAG Regional Travel Demand Model Socioeconomic Data. The MAG data set was interpreted to provide the best estimate of the Study Area and Maricopa MPA, which do not coincide with the geographical units used to prepare the model database.

Figure 5-15 | Existing Density of Population in the MPA



Dwelling units (DUs) are actual physical homes quarters (some of which may be vacant); Households (HHs) are familial units occupying the DUs. Pinal County has approximately 173,000 DUs accommodating nearly 135,000 resident households (HHs). The Study Area accounts for slightly more than 22,000 DUs, representing approximately 13 percent of Pinal County DUs. There are 2.17 persons per DU and 2.79 persons per HH in Pinal County. The Study Area contains an estimated 22,469 DUs, including the 287 DUs of the Ak-Chin Indian Community. This results in an average occupancy for the Study Area of 2.55 persons per DU. The approximately 20,000 HHs in the Study Area support an average 3.03 persons.

The data in Table 5-4 reflects the urbanization of the Study Area, primarily occurring within the City of Maricopa. The data reveal a higher number of person per DU and HH relative to Pinal and Maricopa counties, which have large rural and undeveloped areas. The geographic distribution of housing, expressed as DUs per square mile is graphically displayed in Figure 5-16.

ESTIMATED 2014 EMPLOYMENT

MAG also updated employment estimates for its region. The 2014 employment estimates for the same geographic areas presented in the previous section are presented in Table 5-5. The Study Area accounts for approximately 10 percent of the employment in Pinal County and has a similar structure. The Retail sector accounts for the largest share of Study Area employment with the Public sector being close behind. The Study Area accounts for a lower proportional share of county employment in the Office (5.6%) and Industrial (7.5%) sectors. On the other hand, the Study Area contains a larger share of county employment in the Public (10.5%), Other (10.4%), and Non-Site (13%) sectors, and a significantly larger proportional share in the Construction (26.4%) sector. The large representation of the Construction sector is reasonable, given the surge in housing growth over the past several years.

Employment associated with the Ak-Chin Indian Community is largely focused in two areas: Public and Other. These two areas reflect the significant focus and attraction of Harrah's Ak-Chin Casino & Resort and Ultra Star Multi-tainment Center at Ak-Chin Circle as well as extensive agricultural operations operated by the Tribe. The Tribe's operations more than account for the disproportional share of the Public and Other sectors relative to Pinal County. Figure 5-17 illustrates the concentration of employment within the Maricopa MPA.

Figure 5-16 | Existing Density of Dwelling Units in the MPA

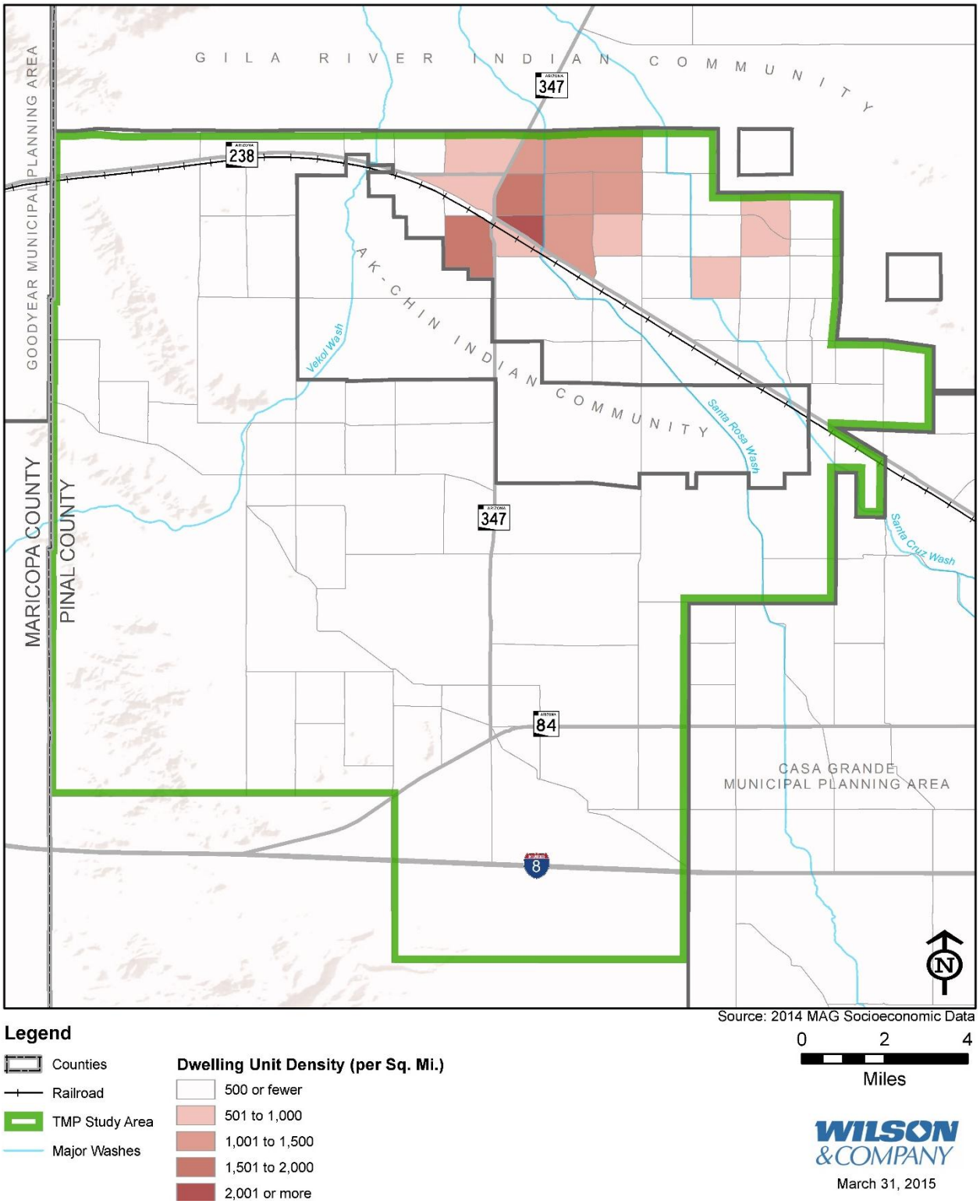


Table 5-5 | Estimated 2014 Employment in the Study Area

Employment Sector	Maricopa County		Pinal County		Study Area		Maricopa MPA		Ak-Chin Indian Community	
	No. of Jobs	Share of All Jobs	No. of Jobs	Share of All Jobs	No. of Jobs	Share of All Jobs	No. of Jobs	Share of All Jobs	No. of Jobs	Share of All Jobs
Retail	411,236	22.0%	22,763	30.4%	2,219	29.7%	2,210	33.8%	9	1.0%
Office	492,764	26.4%	4,397	5.9%	245	3.3%	245	3.8%	0	0.0%
Industrial	356,481	19.1%	6,139	8.2%	461	6.2%	460	7.0%	1	0.1%
Public	141,212	7.6%	20,888	27.9%	2,193	29.4%	1,550	23.7%	643	69.4%
Construction	26,452	1.4%	1,585	2.1%	418	5.6%	418	6.4%	0	0.0%
Work at Home	107,953	5.8%	2,956	3.9%	149	2.0%	133	2.0%	16	1.7%
Non-Site Based*	136,688	7.3%	3,518	4.7%	456	6.1%	438	6.7%	18	1.9%
Other **	193,059	10.3%	12,699	16.9%	1,318	17.7%	1,078	16.5%	240	25.9%
Total Employment	1,865,845	100.0%	74,945	100.0%	7,459	100.0%	6,532	100.0%	927	100.0%

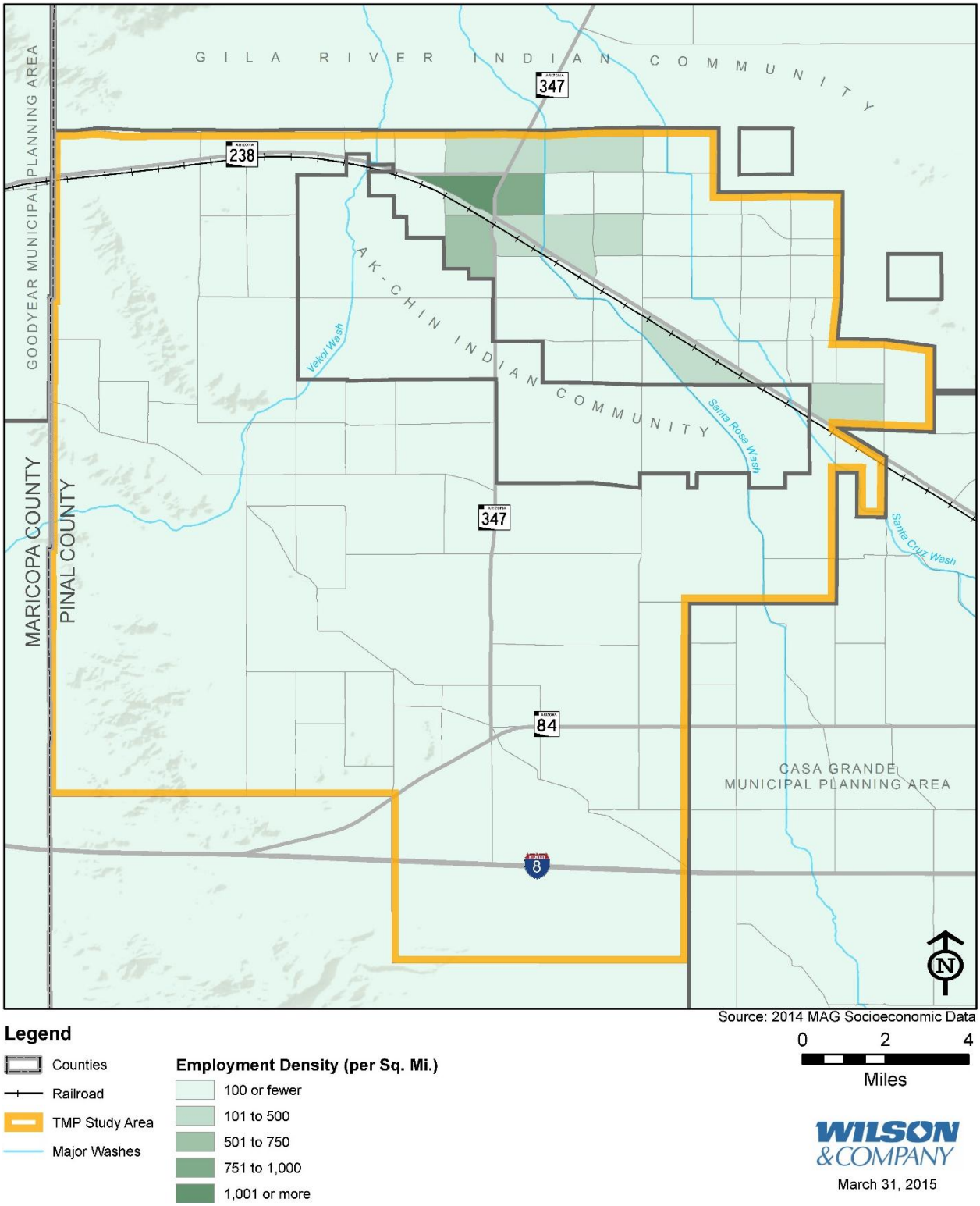
Prepared by Wilson & Company, February 2015.

* Non-Site Employment estimates represent an attempt to determine the number of persons working at locations other than traditional commercial and industrial business facilities (e.g., traveling salespeople).

** Other category includes agriculture, military, mining and other activities not otherwise categorized in the other categories.

Source: 2014 MAG Regional Travel Demand Model Socioeconomic Data. The MAG data set was interpreted to provide the best estimate of the Study Area and Maricopa MPA, which do not coincide with the geographical units used to prepare the model database.

Figure 5-17 | Existing Density of Employment in the MPA



6.0 ROADS & STREETS DESIGN ELEMENT

This chapter provides foundational information regarding the operating status of the existing plus committed roadway network. Between now and the Year 2040, travel within and through the City of Maricopa is anticipated to increase dramatically as the City's population grows and regional interaction increases. In support of anticipated growth and economic development, the City's local and regional transportation system will need to be adapted to changing travel patterns and demand.

Presented in this chapter is a program of recommended roadway improvements developed to provide a rational framework for future transportation decision-making through project selection and the budgeting of available funding. This is accomplished through definition of a staged implementation guide to meet short- and long-range needs.

The following sections provide a review of the roadway network deficiencies and present a listing of recommended network upgrades and corresponding mitigation strategies for addressing the most critical deficiencies. It also presents a phased implementation program for these roadway network improvement projects for the Years 2020, 2030, and 2040. These years essentially represent near-term, mid-term, and long-term improvements that can be scheduled for construction.

6.1 FORECAST OF FUTURE DEVELOPMENT ACTIVITY

A forecast of future conditions was developed to permit evaluation of the Base Future Roadway Network. The Base Future Roadway Network reflects existing roadways and other transportation elements committed to development through currently programmed actions. This forecast involved establishing the anticipated pattern and density of land uses in the Study Area, which permitted an estimate of travel demand on the Base Future Roadway Network.

CITY OF MARICOPA 2040 VISION STRATEGIC PLAN

The *City of Maricopa 2040 Vision Strategic Plan* adopted May 5, 2015, was designed to "…challenge and stretch the community's imagination and commitment to creating a "best, great and exciting," rather than a "good enough" future." It stands as blueprint for positive change and progress derived through a community-based definition of key issues and recommendations for the future. The plan also provides guidance for the development of other more specific plans focused on achieving more narrowly defined goals and objectives. A key aspect of the plan is the adoption of the "Smart City" initiative, which refers to the application of technology to create a more efficient and higher performing infrastructure that will effectively contribute to community well-being, reduced costs, and resource conservation.

The Land Use Element of the *City of Maricopa 2040 Vision Strategic Plan* focuses on creating a carefully planned and well-designed community that fosters quality growth and development. Several aspects have direct bearing on the future of transportation services.

- One is the intention to incorporate regional transportation planning, transportation policies, and recommendations of the PTOS into the community *General Plan*.
- Another is the intention to encourage development of regional commercial and retail centers along major transportation corridors, while assuring an appropriate mix of large-scale centers and small-scale convenience and neighbourhood shopping opportunities.
- A third aspect of the Land Use element includes evaluation of annexation opportunities, which specifically gives emphasis to the need to create efficient "loop parkways" to improve community

and regional connectivity and mobility. Specific attention is given to incorporating land south and west of the Ak-Chin Indian Community, where the potential I-11 corridor has been identified.

- The importance of establishing adequate transportation corridors to enhance the community's ability to attract high-tech and high-value industrial enterprises supports the desire for quality employment opportunities.
- Finally, the Vision stresses the need to assure land use policies and objectives are compatible with developing effective transportation corridors that are consistent with the community's General and Master Plans.

The Transportation Element of the *City of Maricopa 2040 Vision Strategic Plan* stresses the desire to create an "…integrated, citywide, regional, and multimodal transportation system that is safe, functional and integrated with the Smart Cities Initiative." Important strategies particularly relevant to this ATP focus on improving connectivity with the Phoenix metropolitan area, including the pursuit of additional Express Bus service, Park-and-Ride opportunities, high-capacity transit services (e.g., Commuter Rail and/or LRT), and establishing strategic regional transportation partnerships. More internally focused are strategies to create a roadway network does not have congestion issues, is capable of fostering future growth, and is compatible with expectations for the land use pattern. Specific strategies in the plan already are being implemented, including: development of this ATP and a TMP; preliminary delineation of truck routes (originally defined in the 2008 RTP Update); and planning and design actions for grade separation of SR 347 at the UPRR.

The Transportation Element also supports establishing connectivity with other areas within Pinal and Maricopa counties. Future east-west travel corridors are envisioned, as well as the potential to create a north-south alternative to SR 347. The Element, in addition, does not ignore the desire of the community to "…create safe and functional pedestrian ways and bicycle routes…" that can foster greater individual mobility, adding to the health of citizens, building community cohesion, relieving congestion, and increasing economic interaction. Connectivity of the bicycle routes, in particular, is viewed as instrumental in supporting mobility options for all commercial and population centers.

FUTURE LAND USE PATTERNS

The City of Maricopa *General Plan* enforced today was adopted in 2006. It includes a Land Use Element that guides new development and redevelopment within the City Limits and MPA. The Land Use Element is used to designate the location, extent, density, and intensity of privately- and publicly-owned land. The *General Plan* indicates the community will continue to grow and develop from what was once an agricultural service center into a modern urbanized area supporting new, rapidly expanding residential and commercial developments. The State of Arizona requires communities to update General Plans every 10 years; therefore, the City of Maricopa now is engaged in the updating process. Thus, some information presented in this chapter may be modified or superseded with the findings, conclusions, and recommendations deriving from the 2016 *General Plan* update. Nevertheless, the most currently available information regarding the community's projected growth pattern has been evaluated and is presented herein as guidance for analyzing future transportation needs.

The types and densities of future land uses within the MPA are identified in the *General Plan*. The *General Plan* Land Use Element builds upon the existing land use patterns and emphasizes housing diversity, employment, and service sectors. Significant land use changes include:

- Employment land uses are concentrated along MCGH/Union Pacific corridor, SR 238, and Ak-Chin Regional Airport area;
- Residential growth is allocated to areas east and south of the Old Town as well as west of SR 347/John Wayne Parkway; and
- Identified Special Planning Areas include the Old Town Redevelopment Area, Seven Ranches Area, Volkswagen Test Facility, and Arizona State Land Development Section 16. Each is further described below:
    - **Historic District Redevelopment Area** – Located at the heart of historic Maricopa, this area is proposed for mixed-use redevelopment, including specialty shopping, dining, other retail and tourist-based activities. The Historic District Redevelopment Area Plan reflects the original redevelopment plan created for "Old Town" in 2009. This current rendering illustrates the proposed land use pattern for Old Town (Figure 6-1).
    - **Seven Ranches Area** – The *Seven Ranches Area Plan* was developed in 2012 focusing on land bordered by Honeycutt Road, W. Santi Road, Porter Road, and White & Parker Road. It establishes a plan for the consolidation of smaller parcels to foster orderly redevelopment, including low-density residential for smaller parcels and non-residential development for consolidated parcels. This plan ultimately provided three scenarios with low-, medium-, and high-value development actions.
    - **Volkswagen Test Facility** – Currently located between Murphy Road, Indian Route 97, Farrell Road, and Smith-Enke Road, the Volkswagen Proving Grounds is likely to be relocated sometime in the future. Decisions regarding the future of this facility are pending. After the test facility is relocated, a 1,600-acre tract of land targeted for future employment developments will become available.
    - **Arizona State Land Development Section 16** – Located west of SR 347 and north of SR 238, this area is anticipated to support development of "vital community functions," including employment, training, higher education, and commerce. Secondary support uses would include high-density residential and community open spaces.

The Future Land Use Map from the 2005 *General Plan* is illustrated in Figure 6-2.

6.2 AREA GROWTH ASSUMPTIONS

Population and employment growth is the driving force behind increases in travel demand. To understand the potential need for transportation facilities and required capacity to meet expected demand, population and employment projections are prepared. Projections provided in this section were developed for the MAG region and constituent governmental members following adjustments associated with results obtained through the 2010 U.S. Census. The projections are based on statewide projections prepared by the ADOA to serve as the basis for administering various programs supported by the State, including transportation improvement programs.

BACKGROUND FOR PROJECTIONS

Projections for communities within Pinal County were adopted in conjunction with the recently completed CAG RTP, which focused on growth and development within Gila and Pinal counties. The City of Maricopa opted to redistribute future population, housing, and employment demographics within the framework of the CAG RTP regional travel demand modeling effort. The City's redistribution was based on city official's

Figure 6-1 | 2009 Redevelopment Area Plan Proposal Land Use Map

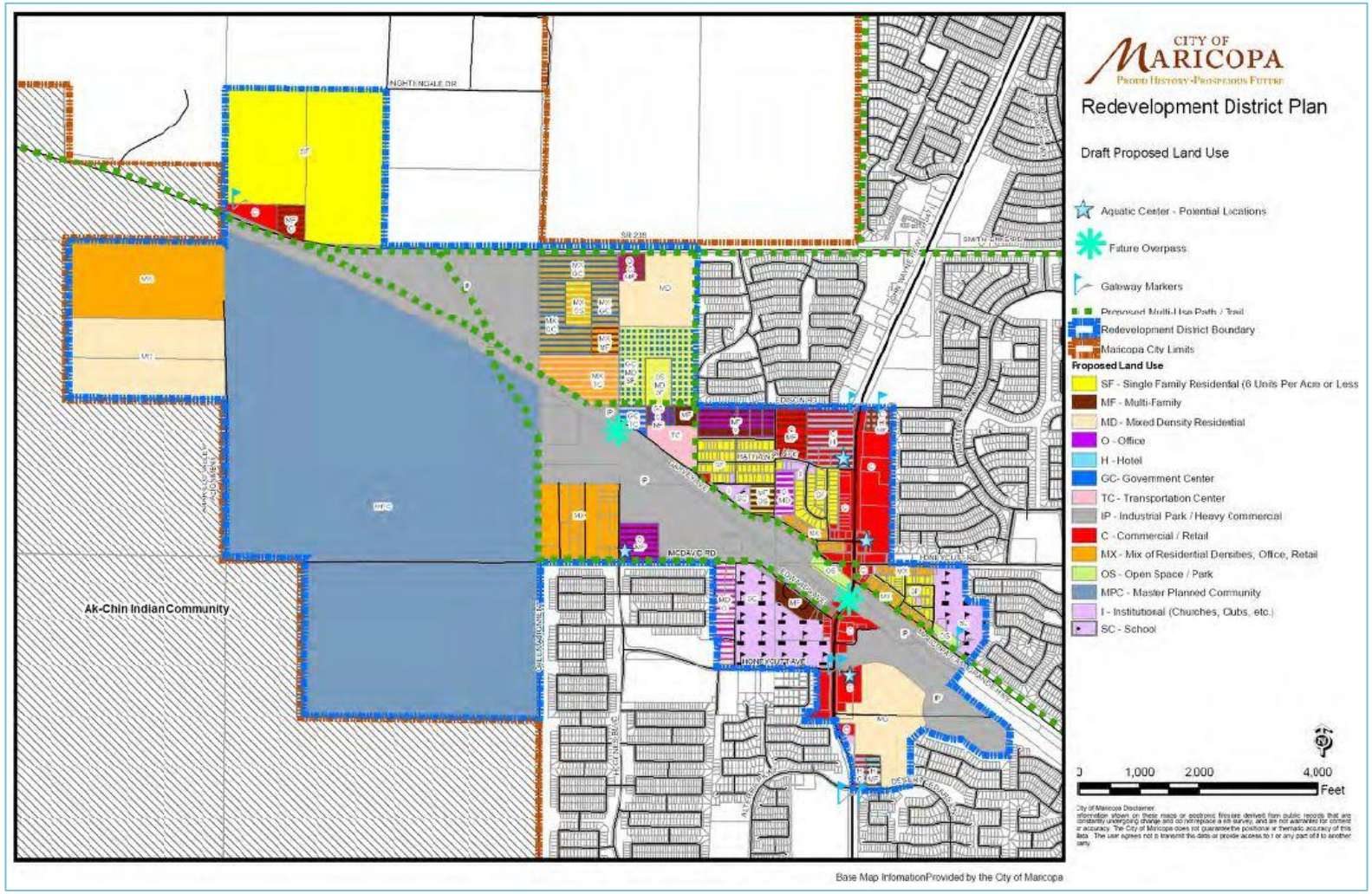
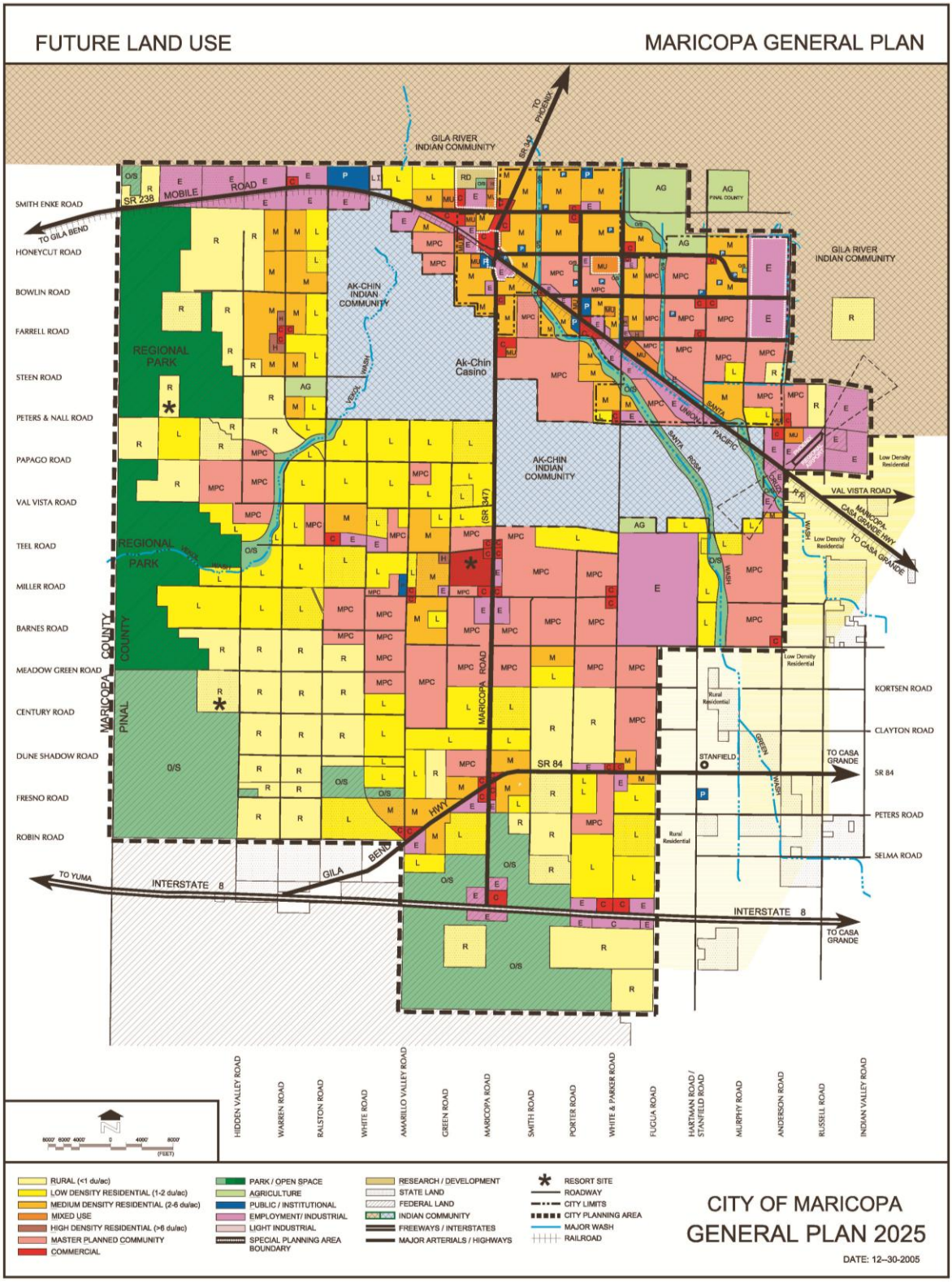


Figure 6-2 | 2005 General Land Use Map



contemporary understanding of community growth dynamics and where development likely will occur throughout the MPA. The redistribution of population and employment was adopted within the framework of the CAG RTP, incorporated into the MAG Regional TDM, and utilized for this study. All 2014 and projected socioeconomic data relating to future travel demand were compiled from the MAG model. Growth rate projections for the MPA are displayed in Figure 6-3 (A-D).

The growth rates of population (Figure 6-3A) and housing (Figure 6-3B) are comparable between now and 2040, both showing the greatest percent change occurring between years 2020 and 2030. Employment growth (Figure 6-3C) is expected to occur at a slower rate than population and housing growth, which reflects the community's continued reliance on the Phoenix metropolitan area and other locations for jobs. The greatest growth in employment is projected to occur between 2030 and 2040. In addition to determining the growth rates for population, employment, and housing, an understanding of the rate of construction for DUs is useful in understanding the anticipated rate of growth in the community. Figure 6-3D presents a graphic interpretation of the average rate of construction of residential DUs. This chart indicates the City should anticipate construction of approximately 47 DUs per month through the Year 2020. Between 2020 and 2040, the rate of construction of DUs is projected to double to approximately 96 and 101 DUs per month.

The charts also show the expectation for growth relative to a condition referred to Buildout of the MPA. Significant employment growth is projected to occur between the Year 2040 and Buildout, reflecting the longer time frame for this condition to manifest. For the purpose of the TMP, anticipated growth occurring between now and the Year 2040 will be most relevant for examining transportation system deficiencies and determining how quickly to implement transportation changes. An assessment of the Buildout condition has been prepared in conjunction with the RCP, which has a larger geographic focus. This assessment is presented in Chapter 12 of this ATP. It is supported by population, housing, and employment projections prepared specifically for the Buildout condition.

DETAILED DEMOGRAPHIC PROJECTIONS

This section presents an assessment of the expected future population and employment growth as developed for the MAG region and constituent governmental members. Refer to Appendix C for a detailed listing of population, housing, and employment projections by TAZ for Years 2020, 2030, and 2040.

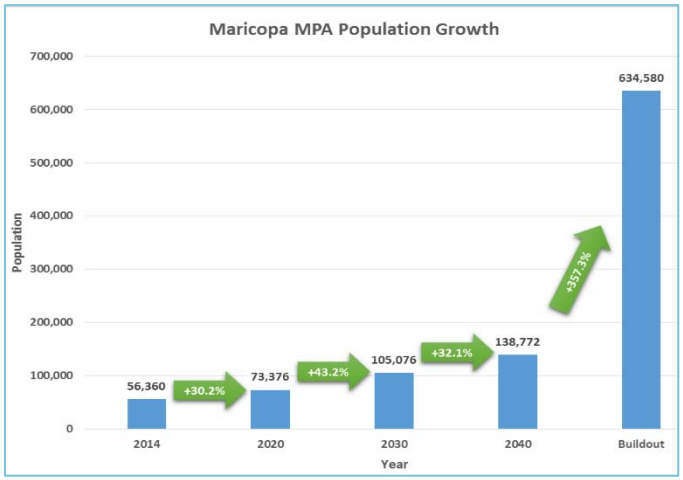
PROJECTED POPULATION & HOUSING

Pinal County and the City of Maricopa are centrally located in the emerging megapolitan area referred to as the Sun Corridor, which represents a large emerging socioeconomically interdependent area occupying much of the state connecting the Arizona-Mexico border area in the south with Tucson, Phoenix, and Prescott in the north (Figure 6-4). The CAG RTP states "the merging of social, economic, and transportation ties and resources within the Arizona Sun Corridor will directly affect a large portion of Pinal County and communities within … the county." This growth will present significant challenges regarding the future management of the city, county, and state transportation systems.

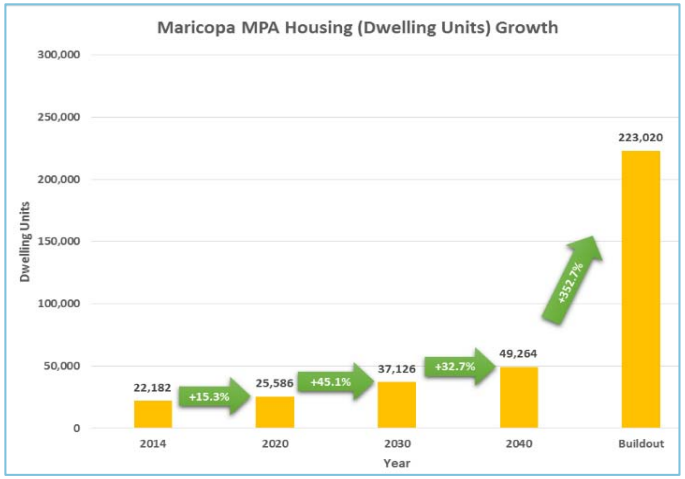
Figure 6-5 provides a graphic illustration of the expectations for growth in the Sun Corridor, as developed by MAG. The red concentrations depict the extent of growth associated with the Sun Corridor's urbanized areas. The surrounding color represents the full extent of anticipated population growth in suburban areas that lead to the expectation of continuity from Nogales to Prescott. Phoenix and Tucson are the principal metropolitan areas that are expected to foster a comprehensive, interconnected economic, social,

Figure 6-3 | Demographic, Housing, and Employment Projections for the MPA

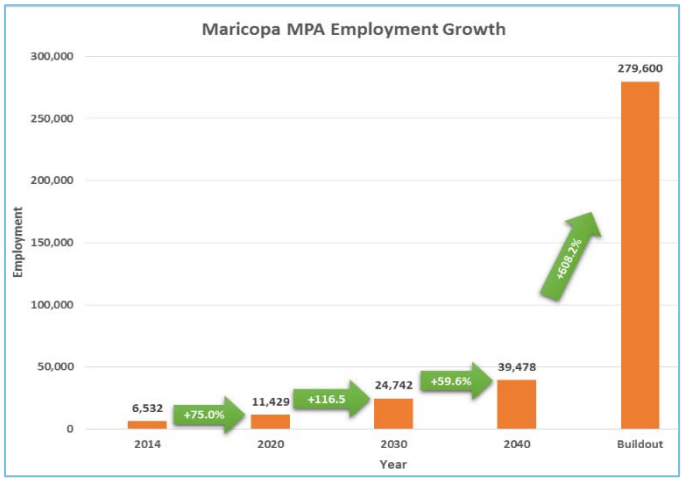
A



B



C



D

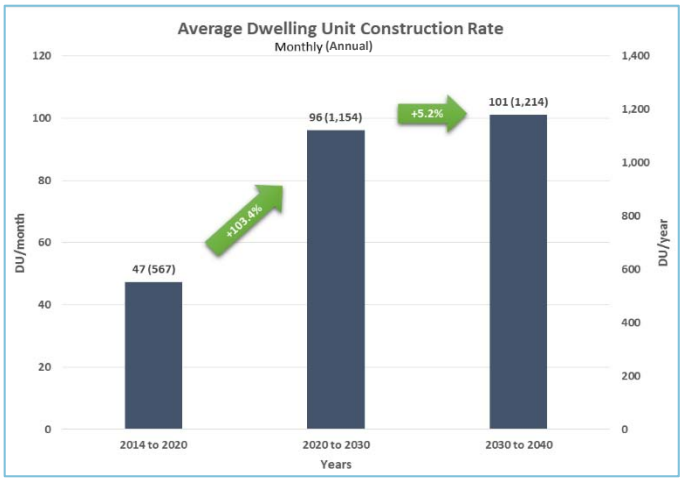
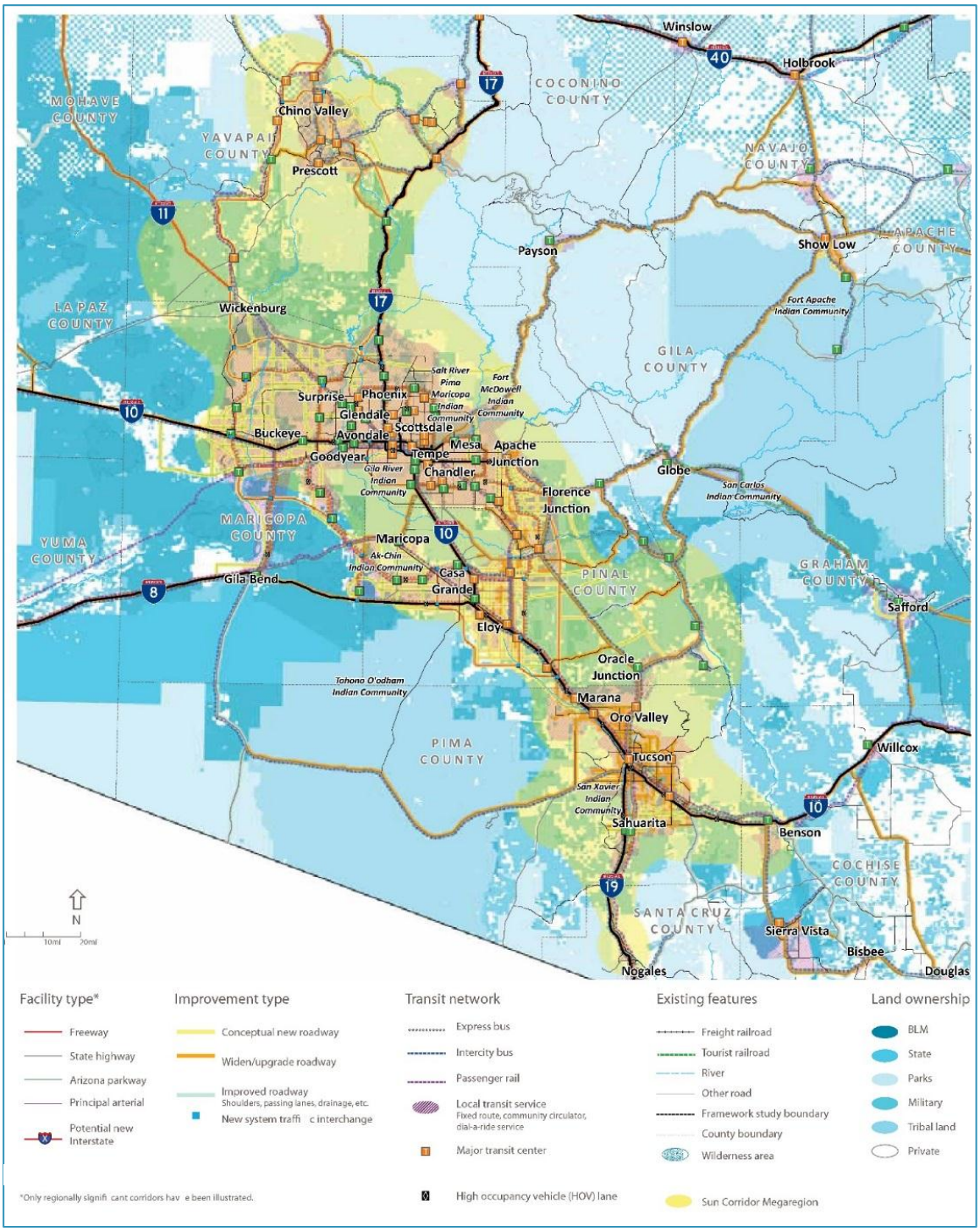
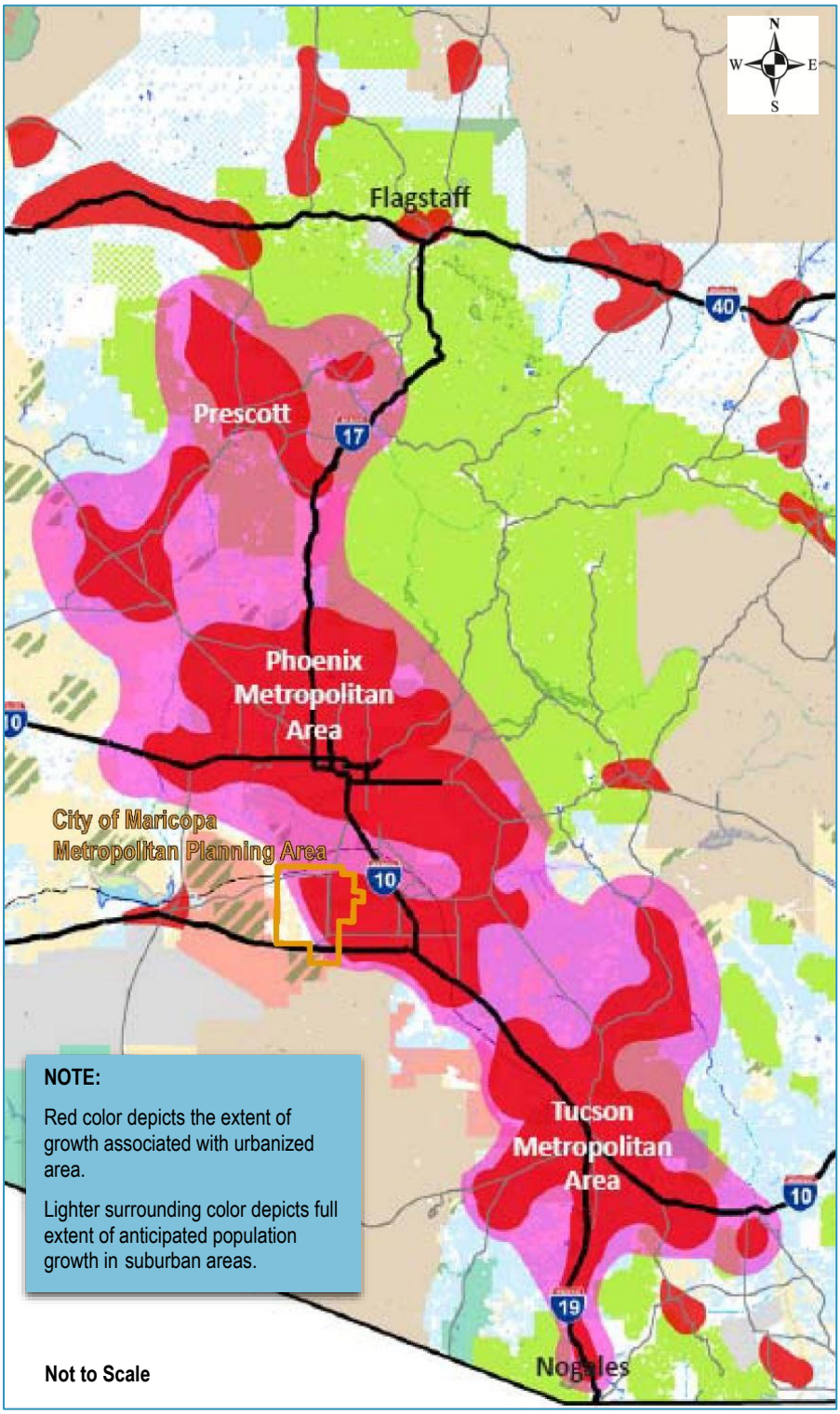


Figure 6-4 | Geographic Extent of Arizona's



Source: Figure 20, Statewide Transportation Planning Framework, in Phoenix-Tucson Ambitions Report, Suncorridor, Future Corridor, *A Global Megaregion in the 21st Century*, AECOM Global Cities Institute, 2010.

Figure 6-5 | Anticipated Development of Arizona's Sun Corridor



Source: Maricopa Association of Governments (MAG).

environmental, land use, and multimodal transportation system that will support economic growth and high quality of life.

Due to its geographic location and the dynamics of megapolitan growth anticipated as the Sun Corridor matures, the population projections indicate an expectation of expansive growth in Pinal County, as shown in Table 6-1. Figure 6-6 provides a graphic illustration of the projected population density for the Year 2040. Figure 6-7 shows a similar illustration of Year 2040 distribution of DUs for the Study Area.

Table 6-1 | Projected Population Characteristics: 2040

Characteristic	Maricopa County	Pinal County	Study Area	Maricopa MPA	Ak-Chin Indian Community
Population	6,075,935	888,427	139,944	138,772	1,172
% Change 2014 to 2040	54.5%	136.4%	144.0%	146.2%	16.8%
Dwelling Units (DU)	2,421,543	361,906	49,650	49,264	386
% Change 2014 to 2040	41.7%	109.2%	121.0%	122.1%	34.5%
Households (HH)	2,265,740	323,389	46,295	45,952	343
% Change 2014 to 2040	54.0%	139.9%	144.7%	146.6%	20.8%
Persons per DU	2.51	2.45	2.82	2.82	3.04
% Change 2014 to 2040	9.0%	13.0%	10.4%	10.9%	-13.1%
Persons per HH	2.68	2.75	3.02	3.02	3.42
% Change 2014 to 2040	0.3%	-1.4%	-0.3%	-0.2%	-3.3%

Prepared by Wilson & Company, February 2015.

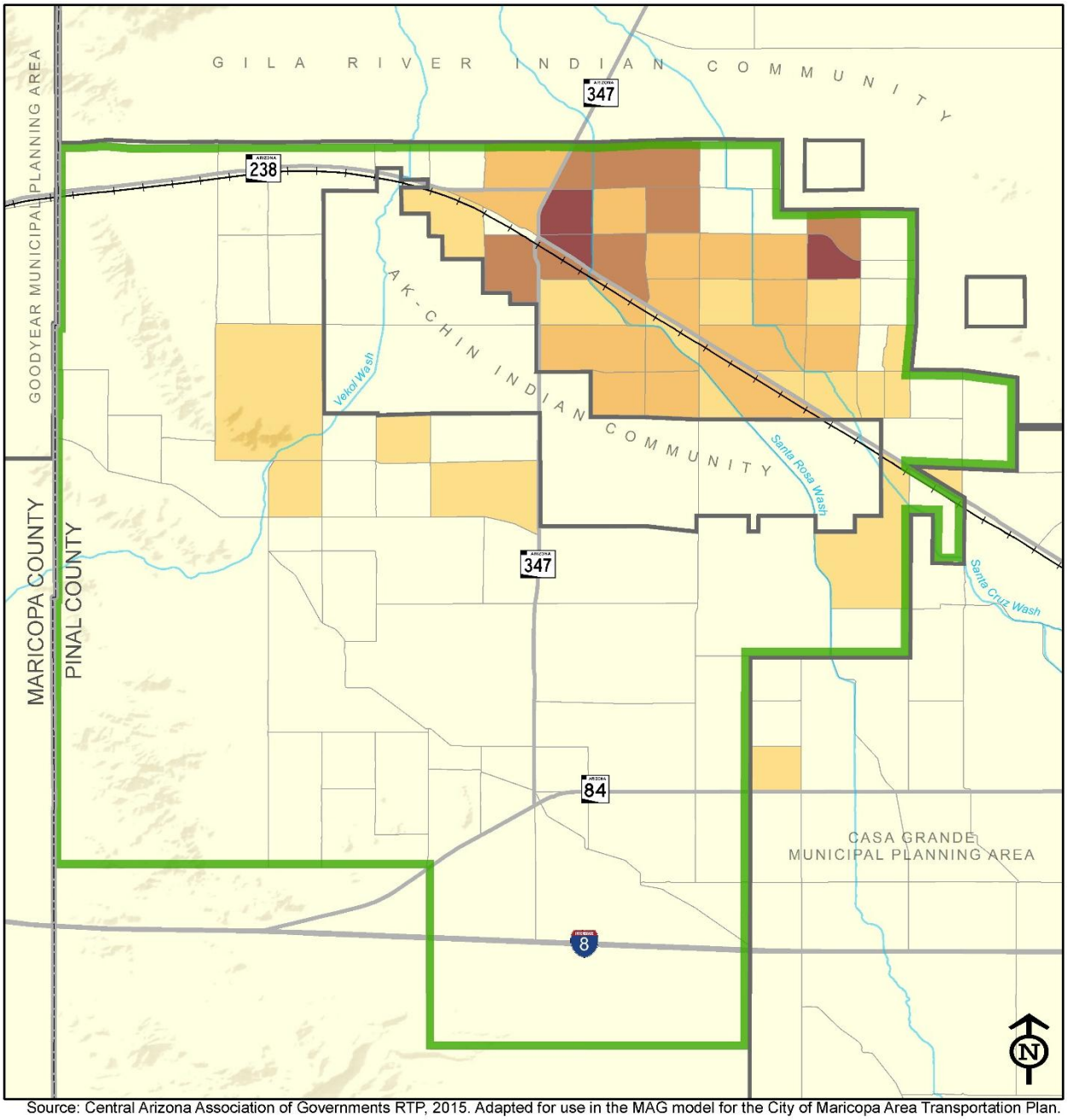
Source: Maricopa Area Transportation Plan Travel Demand Model based on 2040 MAG Regional Travel Demand Model Socioeconomic Data. The MAG data set was interpreted to provide the best estimate of the Study Area and Maricopa MPA, which do not coincide with the geographical units used to prepare the model database.

PROJECTED EMPLOYMENT

Projections of employment are much more difficult than projections of population, because each employment sector (e.g., retail, office, industrial, etc.) is influenced by many factors. The retail sector, characterized by direct consumption, is impacted directly by market forces and bank rates. Office employment is influenced heavily by the the size and type of service actvities demanded by and offered in a community. Industrial and manufacturing activities may be affected by the availability of raw resources and competition from overseas, particularly in developing countries with low labor rates. Agriculture is directly impacted by government policies and land use dynamics.

Table 6-2 shows 2040 employment projections for Maricopa County, Pinal County, the Study Area, Maricopa MPA, and the Ak-Chin Indian Community. These projections were recently adopted in conjunction with a regional planning effort conducted for Pinal and Gila counties, and subsequently adopted by MAG into its Regional TDM. Table 6-2 reveals explosive growth in employment in Pinal County and the City of Maricopa would be expected to follow expectations of growth relative to the Sun Corridor, as discussed in the previous section (refer to Figure 6-4 and Figure 6-5).

Figure 6-6 | Projected 2040 Population Density



Source: Central Arizona Association of Governments RTP, 2015. Adapted for use in the MAG model for the City of Maricopa Area Transportation Plan.

Legend

- Counties
- Railroad
- TMP Study Area
- Major Washes

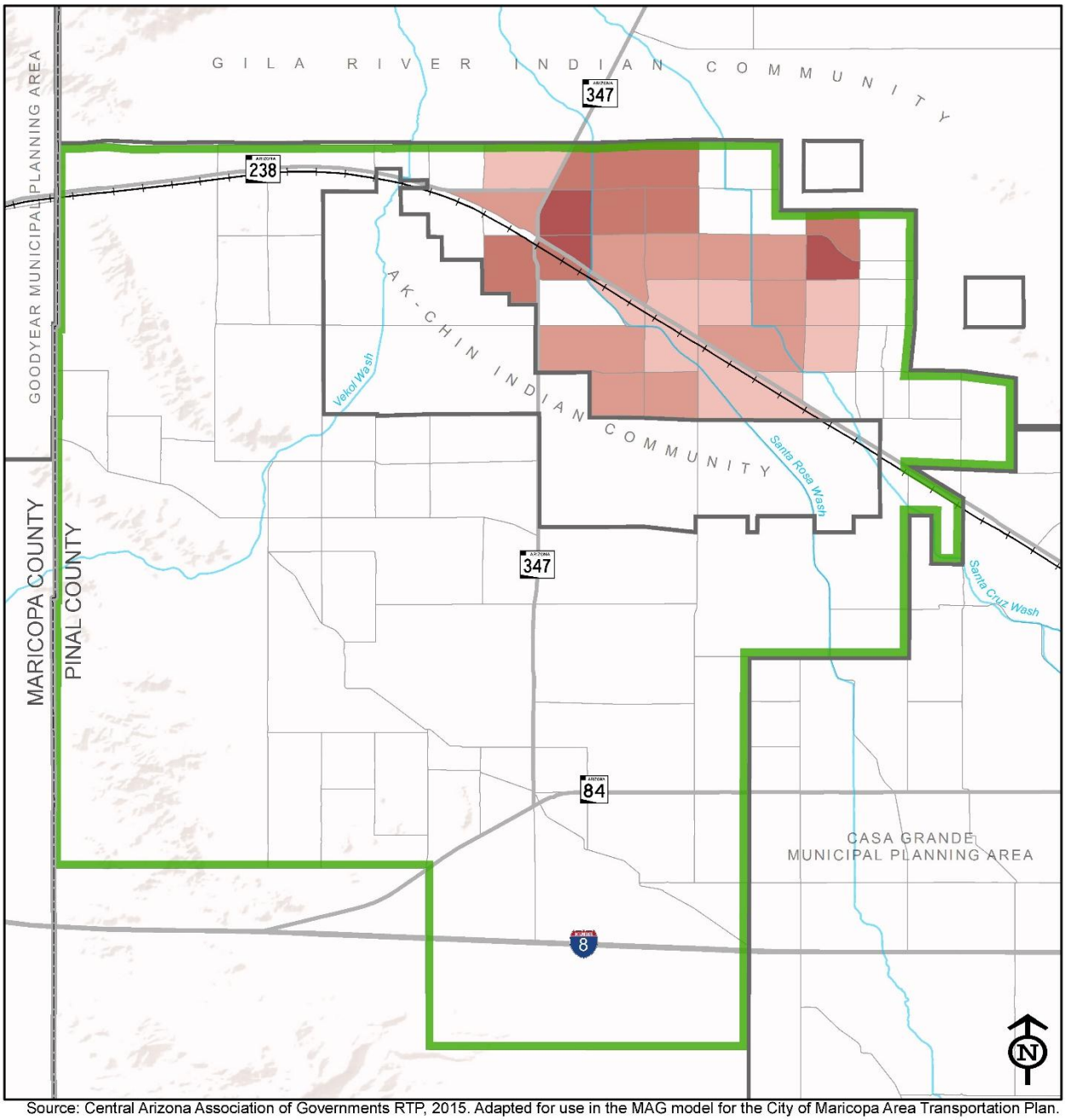
Population Density (per Sq. Mi.)

- 500 or fewer
- 501 to 2,000
- 2,001 to 4,000
- 4,001 to 6,000
- 6,001 or more

0 2 4
Miles

Prepared by:
WILSON & COMPANY
March 31, 2015

Figure 6-7 | Projected 2040 Dwelling Unit Density



Source: Central Arizona Association of Governments RTP, 2015. Adapted for use in the MAG model for the City of Maricopa Area Transportation Plan.

Legend

- Counties
- Railroad
- TMP Study Area
- Major Washes

Dwelling Unit Density (per Sq. Mi.)

- 500 or fewer
- 501 to 1,000
- 1,001 to 1,500
- 1,501 to 2,000
- 2,001 or more

0 2 4
Miles

WILSON & COMPANY

March 31, 2015

Table 6-2 | Projected Employment Characteristics: 2040

Employment	Maricopa County	Pinal County	Study Area	Maricopa MPA	Ak-Chin Indian Community
Retail	685,135	117,051	17,221	17,128	93
% Change 2014 to 2040	66.6%	414.2%	676.1%	675.0%	933.3%
Office	912,435	33,729	6,329	6,323	6
% Change 2014 to 2040	85.2%	667.1%	2483.3%	2480.8%	600.0%
Industrial	583,727	26,962	2,674	2,646	28
% Change 2014 to 2040	63.7%	339.2%	480.0%	475.2%	2700.0%
Public	243,277	78,707	9,825	8,579	1,246
% Change 2014 to 2040	72.3%	276.8%	348.0%	453.5%	93.8%
Construction	40,187	3,621	405	403	2
% Change 2014 to 2040	51.9%	128.5%	-3.1%	-3.6%	200.0%
Work at Home	183,454	12,793	662	644	18
% Change 2014 to 2040	69.9%	332.8%	344.3%	384.2%	12.5%
Non-Site Based	207,650	16,157	2,194	2,127	67
% Change 2014 to 2040	51.9%	359.3%	381.1%	385.6%	272.2%
Other	240,892	25,817	2,237	1,628	609
% Change 2014 to 2040	24.8%	103.3%	69.7%	51.0%	153.8%
Total Employment	3,096,757	314,837	41,547	39,478	2,069
% Change 2014 to 2040	66.0%	320.1%	457.0%	504.4%	123.2%

Prepared by Wilson & Company, February 2015.

*** Non-Site Employment estimates represent an attempt to determine the number of persons working at locations other than traditional commercial and industrial business facilities (e.g., travelling salespeople).**

**** Other category includes agriculture, military, mining and other activities not otherwise categorized in the other categories.**

Source: Pinal County Employment Projections reported in the Draft CAG Regional Transportation Plan (2014), derived from Arizona Department of Administration (ADOA) population projections and Sun Corridor jobs/person ratio.

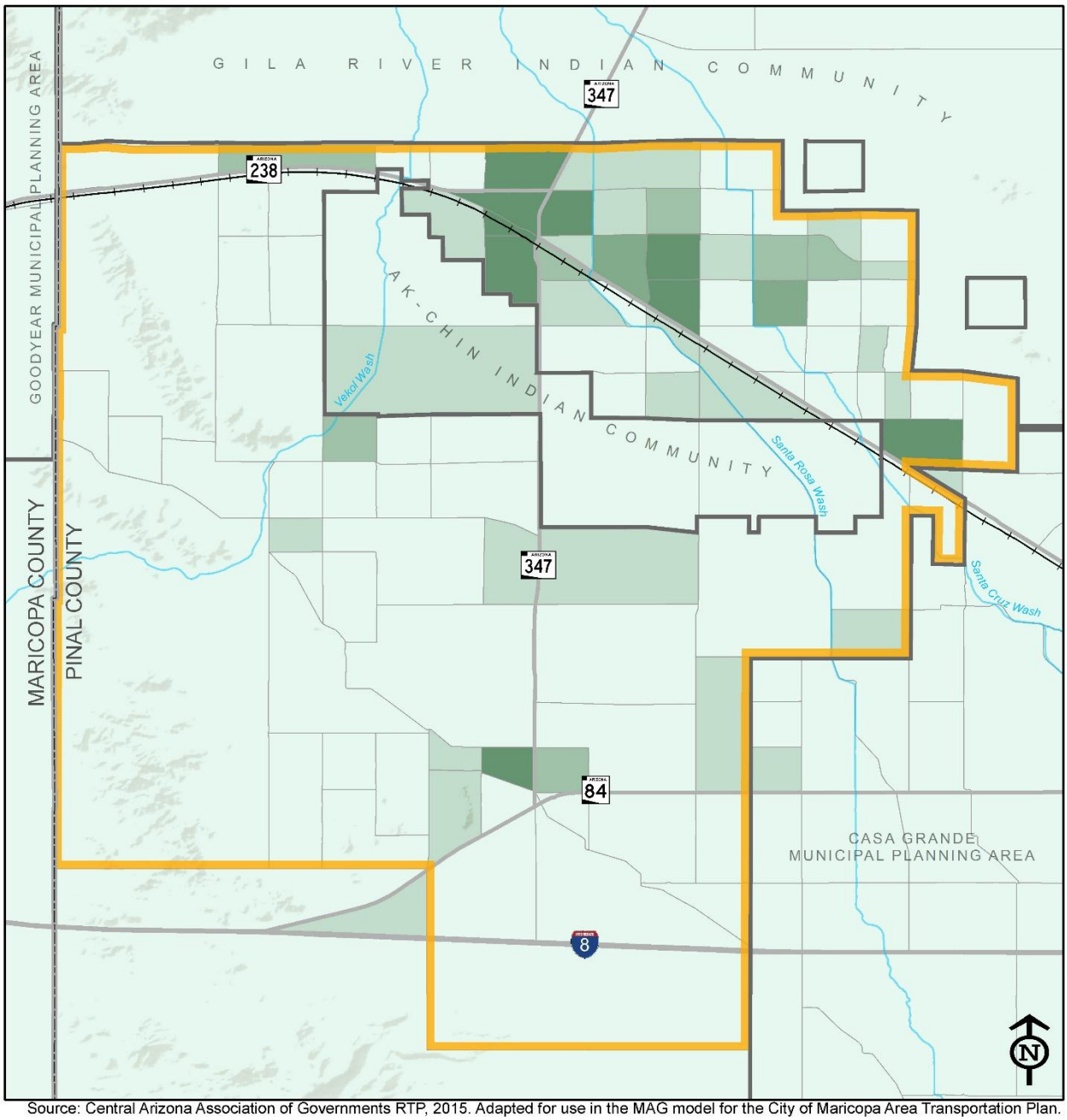
Projections indicate employment in the Year 2040 in Pinal County will be more than four times greater than current levels. The employment base in the City of Maricopa is projected to increase almost six times current levels (compare with Table 5-5). The largest increase for the Study Area is projected to occur in the Office sector, which will see employment estimated currently at 245 (refer to Table 5-5) to be over 6,300 jobs. Year 2040 projected employment density in the Study Area is graphically depicted in Figure 6-8.

6.3 IDENFITICATION OF ROADWAY NETWORK NEEDS

The purpose of this section is to present travel forecasts developed for the Study Area's future roadway network as it is expected to evolve through the planning horizon of 2015-2040. Future-year traffic forecasts were developed separately for the Buildout condition, using modified data sets from the MAG Regional TDM (refer to Chapter 12, Regional Connectivity Plan). The MAG model permits planners to store, display, manage, and analyze projected socioeconomic data to evaluate and forecast travel demand.

Information presented in this section focuses on traffic assignments applied to the E+C Roadway Network. Traffic assignments reported in this chapter were developed through application of the MAG Regional TDM

Figure 6-8 | Projected 2040 Employment Distribution



Source: Central Arizona Association of Governments RTP, 2015. Adapted for use in the MAG model for the City of Maricopa Area Transportation Plan.

Legend

- Counties
- Railroad
- TMP Study Area
- Major Washes

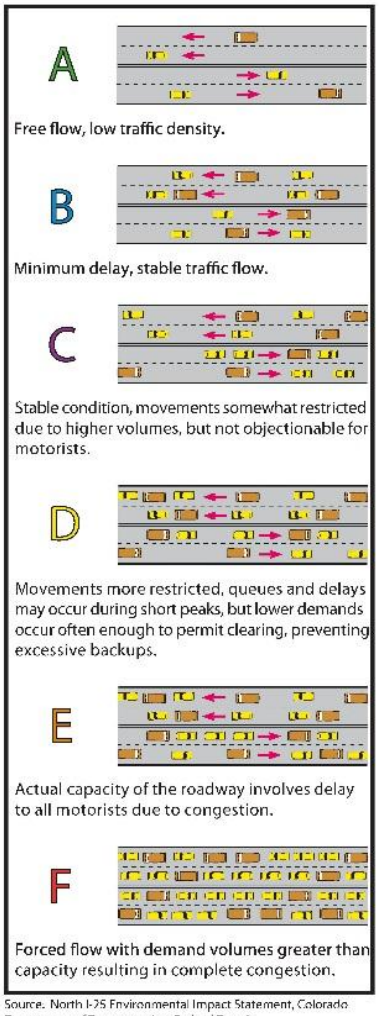
Employment Density (per Sq. Mi.)

- 100 or fewer
- 101 to 500
- 501 to 750
- 751 to 1,000
- 1,001 or more

0 2 4
Miles

WILSON & COMPANY
March 31, 2015

and are based on growth projections of households and employment presented in Section 6.2 (refer to Appendix C for Year 2020, 2030, and 2040 projections). The E+C Roadway Network, as described in Section 5.1, is used to provide a basis for identifying potential future roadway network deficiencies, if no other improvement projects are programmed, funded, and implemented. Traffic assignments based on projected socioeconomic data reveal where roadway network deficiencies potentially may exist based on forecasted travel demand. The assignments also serve as a basis for testing and evaluating different network improvement scenarios to alleviate or mitigate the deficiencies.



Source: North I-25 Environmental Impact Statement, Colorado Department of Transportation/Federal Transit Administration/Federal Highway Administration, August 17,2008.

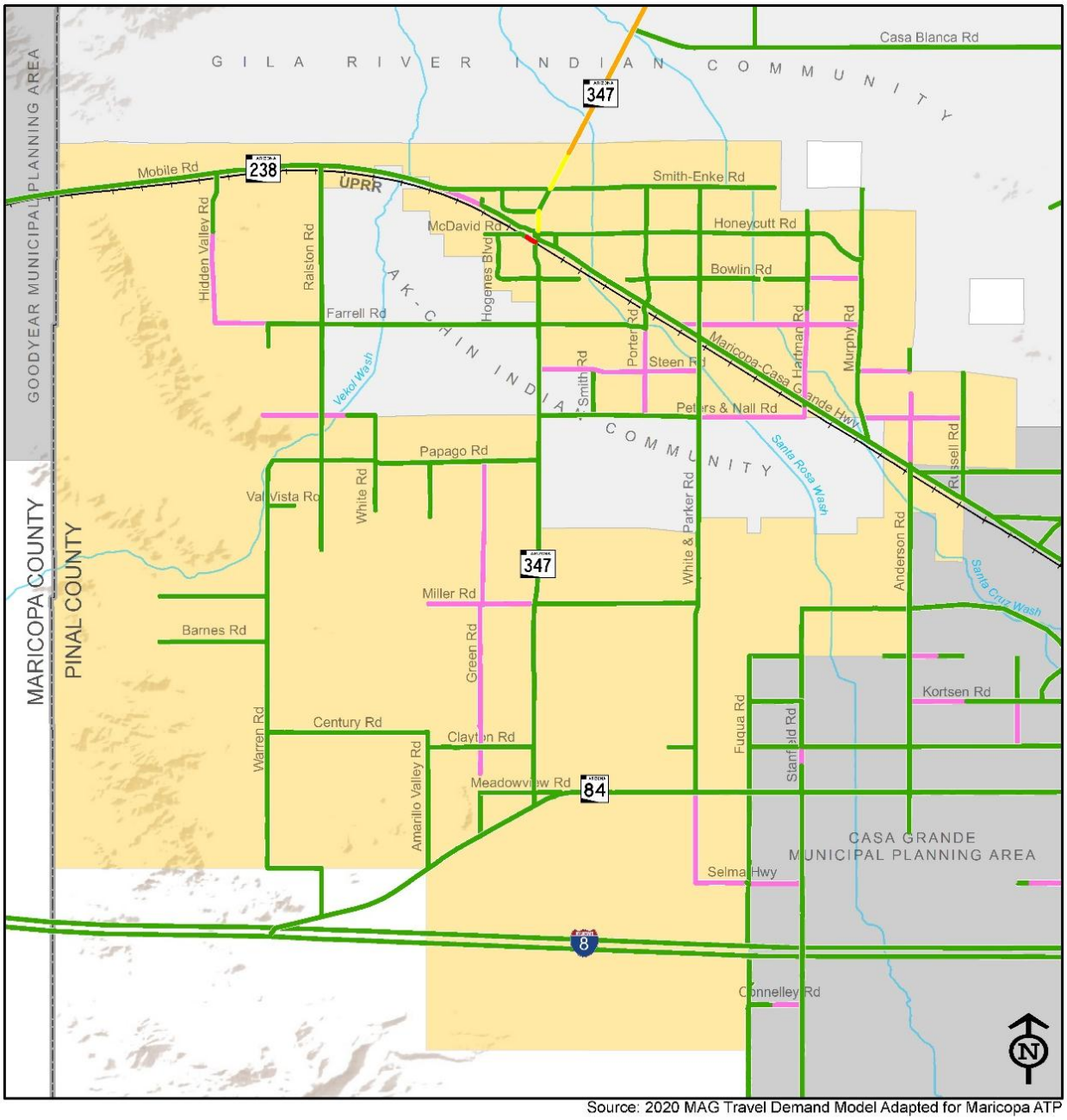
Major facilities forming the E+C Roadway Network were evaluated to determine potential future operating conditions on Study Area facilities, which is measured in terms of level of service (LOS). Most simply, LOS refers to a standard measurement used by transportation officials to reflect the relative ease of traffic flow, i.e., volume of traffic relative to design capacity of the roadway. A scale of A to F has been adopted, with free-flow being rated LOS A and heavily congested conditions rated as LOS F (see graphic illustration at right).[15]

Future LOS of E or F conditions have been identified for each of three planning horizons – Year 2020 (Figure 6-9), Year 2030 (Figure 6-10), and Year 2040 (Figure 6-11). Figures 6-9 through 6-11 reveal LOS on long stretches of regionally significant roads is expected to be deficient in the future. Five key roadways with forecasted deficiencies in Year 2040 are: SR 347, Smith-Enke Road, Honeycutt Road, MCGH, and Papago Road. In addition, several other short segments of important roadways within the central core of the City are expected to be at LOS E or F. A detailed analysis of LOS for all major facilities that form the MPA's E+C network is provided in Appendix D.

The E+C Roadway Network modeling process aids in identifying the potential need for facility upgrades to mitigate anticipated deficiencies. The process permits evaluation of upgrades, such as paving unpaved roads, and also facilitates examination of possible future system improvements, such as widening roadways, constructing new roadways, creating connections between existing roadways, and implementing improvement projects that are programmed but not yet funded. Based on the analysis results and discussion with City staff and project stakeholders, Table 6-3 identifies deficient E+C Roadway Network facilities and notes recommended mitigation strategies. These facilities were tested through application of the MAG Regional TDM, which assisted the refinement process for these initial conclusions and identification of specific recommendations for improvement.

[15] The **E+C** network is referred to as the Future Base Roadway Network for the Year 2040 (Base Network). That is to say, this would be the roadway network of the future should no other improvements be programmed and funded. **LOS E** is characterized by volumes approaching or meeting the roadway capacity. This condition results in slow speeds and higher delays. At **LOS F**, demand for travel on the road has exceeded the capacity, resulting in forced flow conditions. Due to the congestion, motorists experience extremely slow speeds and excessive delays.

Figure 6-9 | Year 2020 Level of Service: Base Network (E+C) Conditions



Source: 2020 MAG Travel Demand Model Adapted for Maricopa ATP

Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area

Level of Service

- LOS A-C
- LOS D
- LOS E
- LOS F
- Paving Required

0 2 4
Miles

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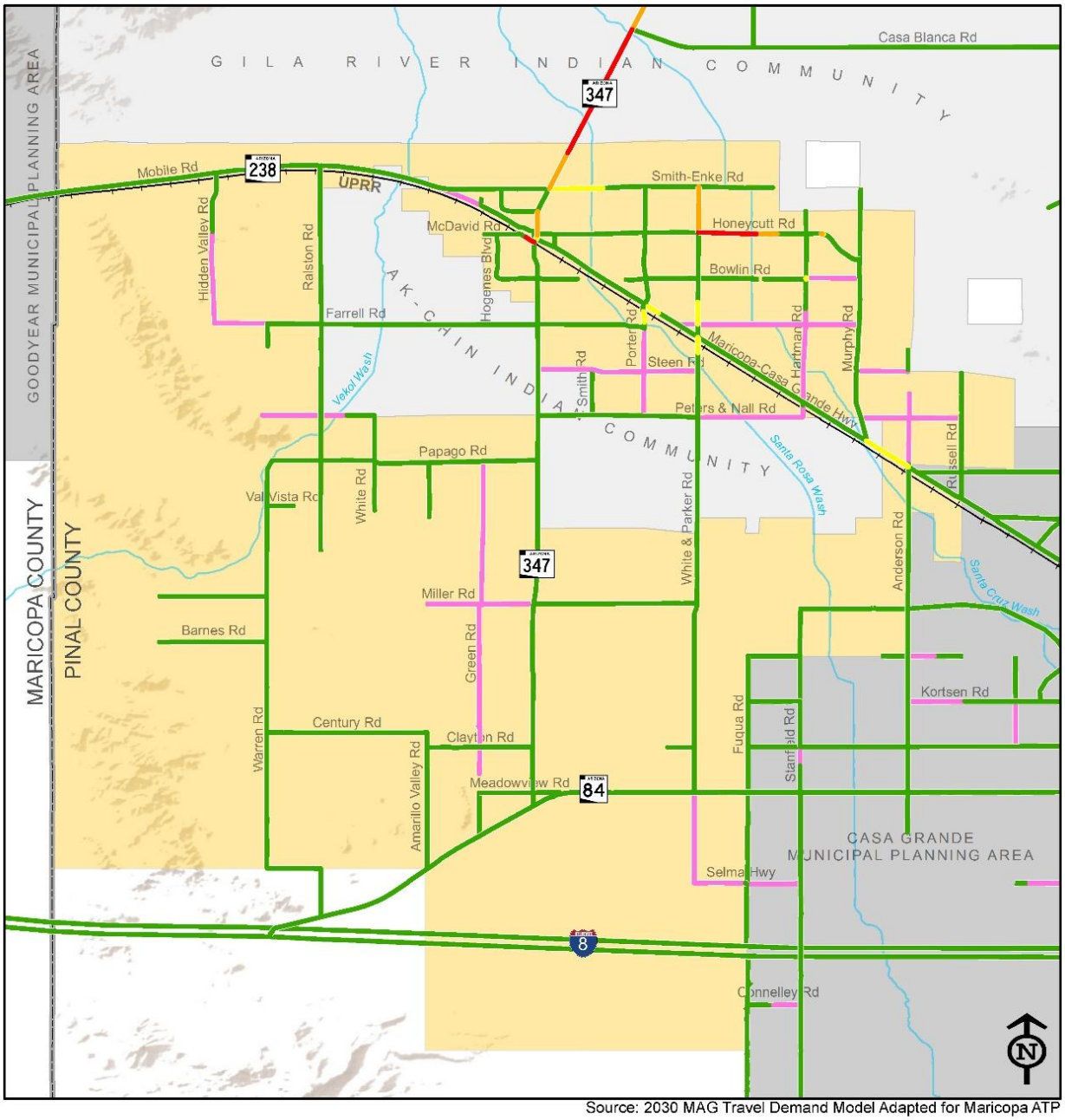
April 14, 2015

Figure 6-10 | Year 2030 Level of Service: Base Network (E+C) Conditions



Source: 2030 MAG Travel Demand Model Adapted for Maricopa ATP

Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area

Level of Service

- LOS A-C
- LOS D
- LOS E
- LOS F
- Paving Required

0 2 4
Miles

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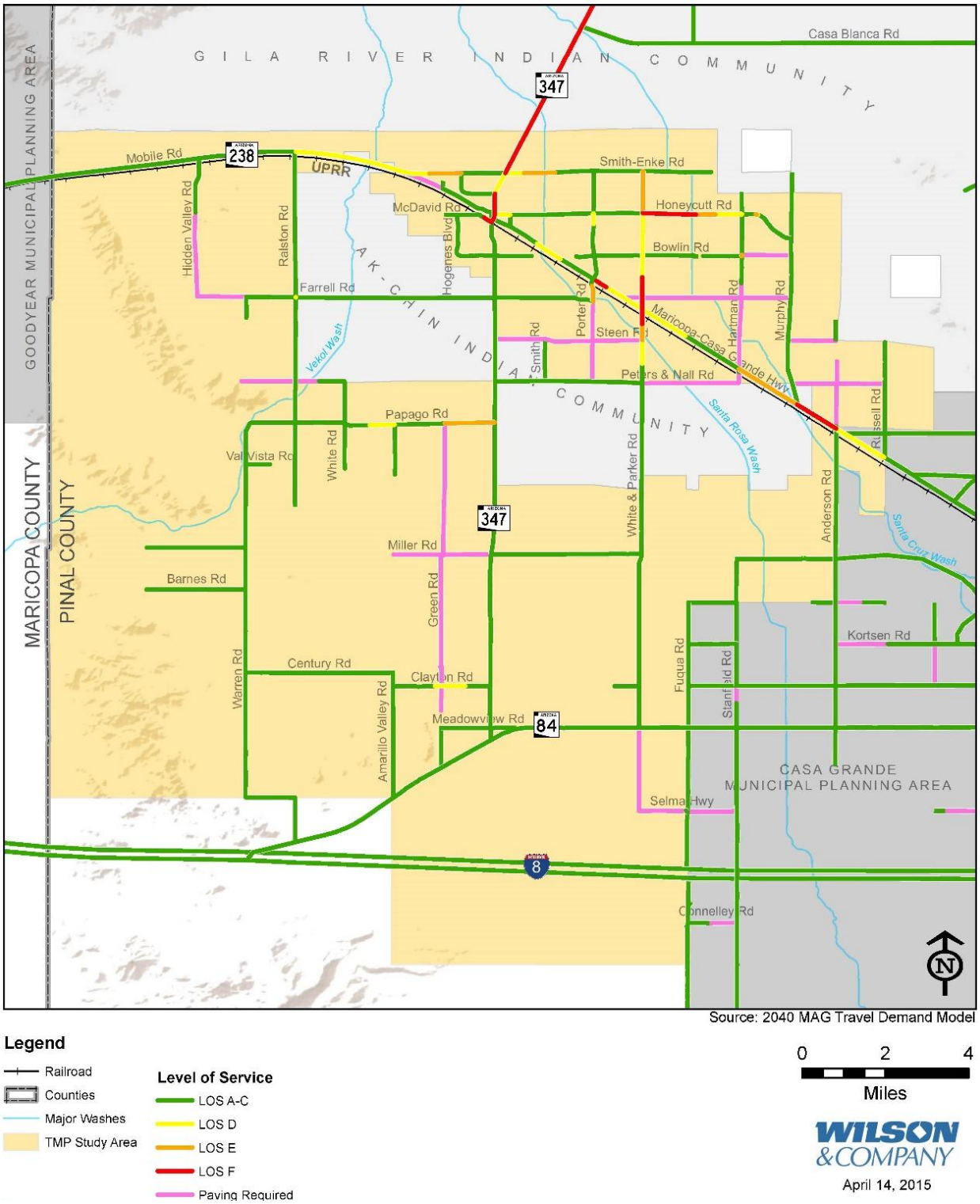
April 14, 2015

Figure 6-11 | Year 2040 Level of Service: Base Network (E+C) Conditions



Source: 2040 MAG Travel Demand Model

Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area

Level of Service

- LOS A-C
- LOS D
- LOS E
- LOS F
- Paving Required

0 2 4
Miles

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Table 6-3 | Potential Roadway Network Upgrades: E+C Roadway Network

Potential Network Upgrades	Mitigation Strategy
SR 347 north of Edison Rd.	Conduct additional study to determine the feasibility of upgrading to a 6-lane Parkway
SR 238, Ralston Rd. to SR 347	Widen to 4-lane Arterial
Honeycutt Rd.: White & Parker Rd. to Hartman Rd.	Widen to 4-lane Arterial
Maricopa-Casa Grande Highway (MCGH): Plainview St. Extension to White & Parker Rd.	Widen to 4-lane arterial
MCGH: White & Parker Rd. to Russell Rd.	Reconstruct as a 4-lane Parkway
Papago Rd.: White Rd. to SR 347	Widen to 2 lanes with a center left-turn lane
White & Parker Rd.: MCGH to Smith-Enke Rd.	Widen to 2 lanes with a center left-turn lane 1
White & Parker Rd.: Steen Rd. to MCGH	Widen to 4-lane Collector with improved at-grade railroad crossing
Porter Rd.: Santa Rosa Dr. to Farrell Rd.	Widen to 4-lane Collector with all-weather crossing of Santa Rosa Wash
Anderson Rd.: Steen Rd. to approximately ½ mile south of Steen Rd.	Pave roadway connection
Bowlin Rd.: White & Parker Rd. to Anthony Blvd.	Construct 4-lane Arterial with all-weather crossing of Santa Cruz Wash 2
All Identified Unpaved Roadway Upgrades	Pave roadways as 2-lane Collectors

Notes: **Prepared by Wilson & Company, February 2015.**
(1) This improvement is planned for implementation in Fiscal Year 2017-18.
(2) This improvement will require a bridge or dry weather crossing at the Santa Cruz River. This crossing would lie within the Eagle Shadow Development Area.

6.4 RECOMMENDED NETWORK UPGRADES

This section presents a set of recommended roadway network improvements to the E+C or Base Roadway Network for each of the three planning horizons: Year 2020, Year 2030, and Year 2040. The phasing of recommended improvements presented herein are in response to anticipated increases in travel demand on the study area roadways associated with future development. However, the need and/or timing for projects could be altered by other factors, such as drainage or flooding issues or the need for additional capacity to support traffic diversions associated with peak period congestion or roadway construction projects. One such example, an issue raised at the conclusion of this ATP effort, was the possibility of vehicles diverting to the Farrell Road and Porter Road corridors to avoid delays associated with the construction of the future SR 347 grade separation, which could result in the need for widening these facilities and/or improving drainage crossings. Such issues remain the subject of analysis in conjunction with future study efforts.

YEAR 2020 ROADWAY NETWORK IMPROVEMENT RECOMMENDATIONS

Table 6-4 identifies facilities forming the Base Roadway Network that will need improvement by the Year 2020, along with the recommended mitigation strategy for each improvement. Improvement projects are listed in order of priority, based on the LOS analysis documented in Appendix D. The locations within the Study Area of recommended improvement projects are shown in Figure 6-12, which displays multiple roadway paving projects. These facilities currently are dirt roadways anticipated to have a future volumes in excess of 500 vehicles per day. Paving is recommended to improve local access, mitigate dust and improve air quality – particularly important in a nonattainment area. Appendix E includes a complete prioritized list of all projects recommended for Year 2020 and forecasted facility LOS, based on the level of future traffic volumes anticipated on each roadway segment.

Table 6-4 | Project Implementation Recommendations – Year 2020

Recommended Network Improvements	Mitigation Strategy
SR 347: Cobblestone Farm Dr. (South) to Cobblestone Farm Dr. (North)/Lakeview Dr.	Widen to provide 3 lanes in northbound direction (6 lanes total)
Intersection of SR 347 and Smith-Enke Rd.	Upgrade the intersection at SR 347/ Smith-Enke Rd
SR 347: Edison Rd. to Lakeview Dr.	Conduct Corridor Study to determine the feasibility of upgrading to a 6-lane Urban Arizona Parkway
SR 347: Lakeview Dr. to I-10	Conduct Corridor Study to determine the feasibility of upgrading to a 6-lane Arizona Parkway with associated improvements at Riggs Rd, Old Maricopa Rd, and I-10 Traffic Interchange
Multiple roadway paving projects	Upgrade all unpaved roads (500 vehicles per day or more)
Prepared by Wilson & Company, February 2015.	

YEAR 2030 ROADWAY NETWORK IMPROVEMENT RECOMMENDATIONS

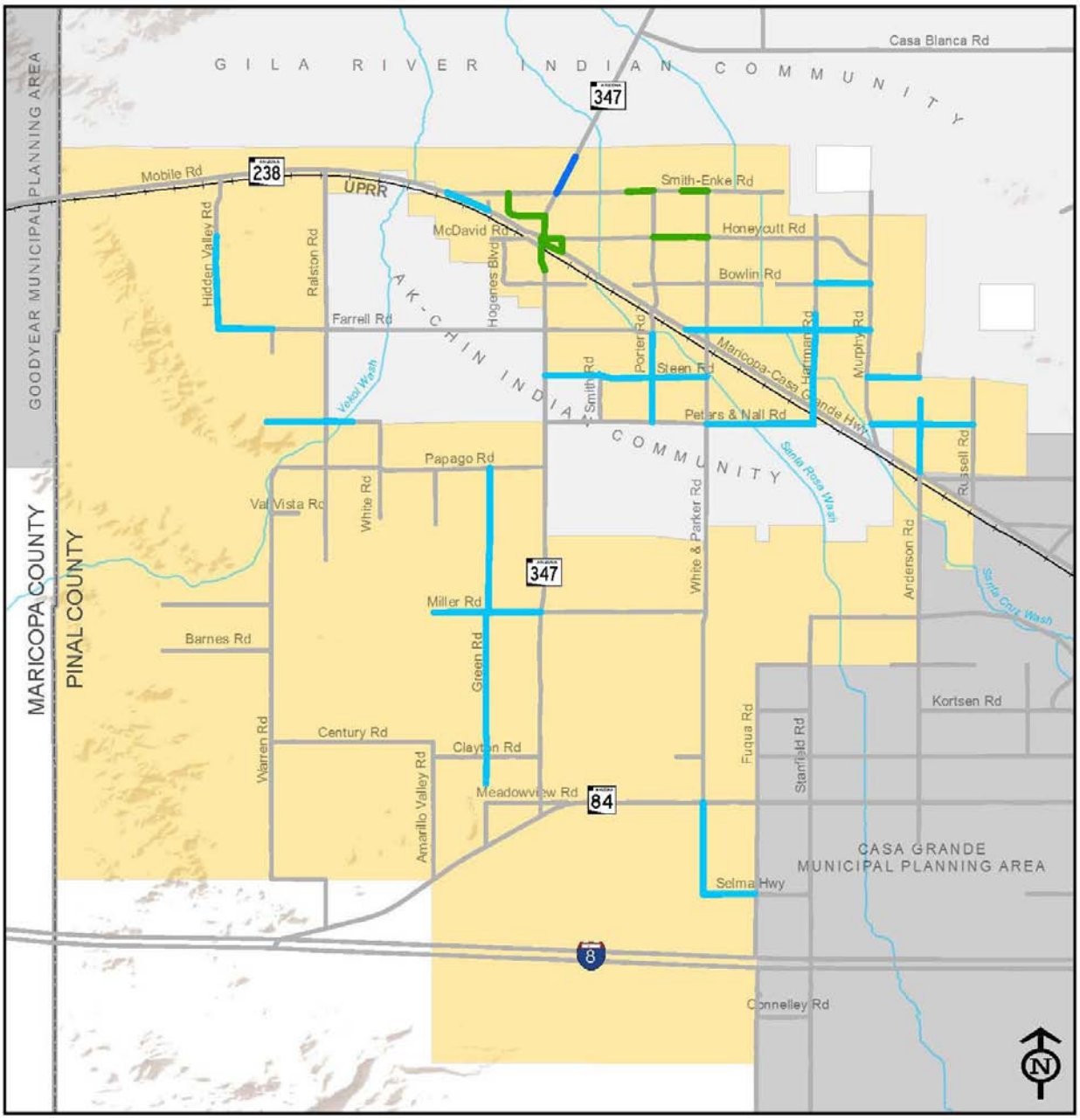
Table 6-5 identifies elements of the Base Roadway Network that will need improvement by the Year 2030, along with the recommended mitigation strategy for each improvement. Projects are listed in order of priority, based on the LOS analysis documented in Appendix D. The locations within the Study Area of the recommended improvement projects for Year 2030 improvements are shown in Figure 6-13. Appendix E includes a complete prioritized list of all projects recommended for Year 2030 and forecasted facility LOS, based on the level of future traffic volumes anticipated on each roadway segment.

Table 6-5 | Project Implementation Recommendations – Year 2030

Recommended Network Improvements	Mitigation Strategy
Honeycutt Rd: White & Parker Rd. to Hartman Rd.	Widen to 4-lane Arterial
SR 347: Lakeview Dr. to I-10	Implement capacity improvements/upgrades as determined by Corridor Study
SR 347: Edison Rd. to Lakeview Dr.	Implement capacity improvements/upgrades as determined by Corridor Study
White & Parker Rd.: Maricopa-Casa Grande Highway (MCGH) to Smith-Enke Rd.	Widen to 2 lanes with a center turn lane including intersection improvements*
White & Parker Rd.: Steen Rd. to MCGH	Widen to 4-lane Collector with improved at-grade railroad crossing
Bowlin Rd.: White & Parker Rd. to Anthony Blvd.	Construct 4-lane Arterial with all-weather crossing of Santa Cruz Wash
Anderson Rd.: Steen Rd. to ~ ½ mile south	Pave roadway connection
Prepared by Wilson & Company, February 2015.	

* This recommendation is based on traffic model outputs and does not preclude the City from making a policy-related decision to recommend a new street design that would be reflective of proposed development patterns including the San Travesa subdivision, City of Maricopa Complex, Central Arizona College, and commercial strip development along Honeycutt Road.

Figure 6-12 | Location of Project Implementation Recommendations: Year 2020



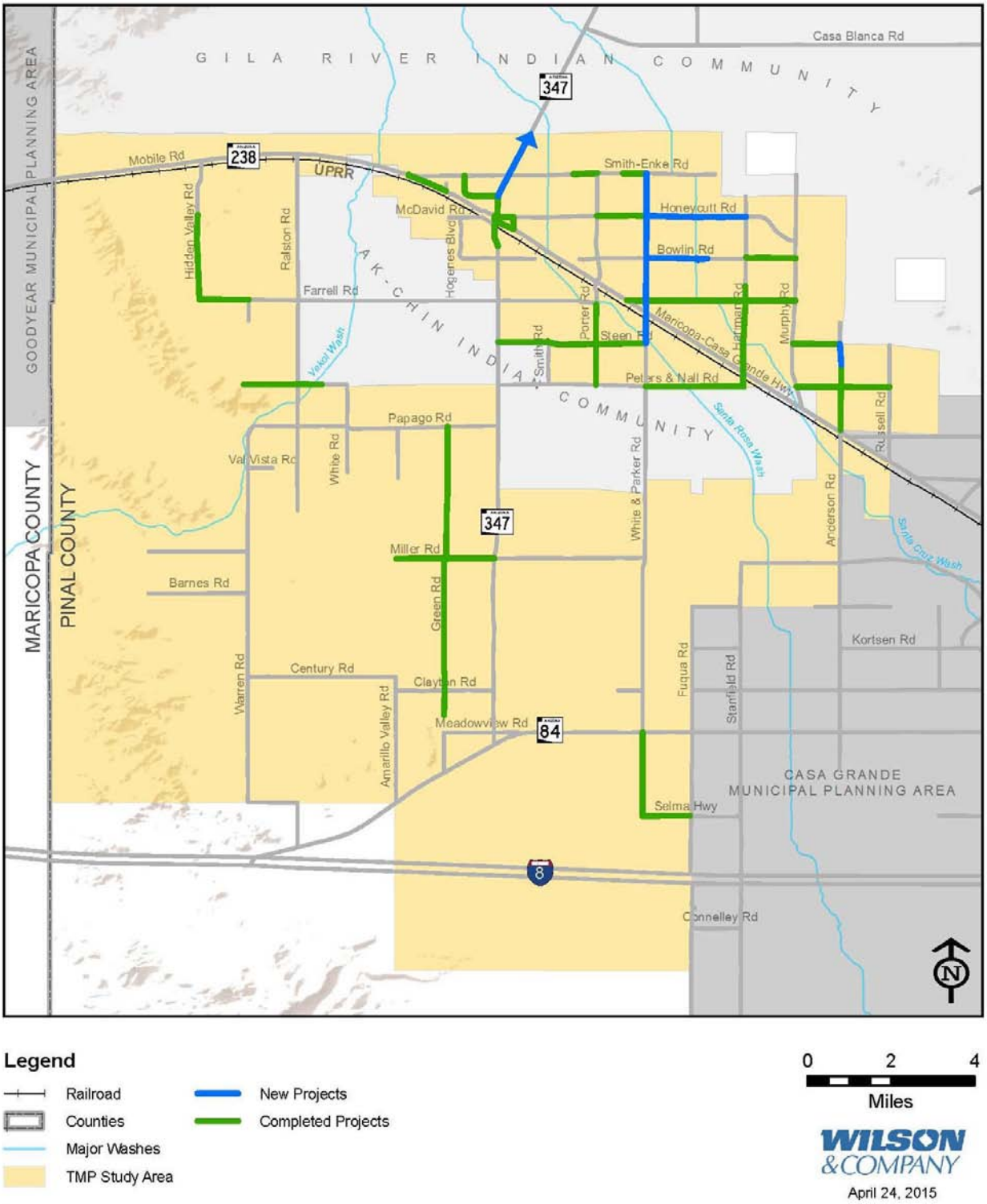
Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area
- New Projects
- New Projects (Paving)
- Completed Projects

0 2 4
Miles

April 24, 2015

Figure 6-13 | Location of Project Implementation Recommendations: Year 2030



YEAR 2040 ROADWAY NETWORK IMPROVEMENT RECOMMENDATIONS

Table 6-6 identifies elements of the Base Roadway Network that will need improvement by the Year 2040, along with the recommended mitigation strategy for each improvement. Projects are listed in order of priority, based on the LOS analysis documented in Appendix D. The locations within the Study Area of the recommended improvements are shown in Figure 6-14. Appendix E includes a complete prioritized list of all projects recommended for Year 2040 and forecasted facility LOS, based on the level of future traffic volumes anticipated on each roadway segment.

Table 6-6 | Project Implementation Recommendations – Year 2040

Recommended Network Improvements	Mitigation Strategy
MCGH: White & Parker Rd. to Russell Rd.	Reconstruct as a 4-lane AZ Parkway
Maricopa-Casa Grande Highway (MCGH): Plainview St. Extension to White & Parker Rd.	Widen to 4-lane Arterial
Porter Rd.: Santa Rosa Dr. to Farrell Rd.	Widen to 4-lane Collector with all-weather crossing of Santa Rosa Wash
SR 238: Ralston Rd. to SR 347	Widen to 4-lane Arterial
Papago Rd.: White Rd. to SR 347	Widen to 2 lanes with a center turn lane
Prepared by Wilson & Company, February 2015.	

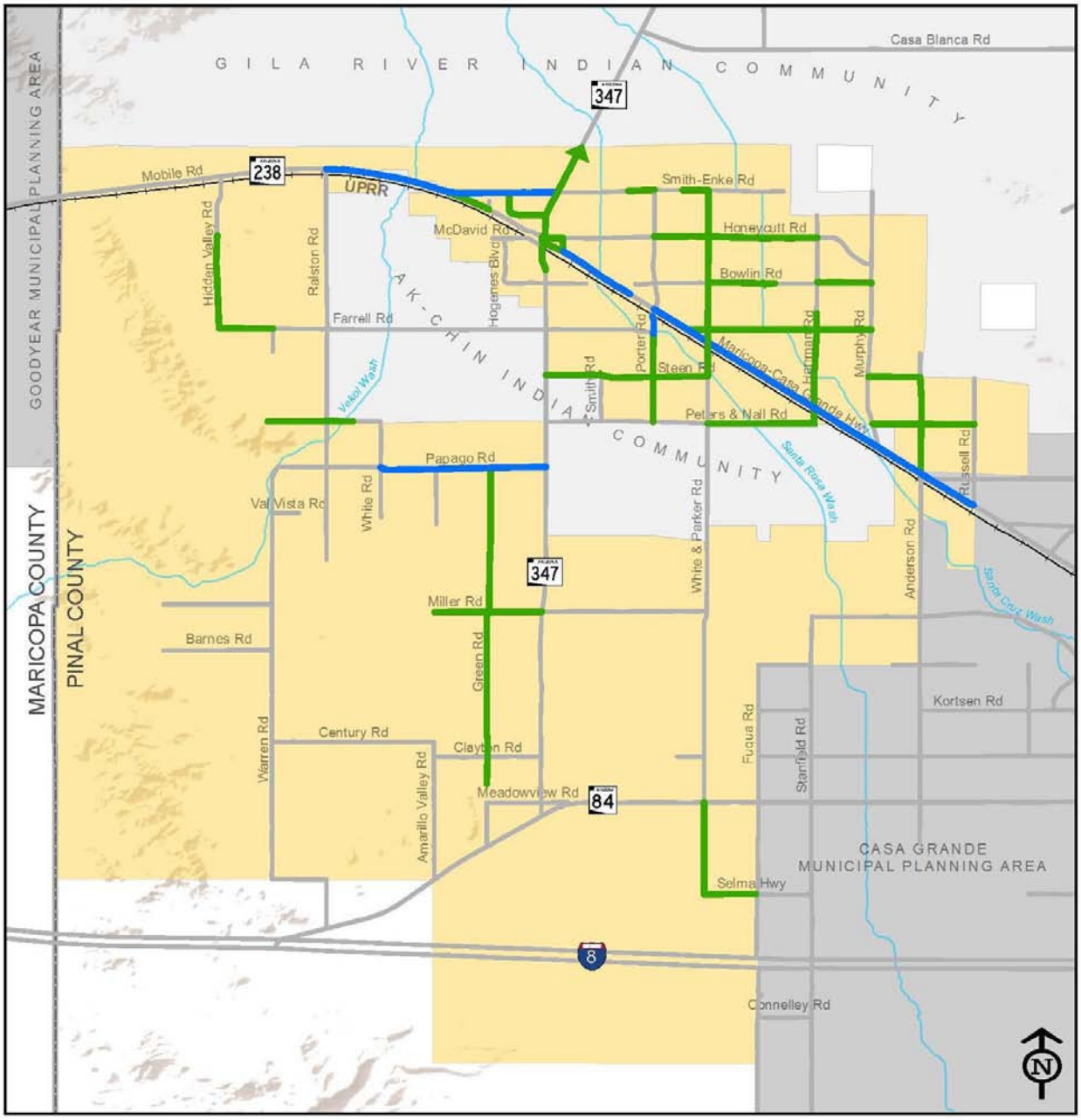
It should be noted that these recommendations do not reflect the need for extension of the East-West corridor east of MCGH in the Farrell Road corridor prior to Year 2040. However, this facility potentially could be constructed prior to 2040. Therefore, an additional analysis was conducted to determine the capacity that would be required, if the East-West corridor was constructed with the grade separation at White & Parker Road and connectivity to Farrell Road. Results indicate a four-lane interim parkway facility would be sufficient through Year 2040.

6.5 RECOMMENDED ROAD AND STREET CROSS-SECTIONS

In the 2008 RTP Update, street cross-section designs provided for bicycle and pedestrian facilities. The analysis of roadway network deficiencies and identification of a set of recommended improvement projects for Years 2002, 2030, and 2040 as well as the Buildout condition calls for some modification to these cross-sections. In addition, recent adoption of the “Complete Streets” concept by FHWA, state, regional (including MAG), and many local jurisdictions represents a new perspective toward the development and use of community roadway networks. Historically, the performance of community streets has been solely concerned with vehicular LOS; the Complete Streets concept focuses on the performance of multiple travel modes with respect to the streets and to each other. This paradigm shift in thinking about the community roadway network typically involves not just ease of accessing facilities. It also involves consideration of the real and perceived comfort and safety of nontraditional users of the roadway network, especially bicyclists and pedestrians either traveling solely within the mobility limits of the mode or accessing another mode, such as public transit.

Adjustments to the previously adopted cross-sections are needed to bring the cross-sections in line with Complete Streets principles and guidelines. Specifically, there is a need to provide additional buffering

Figure 6-14 | Location of Project Implementation Recommendations: Year 2040



Legend

- Railroad
- Counties
- Major Washes
- TMP Study Area
- New Projects
- Completed Projects

0 2 4
Miles

WILSON & COMPANY

April 24, 2015

between pedestrian areas and vehicular areas. Also, the width of medians and center turn lanes needs to be adjusted to better safety and comfort conditions at intersections and midblock crossings. A summary of recommended changes to the different types of major roadways serving the City of Maricopa are outlined below accompanied by diagrammatic representations of the revised cross-sections. More detailed specifications for each roadway type, including estimated costs to implement, are provided in Appendix F.

PARKWAY – Figure 6-15 illustrates the 2008 RTP Update section design for streets designated as Parkway. Recommended changes are highlighted in orange. The addition of a 5-foot landscape buffer between the curb and Multi-Use Path would provide a physical barrier, improving the safety and security of pedestrians. Increasing the median width from 60 feet to 74 feet is recommended per the standards design guidelines adopted for the Arizona Parkway by MAG, MAG member agencies, Maricopa County, and Pinal County.
PRINCIPAL ARTERIAL – Figure 6-16 and

Figure 6-17 illustrate the 2008 RTP Update cross-section designs for Principal Arterial with single and double ;eft-turns. Recommended changes are highlighted in orange. The pedestrian zone on one side of the street for both classes has been widened from a 6-foot sidewalk to a 10-foot Multi-Use Path to fully accommodate off-street bicycling and increase pedestrian capacity. The Multi-Use Path should be constructed on corridors identified with Multi-Use Paths. The median width of the Principal Arterial with Single Left- Turn (Figure 6-16) has been reduced from 20 feet to 16 feet to accommodate a left-turn lane, while maintaining a 4-foot median nose at intersections. The median width of the Principal Arterial with Double –Left Turn (Figure 6-17) has been increased from 20 feet to 28 feet to accommodate two left-turn lanes and the 4-foot median nose at intersections is maintained.

MINOR ARTERIAL –
Figure 6-18 illustrates the 2008 RTP Update cross-section design for streets designated as Minor Arterials. Recommended changes are highlighted in orange. A key change that would make this cross-section more compatible with the Complete Streets would be widening the pedestrian zone on one side of the street to 10 feet from 6 feet to create a Multi-Use Path that supports off-street bicycling and increases pedestrian capacity. Additionally, the median width has been increased from 14 feet to 16 feet, which allows for a 12-foot left-turn lane and a 4-foot median nose at intersections.
COLLECTOR – Figure 6-19 illustrates the 2008 RTP Update cross-section design for Collector streets. Recommended changes are highlighted in orange. The principal change to make this cross-section more compatible with Complete Streets would be widening the pedestrian zone on one side of the street to 10 feet from 6 feet to create a Multi-Use Path that supports off-street bicycling and increases pedestrian capacity, this requires a reduction in the landscape buffer area from 5 feet to 3.5 feet.
VILLAGE COLLECTOR – Figure 6-20 introduces a new street design – the Village Collector. It is most applicable for activity centers (e.g., Downtown areas and concentrated shopping districts), where access via bicycle, walking, and transit will be a higher priority than automobile access. The proposed cross section includes widening the sidewalk on one side of the street from 6' to 10' to increase pedestrian capacity. It also introduces on street parallel parking in a 10 foot wide curb lane, and an option to provide diagonal parking within a 20 foot wide curb lane (including a 2 foot buffer between the diagonal parked cars and the bicycle lane). This street design requires an additional 20 feet of right of way compared to the standard Collector; therefore, it would be most appropriate for new development or major redevelopment, where necessary rights of way would be more easily obtained.

Figure 6-15 | Parkway Cross-Section

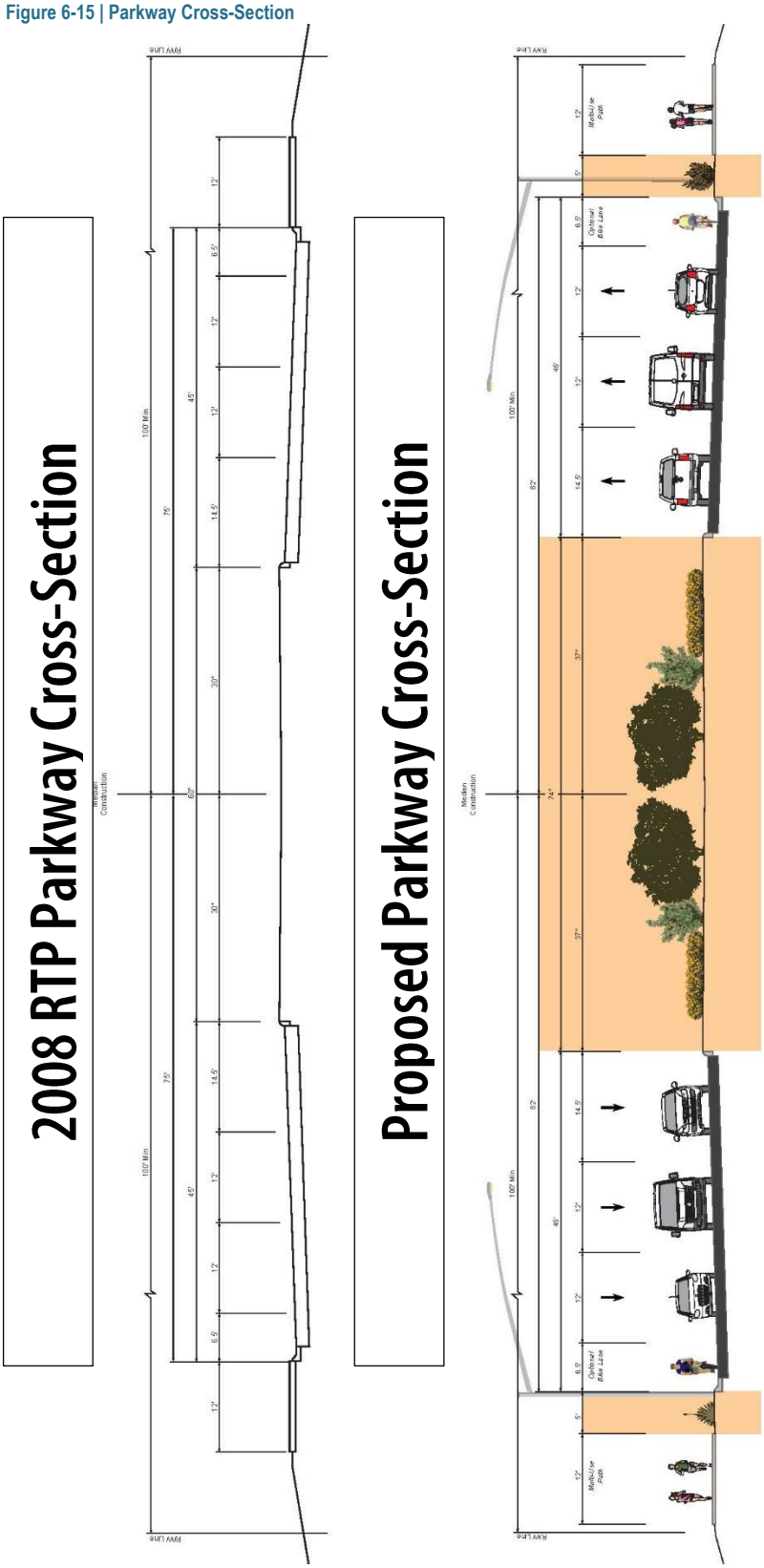


Figure 6-16 | Principal Arterial (Single Left-Turn) Cross-Section

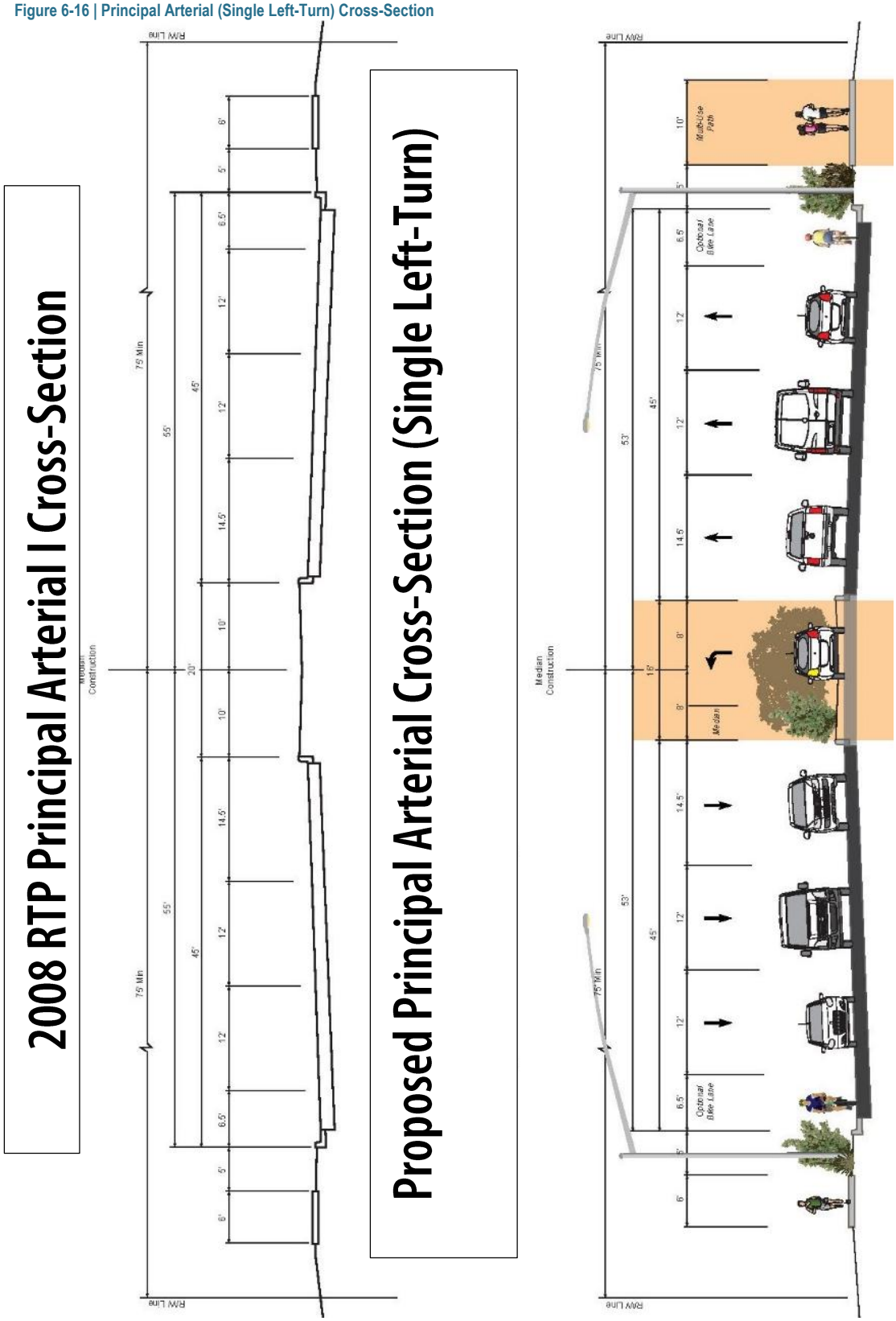


Figure 6-17 | Principal Arterial (Double Left-Turn) Cross-Section

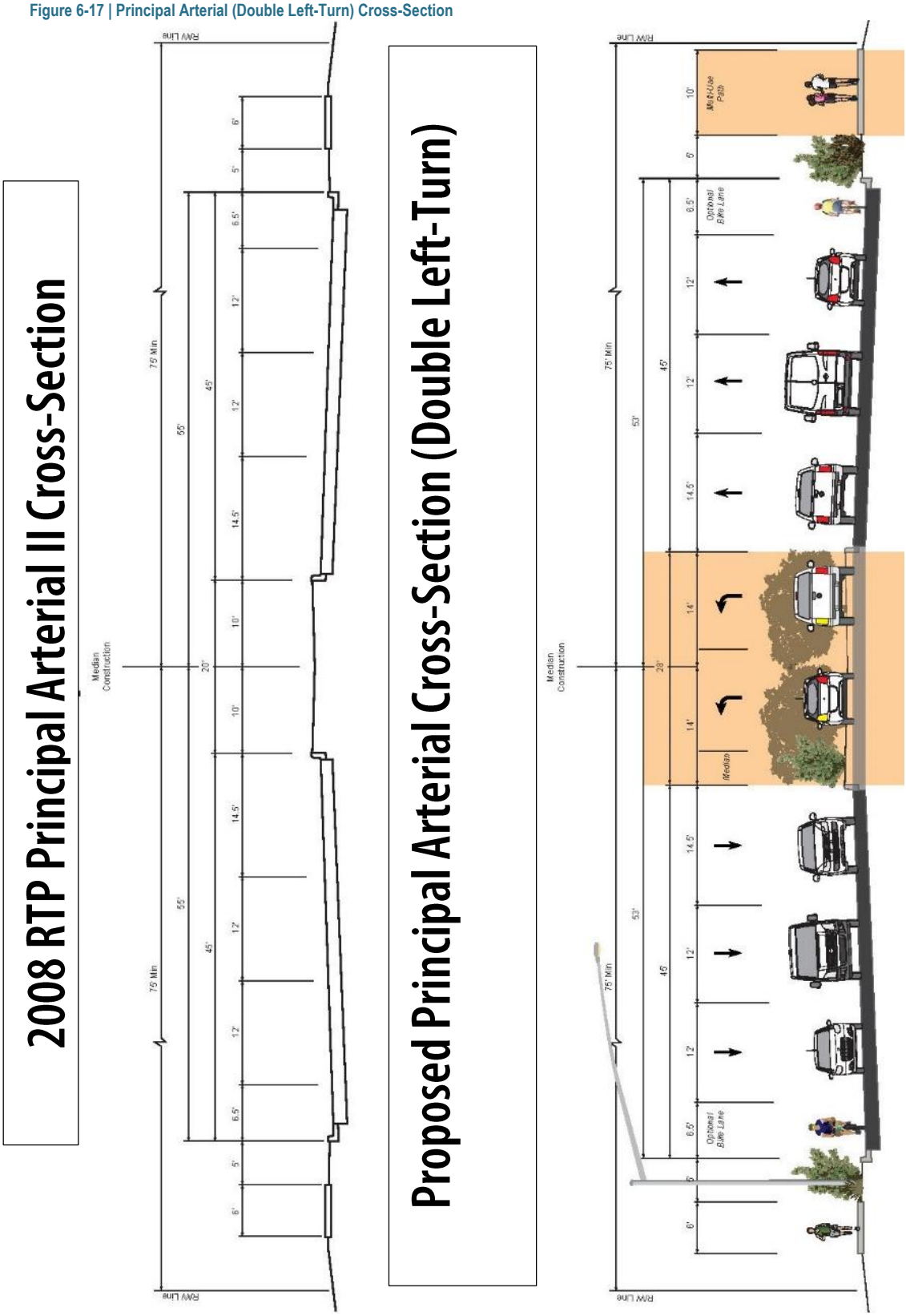


Figure 6-18 | Minor Arterial Cross-Section

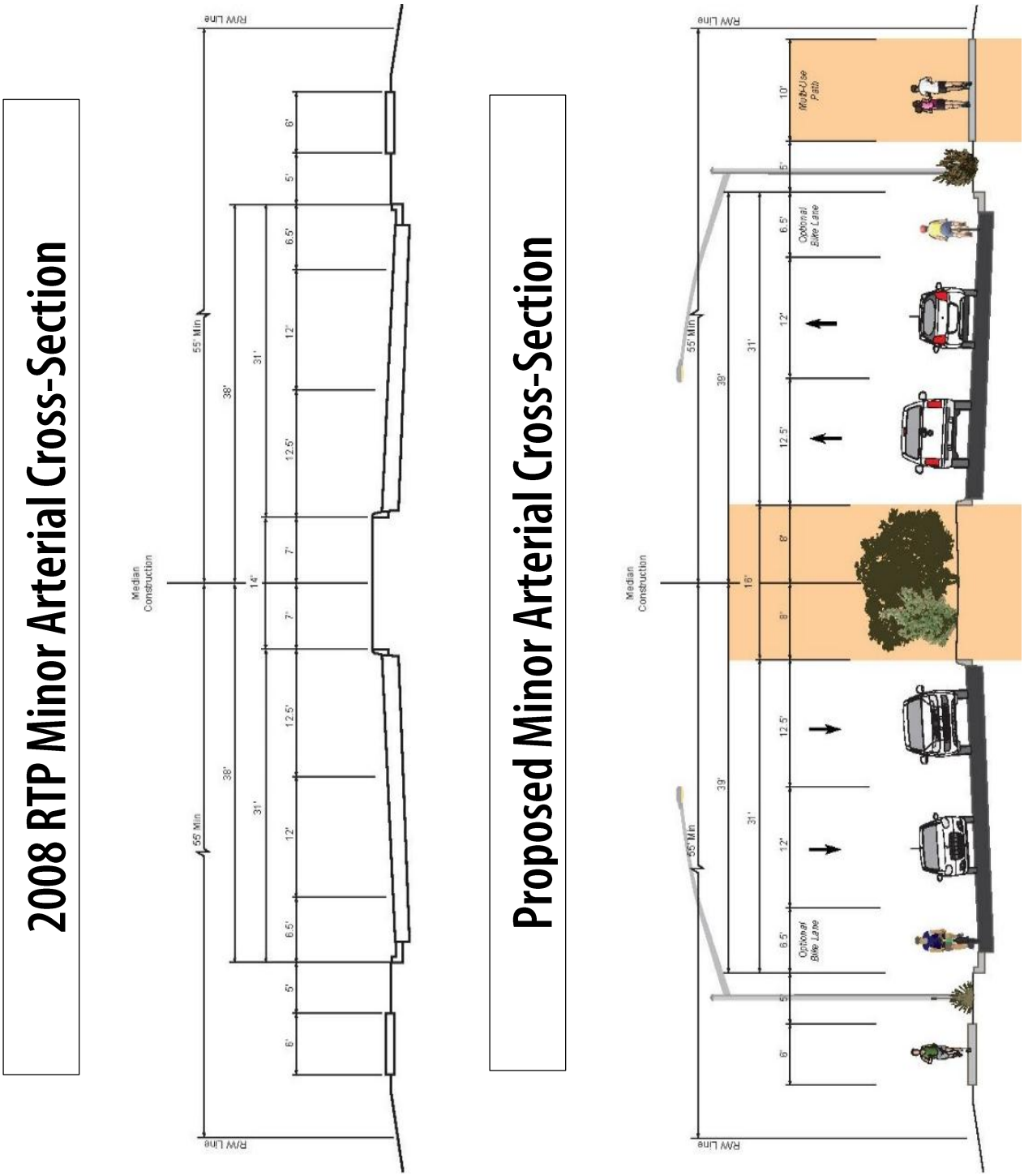


Figure 6-19 | Collector Cross-Section

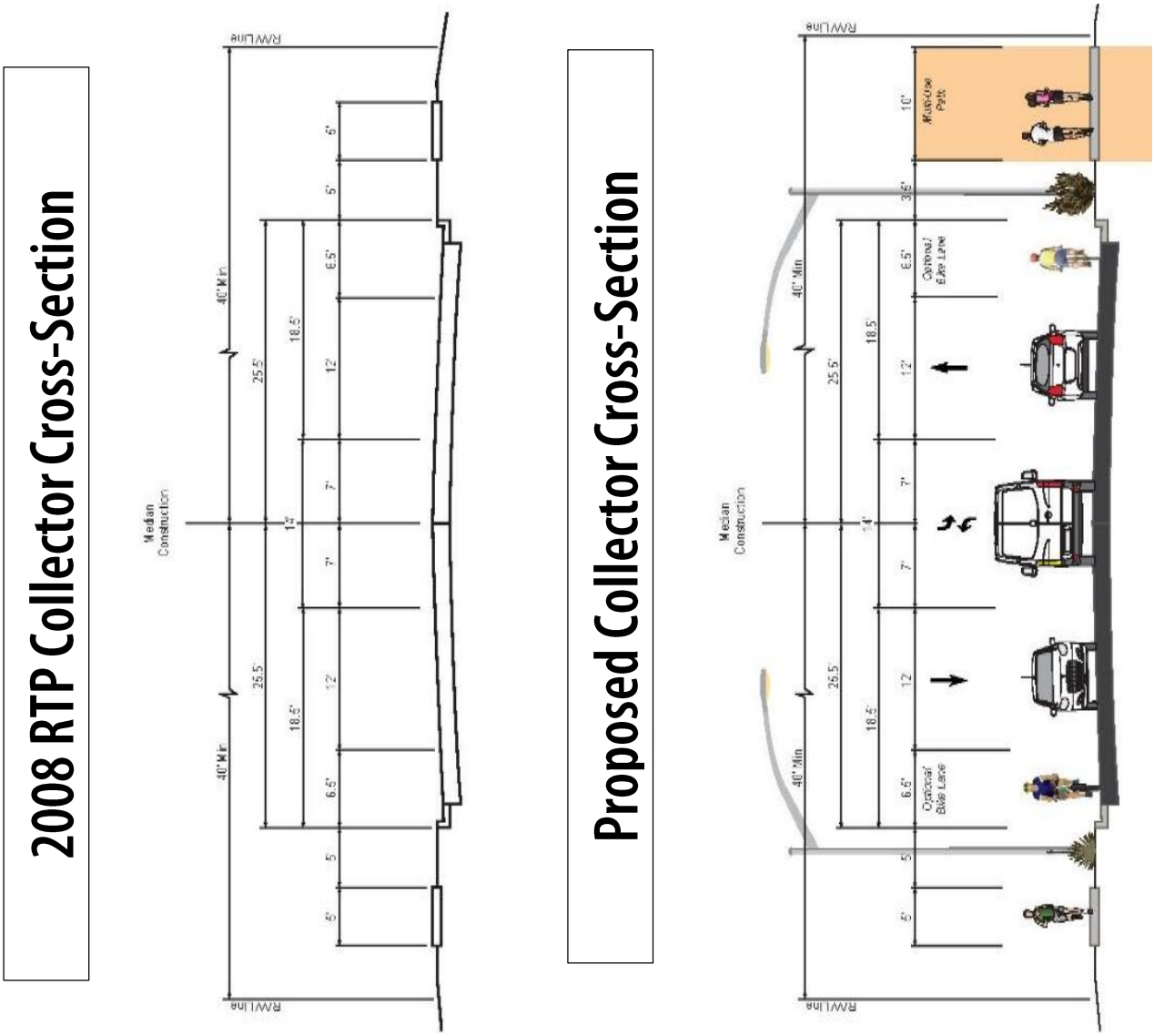
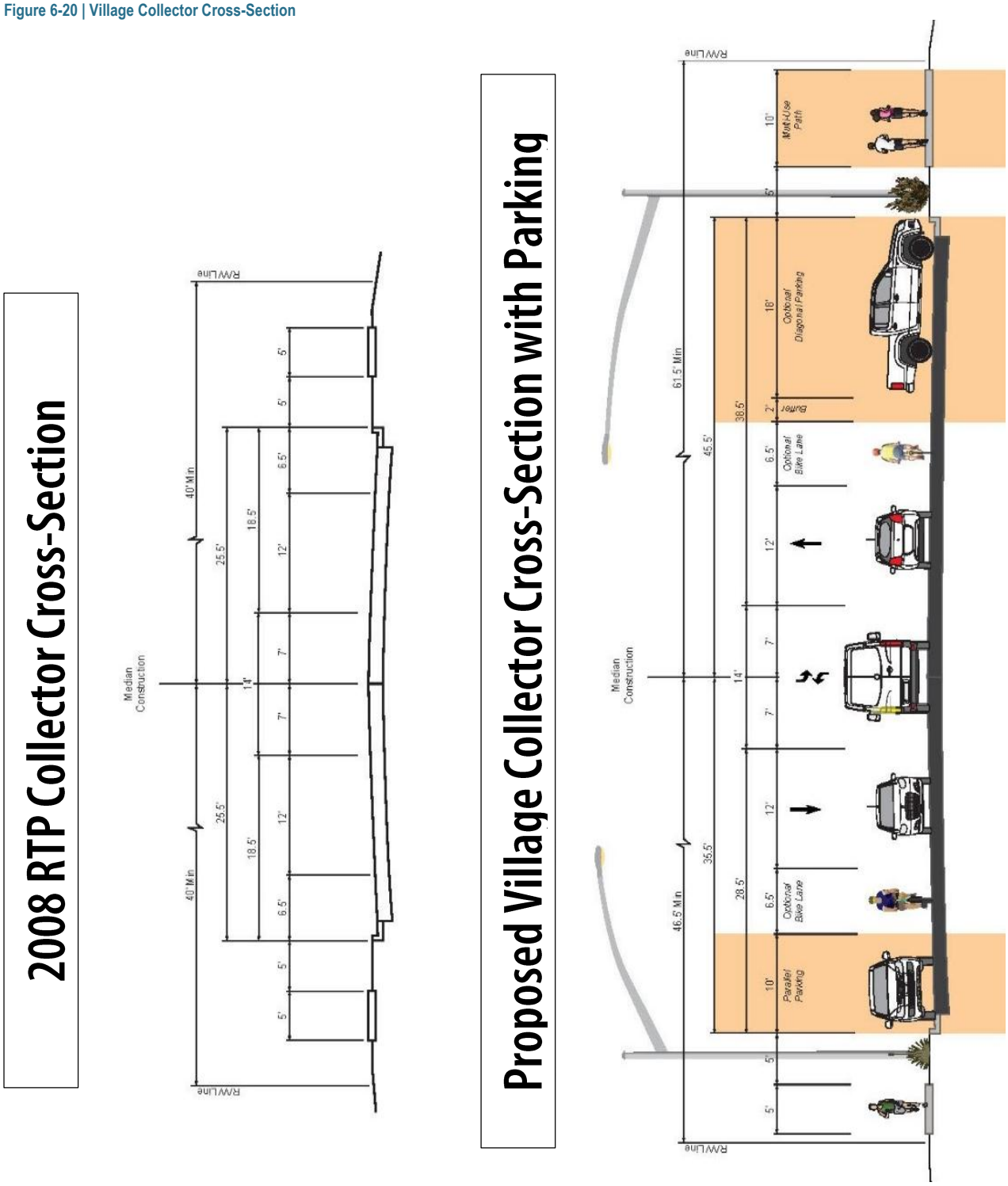


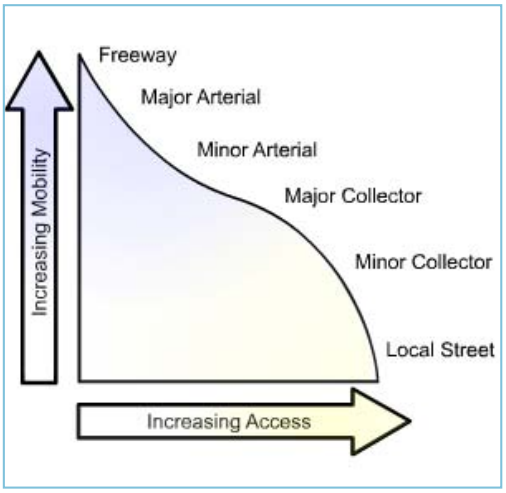
Figure 6-20 | Village Collector Cross-Section



60-Foot ROW Collector –Figure 6-21 introduces a new street design – the 60-Foot Right-of-way (ROW) Collector. It is mostly applicable in specific historic Character Areas where the right-of-way is constrained (e.g., the Heritage District), where access via bicycle, walking and transit will be a higher priority than automobile access. The proposed cross-section includes two 11-foot-wide travel lanes, two 4-foot-wide bike lanes (optional), two 9-foot-wide parallel parking lanes, and two 5-foot-wide sidewalks.

6.6 ACCESS MANAGEMENT

Access Management focuses on regulating and managing vehicular ingress and egress points to land parcels adjacent to all manner of roadways. It generally is accepted by highway and transportation planning officials that good Access Management promotes safe and efficient use of roadways and the overall roadway network. The illustration at right shows how Access Management is related to the roadway facility types identified and discussed in this TMP. Increasied mobility is associated with increased capacity typical of Arterial roadways and high-capacity freeways or expressways. By contrast, increased access is associated with Minor Collectors and Local Streets that have significantly less capacity for traffic movements. An important tenet of Access Management, therefore, is the adoption and enforcement of policies and standards that maintain the capability of those facilities with higher capacities to accommodate higher speeds and higher traffic volumes. If access is not controlled, traffic flows can be impeded, and the result likely will be congestion and less safe traffic movements. Comprehensive guidance was developed for the 2008 RTP Update in a Technical Memorandum titled Access Management Guidelines. This document provides adequate guidance for evaluating proposed roadway projects and proposals for access to existing roadways. Updated Access Management criteria for each roadway type are included in Appendix F, along with additional details regarding the design of facilities according to the Complete Streets concept and accepted Access Management Guidelines.



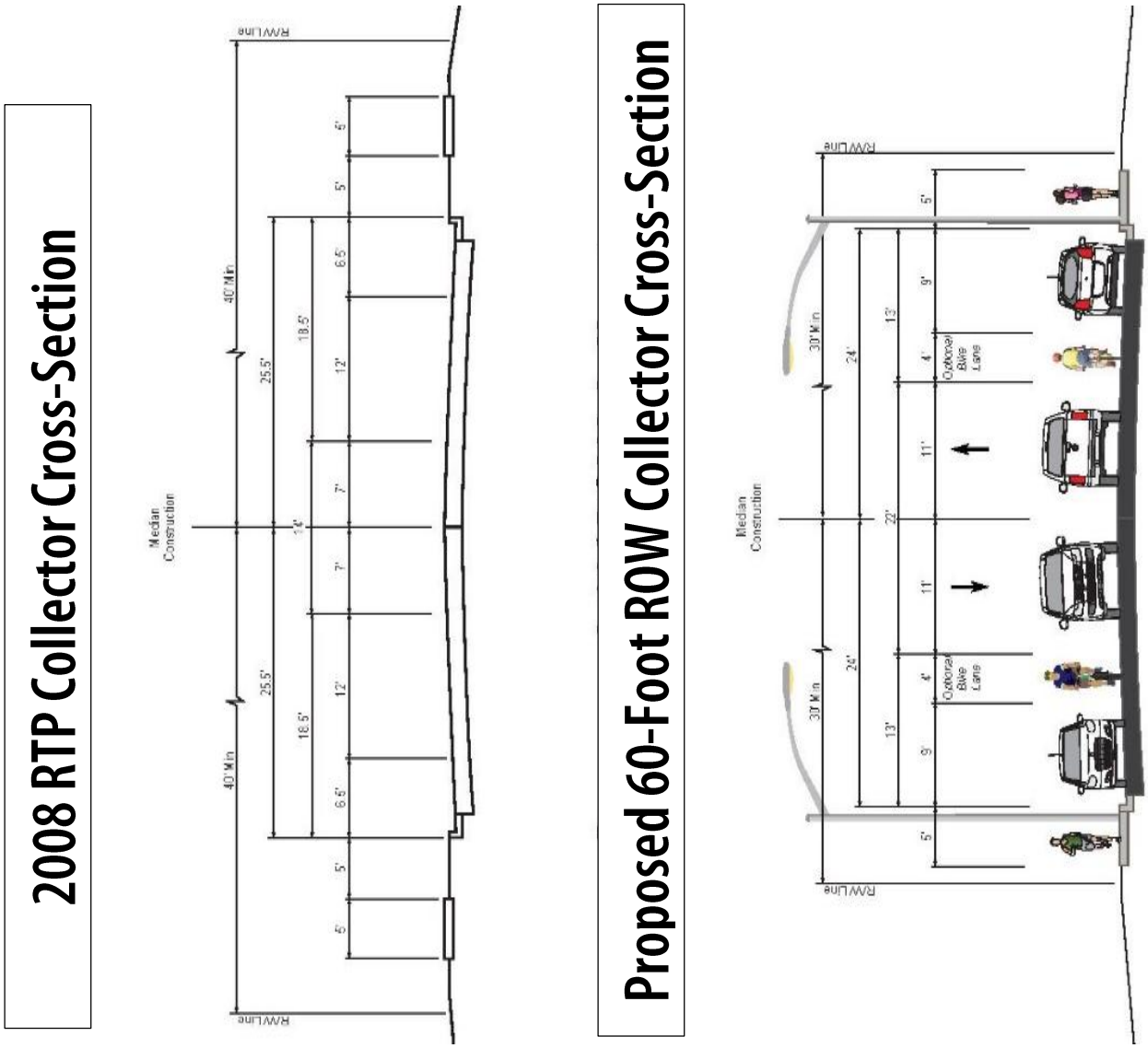
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Operations, Access Management Program Plan, at http://ops.fhwa.dot.gov/access_mgmt/progplan.htm.

6.7 SR 347 CONNECTIVITY AND FACILITY DESIGN

SR 347 is the primary connecting roadway between I-10 and in south central Maricopa County and I-8 (via SR 84) in western Pinal County and the southern portion of the Maricopa Study Area. This highway serves as the principal access route to the Phoenix metropolitan area from the Ak-Chin Indian Community (AKIC), the City of Maricopa, and the Gila River Indian Community (GRIC). SR 347 generally is known as Maricopa Road, but also is referred to as the American Indian Memorial Highway within the GRIC and John Wayne Parkway in the City of Maricopa. As a facility on the State Highway System (SHS), SR 347 is operated and maintain by the Arizona Department of Transportation (ADOT).

SR 347 is strategically important to the regional connectivity of the communities served with the Phoenix metropolitan area. In addition, the City's new affiliation with MAG for transportation planning purposes stresses the need to evaluate the SR 347 corridor for its full length from I-10 through the City to assess the

Figure 6-21 | 60-Foot Right-of-Way Collector Cross-Section



effectiveness, efficiency, and adequacy of this connectivity. The connection is vital to each community's social and economic welfare, a fact that stimulated the City, in particular, to join with MAG for regional transportation planning and programming activities. Many reports and studies have consistently expressed the need for improvements to SR 347. Therefore, an assessment has been prepared to provide a firm foundation for understanding the operational issues in the corridor and its physical characteristics, so that future planning toward realistic solutions may move forward.

The recently revised Maricopa County *Major Streets and Routes Plan* identifies SR 347 as a Future Corridor – Parkway. This is consistent with recommendations presented in the *Hidden Valley Transportation Framework Study, Pinal County Comprehensive Plan*, and Pinal County's RSRSM (identified as "High/Critical Priority"). Therefore, it follows that potential improvements to the SR 347 corridor should be investigated in more detail to provide a basis for moving forward with the formal planning process. Appendix G presents two Plan Sheets showing how in the near-term SR 347 would be widened and restriped within the existing right-of-way to provide additional capacity. The restriping and widening would provide six full lanes for through traffic between Smith-Enke Road and Cobblestone Farms Drive-North/Lakeview Drive. In addition, an additional left-turn lane would be added to the eastbound approach of SR 238 at SR 347 and an acceleration lane would be added to assist entry onto SR 347 for motorists turning right from the westbound approach of Lakeview Drive.

Other, long-term improvements to SR 347 should be considered to avoid significant congestion as growth continues through 2040. Appendix H presents an extended discussion of exiting physical and operating conditions of the SR 347 travel corridor. It also provides information regarding the ability of this vital roadway to accommodate the expected growth of travel demand between Maricopa and Phoenix metropolitan area. This document was prepared to establish a framework for understanding development, mobility, and access conditions in the corridor now and in the future. It also addresses issues potentially associated with future operations as additional growth and development occurs, and it provides conceptual treatments for key intersections to improve the efficiency of traffic operations and increase roadway capacity without major reconstruction actions.

7.0 COMPLETE STREETS ELEMENT

An important concept proposed for the City of Maricopa's future transportation system is development of "Complete Streets." Complete Streets is a modern planning approach to roadways that considers all modes of transportation equally and safely to make it easy to cross a street, walk to shops, bicycle to work, or access transit service. The goal of incorporating a Complete Streets approach to the City's ATP was a result of policy statements provided in the *City of Maricopa 2040 Vision Strategic Plan*.

City of Maricopa 2040 Vision Strategic Plan

Goal 4: Create safe and functional pedestrian ways and bicycle routes throughout the City of Maricopa.

Rationale: Movement within the City fosters individual health of citizens, builds community, relieves congestion, and increases local economic activities.

Strategies:

- Develop bike lanes on all possible arterial roadways and reasonable connections reaching all shopping and population centers within the City.
- Establish and maintain a citywide trails and pedestrian plan.
- Increase handicapped accessibility.

Transportation and Livable Communities

"Increasingly, transportation planning and project development are being more fully integrated with broader community goals, addressing a wider range of needs and leveraging the effectiveness of other programs."

Livability in Transportation Guidebook, FHWA.

The Complete Streets concept is intended to provide safe and effective access to transportation for all people regardless of age, physical ability, or transportation mode choice including individuals that drive, ride the bus, walk or bicycle (automobiles, transit users, bicyclists, and pedestrians). Complete Streets is a concept most relevant to the planning and design of arterial and collector roadways, where rights-of-way and cross-sections can safely accommodate all users. Nevertheless, the local street network should complement the arterial and collector network by providing connectivity for automobiles, bicyclists, and pedestrians. Supportive of this goal is the provision of amenities such as lighting which can both extend the hours of use of public infrastructure and can improve safety for drivers, bicyclists and pedestrians.

According to "Complete Streets, Complete Networks: A Manual for the Design of Active Transportation" by the Active Transportation Alliance, transportation systems that are planned and designed with Complete Streets often:

- Provide attractive, accessible transportation choices for people of all ages, physical abilities and income levels;
- Enhance the personal safety and security of people using the streets;
- Encourage people to travel by walking, bicycling, and transit and to reduce car use;
- Improve community health through expanded use of active transportation;

- Promote energy conservation, improve air quality and reduce other negative environmental impacts of the existing roadway network by reducing car use and expanding green infrastructure;
- Enhance the value of land uses that are adjacent to the street;
- Create livable neighborhoods;
- Increase civic space and encourage human interaction;
- Increase access to jobs, goods and services; and
- Promote the economic well-being of the community.

7.1 COMPLETE STREETS POLICY CONSIDERATIONS

A Complete Streets Policy establishes direction for community transportation planners and engineers relative to routinely review and evaluation of proposed street designs. A Complete Streets Policy promotes safe access and efficient mobility for all users of the City's publicly-supported and privately-paid transportation infrastructure elements, including a variety of ages, abilities, and travel modes. Such a policy often is focused on accommodating non-motorized travel modes on Arterial and Collector roadways; however, it also may identify tools like Subdivision Regulations to provide similar accommodations on Local and Minor Collector roadways. Specifically, Subdivision Regulations are a useful tool in the ongoing implementation of bicycle and pedestrian infrastructure, providing guidance for private development activity and particularly valuable to an ongoing implementation of a Complete Streets Policy. It is recommended City staff review existing Subdivision Regulations to determine if changes are needed to comply with the recommended Complete Streets profiles identified in Section 6.5 of this plan.

By passing a Complete Streets Policy, the City creates a vision for the community's street network that considers the needs for people who walk, bike, and drive. This vision guides the City's development and delivery procedures associated with transportation improvement projects. A successful implementation plan in support of the vision provides the framework for decision-making associated with the planning and review of proposed development projects, builds staff and councilmember buy-in, and facilitates measurement of the results of projects. For this reason, the City is encouraged to review, evaluate, and adopt a Complete Streets Policy. The process of drafting and adopting a Complete Streets policy will be further examined during Phase II of this ATP.

7.2 VISION

Creating and maintaining a system of Complete Streets within the City of Maricopa will aid in developing a safe and effective transportation system for residents and visitors alike. Making the community safe to walk and bicycle has the notable potential to foster improved health, encourage community interaction, promote sustainability and portray environmental stewardship. As the community grows, the construction of Complete Streets will diversify mobility options for transportation users, enhancing the potential for less reliance on automobiles and improving opportunities for greater transit use. To accomplish this, an interdisciplinary approach (requiring coordinated planning and engineering) will be used to make our transportation system safe and useful for all users. The public and private transportation infrastructure in the City of Maricopa will be designed, constructed and maintained to:

- Provide a safe and accessible transportation corridor for all modes;
- Be comfortable for all ages and abilities to use the corridor;
- Be cognizant of the surrounding land uses that influence the corridor use; and
- Consider all modes of travel as equals.

7.3 GUIDING PRINCIPLES

The following planning, design, and engineering principles support implementation and maintenance of Complete Streets within a community.

- Complete Streets are designed to serve all roadway users: pedestrians, bicyclists, transit riders, motorists, and heavy vehicles/freight regardless of age or mobile ability.
- Complete Streets will be designed and constructed with every new roadway or retrofit project, including roadway improvement and widening projects.
- Complete Streets will be designed and constructed within the context that they serve.
- Complete Streets Policy will apply to private roads as well, but will have to be evaluated case-by-case in order to apply the policy.
- Complete Street elements will be designed and constructed to enhance the safety of all roadway users.
- Complete Street improvements may be achieved incrementally as retrofitting improvements are achieved.
- Complete Streets may not be applicable on every street, in which case exceptions may be applied.

7.4 MODE PRIORITY

The priority of each mode may vary based on a combination of local conditions and planning goals, ultimately with the goal of promoting multimodal opportunities in the community. The mode priority is determined by any combination of component zones that make up a Complete Street. As illustrated in Figure 7-1, the three component zones include:

- **Travel Way:** the area within the curb-to-curb space of a street; if no curbs are present, then the Travel Way is the full pavement surface of the street. Within the Travel Way, the **Bike Realm** is a portion of curb-to-curb space dedicated to bicycle travel. This may be handled a number of different ways (e.g., bike lanes, sharrows, and green bike lanes), which enhance for motorists the visibility of the bicycle facilities and bicyclists.
- **Pedestrian Realm:** the area outside of the curb-to-curb space but within the right-of-way.
- **Context:** the areas directly adjacent to the right-of-way that make up the land use and development pattern.

Figure 7-1 | Component Zones of a Complete Street

The most important of these components is context. Each mode priority is best determined by the adjacent land use and development context, because the context dictates how residents and visitors must negotiate the path chosen for travel with the Travel Way to reach a given destination. Table 7-1 identifies the priority of the four primary travel modes – walk, bicycle, transit, and automobiles – relative to the land use and development context.

Table 7-1 | Mode Prioritization by Land Use Context

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

7.5 EXCEPTIONS

With few exceptions, the concept of Complete Streets should apply to all arterials and collectors. Implementation actions should strive to provide the following elements:

- Vehicular travel lanes;
- Sidewalks and pedestrian amenities (preferably buffered from vehicle traffic by a landscape strip or on-street parking, where allowed);
- Bicycle facilities (e.g., multi-use trails/paths, bike lanes, shared-lane markings, signage); and
- Transit (bus and paratransit) stops designed to accommodate pedestrian and bicycle access via convenient and safe routes.

It should be presumed that arterial or collector streets will be built or reconstructed to complete street standards and deviation from the complete street design should be the result of deliberate and formal action of the City Council, City Staff or the City Engineer. When the Complete Streets Policy is adopted the approver of the exceptions should be determined. In situations where all modes may not be safely accommodated, adjacent streets or trails should provide an alternative means to accommodate all users. Listed below are some exceptions that may be applied when challenged on the application of a Complete Street design:

- Prohibited by law (Interstate Highway System);
- Need to accommodate emergency maintenance activities (e.g., waterline repair, inlet repair, etc.);
- Need to accommodate general street maintenance and repair activities (e.g., sweeping, pothole repair, joint repair);
- City Council approves an exception, concluding that the Complete street principle is inappropriate;
- Implementation of guidelines would be cost prohibitive;
- Adverse impact on right-of-way;
- Excessive environmental impacts;

- Documented absence of current or future need for accommodation (consistent with *General Plan*); and
- The provision of Complete Streets elements would create an unsafe condition.

7.6 IMPLEMENTATION

Implementation of the Complete Streets concept for existing streets should take place as streets are improved; those changes that can be accommodated as roads are resurfaced. Restriping for bike lanes or turn lanes should be done at that time. Significant changes to the street cross-section or geometrics, like adding medians, widening streets, widening sidewalks, or other significant street reconstruction actions, should adhere to Complete Streets guidelines to the degree feasible as changes are being planned. Recommendations for implementing the Complete Streets concept and establishing a set of reasonable guidelines are presented below:

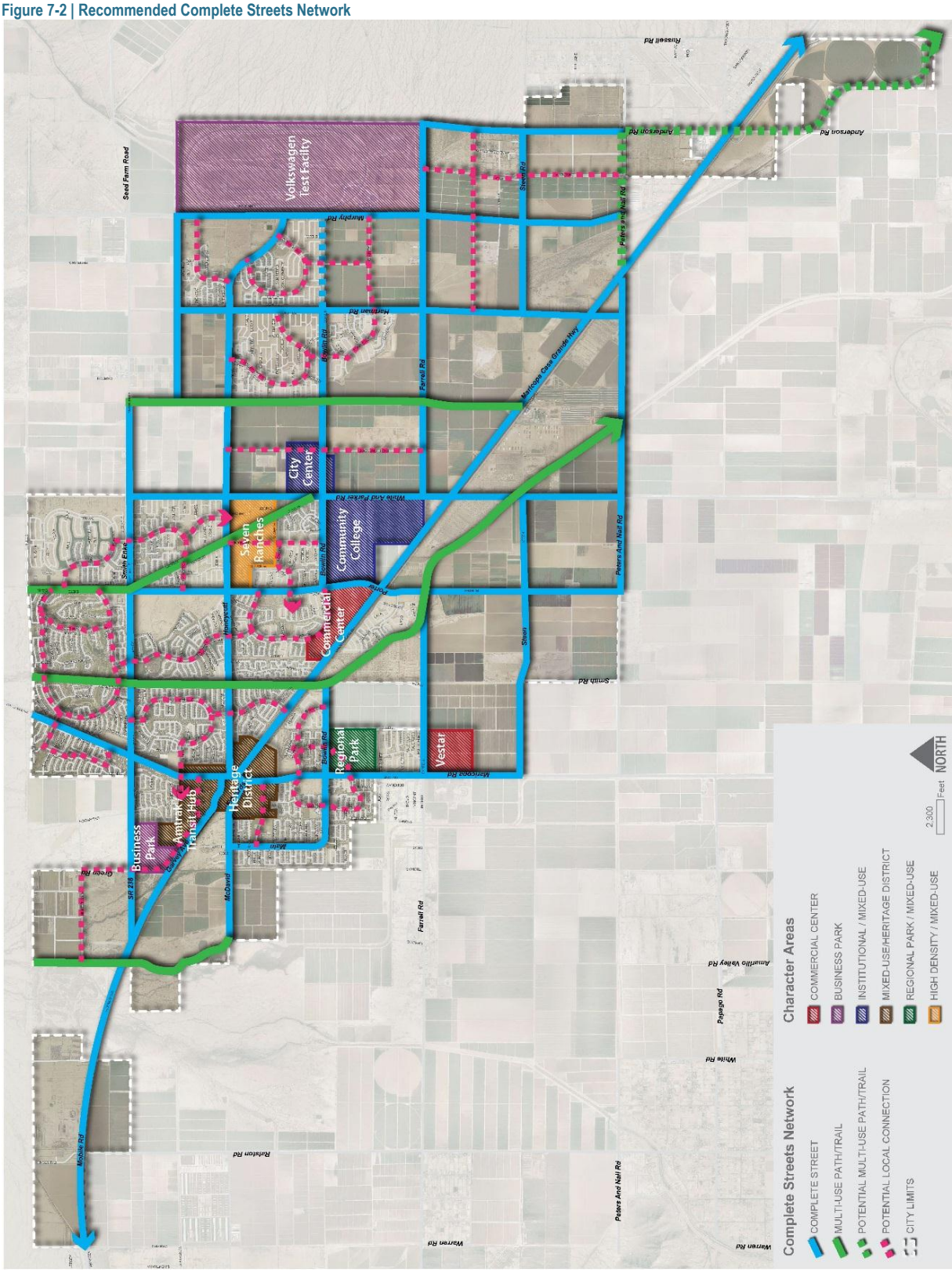
- Adopt a street design standard in which the future design of all streets ensures that the entire right-of-way is designed and operated to enable safe access for all users including transit, automobiles, trucks, bicycles, and pedestrians.
- City staff to review and determine if updates to subdivision regulations will be necessary.
- Provide direct bicycle and pedestrian connections within and between residential areas and supporting community facilities and services, such as shopping areas, employment centers, transit stops, neighborhood parks, and schools.
- Give special consideration to schools and the multimodal needs of students to provide safe, accessible routes for students. Give high priority to bicycle and pedestrian facilities within a two-mile radius of all schools in both new development and redevelopment areas. A City Council approved Complete Streets Policy can be the tool to communicate and enforce this action.
- Give special consideration to areas with concentrations of students, seniors, low-income families or others that are more dependent on transportation modes other than the automobile to ensure that they have a safe, accessible environment.
- Modify building and development standards and codes to require safe and accessible pedestrian and bicycle connections to transit stops.
- Pursue state, county, and MPO grants for completing street improvements through City-initiated projects.
- Within the City's Capital Improvement Plan (CIP) include a category for Complete Streets Implementation and identify projects that add to the incremental implementation of the Complete Streets Network.

COMPLETE STREETS NETWORK

Creation of a Complete Street network is an important step in providing connectivity for all modes across the City's transportation system.

Figure 7-2 maps the Arterial and Collector streets that are designated as future Complete Streets or streets with future Multi-Use Path accommodations. Many of these streets follow the one-mile section lines of the study area, or they are regionally significant routes, such as SR 347 (John Wayne Parkway/Maricopa Road) and MCGH. These type of streets typically carry a significant volume of traffic and provide needed connectivity throughout Maricopa. For this reason, the ultimate design of these Complete Streets still is likely to result in a higher priority placed on "automobile" travel.

Figure 7-2 | Recommended Complete Streets Network



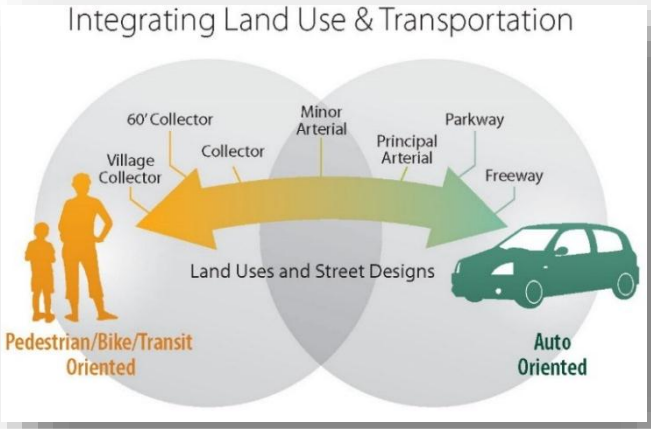
Regardless of the necessary recognition of the continuing role of the automobile in today's modern urban areas, such as Maricopa, the Complete Streets concept calls for alternate modes to be provided on all routes, wherever this can be accomplished safely and efficiently. Furthermore, as these routes cross through the City's different "Character Areas," mode priority of the street design likely will change to reflect the nature of the area and travel needs of the residents. For example, an area where dominant travel is school-related would justify greater emphasis on pedestrian and bicycle movement; whereas, a suburban commercial/business area will still need to accommodate access by automobiles. Nevertheless, the Complete Streets concept calls for the integration of all travel modes to the benefit of all persons, regardless of age or ability. Figure 7-2 relates the proposed Complete Streets and proposed Multi-Use Paths with planned Character Areas within the existing city limits.

Figure 7-3 is map showing the recommended Complete Streets Network for the MPA, including streets to be constructed or improved between years 2015 and 2040, streets to be constructed or improved after 2040, and off-street trails or paths identified in the previously adopted PTOS Plan.

COMPLETE STREETS APPROACH TO ROADWAY DESIGN

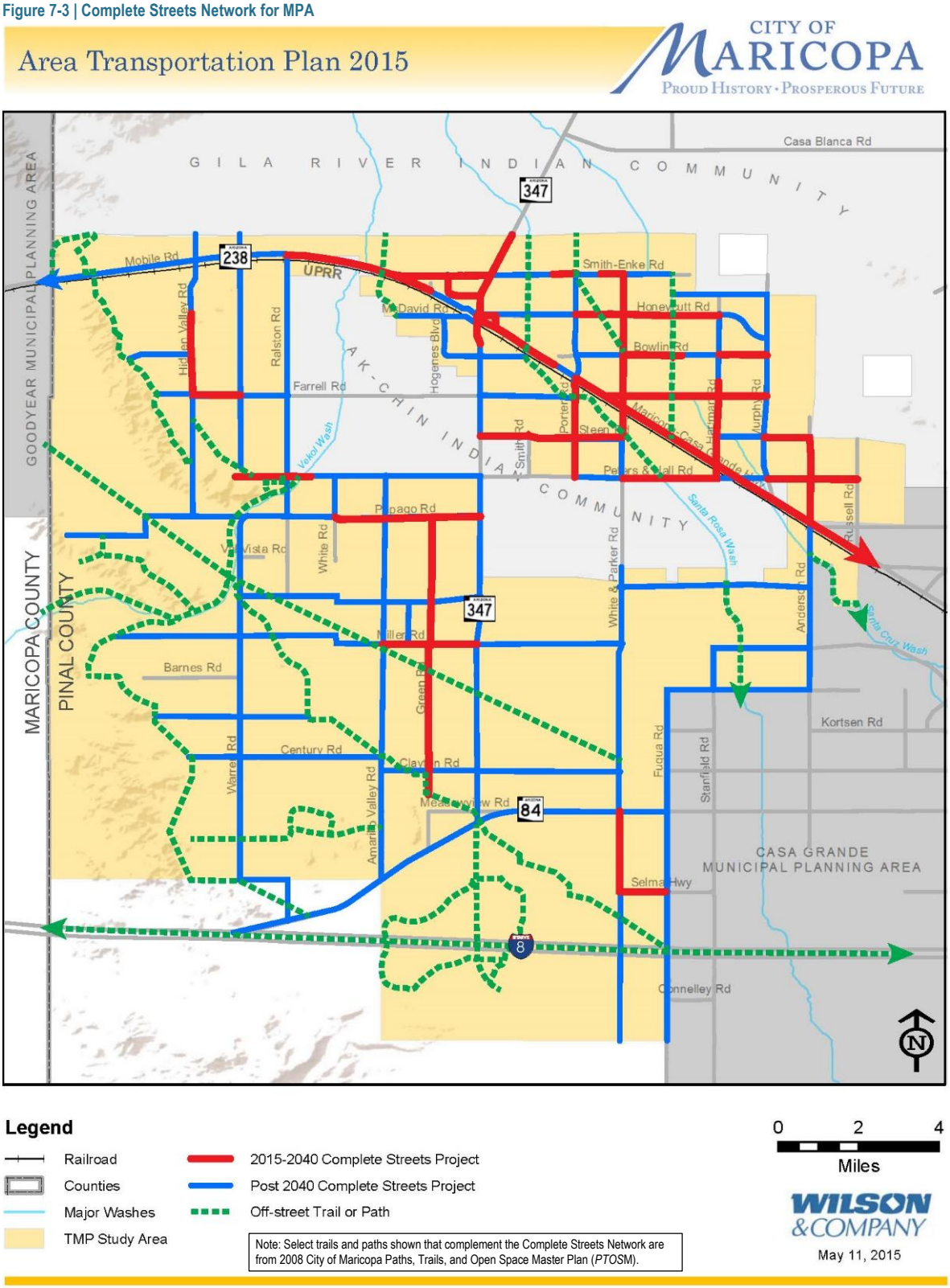
The Complete Streets concept is intended to provide safe and convenient transportation for all modes of travel (automobiles, trucks, bicycles, pedestrians, and transit users) to assure reasonable access and mobility for all users of the transportation system regardless of age or ability. Historically, the performance of streets has been solely concerned with vehicular level of service; the Complete Streets concept focuses on the performance of streets for all modes of travel. This paradigm shift in thinking typically involves not just ease of accessing facilities but the real and perceived comfort and safety of bicycle, pedestrian and transit facilities.

Each street type in a complete street network serves a different mode priority. Historically, the traditional way of thinking was that the higher functional classification of a street, the more that street should prioritize the efficient movement of vehicles to funnel the traffic away from an area as quickly as possible. Although this traditional way of thinking is the best way of providing clear and easy flow of traffic, some of these streets may cross through unique Character Areas of the community. Often times these Character Areas place a higher priority on the safety and comfort of people who walk, bike or use transit. For this reason, a Complete Streets approach to roadway design attempts to provide some correlation between the land use and development pattern proposed along a corridor to the cross-section design for that segment of the roadway; this is often referred to as context sensitive solutions.



Within Maricopa, the development pattern ranges from rural/undeveloped properties and farmland, to suburban residential developments, and some urban development patterns. Understanding land use context helps in the determination of mode priority. Street types serve a variety of functions that can result in a single corridor ranging from automobile oriented to pedestrian oriented (see illustration at right). The discussion of Character Areas in this

Figure 7-3 | Complete Streets Network for MPA



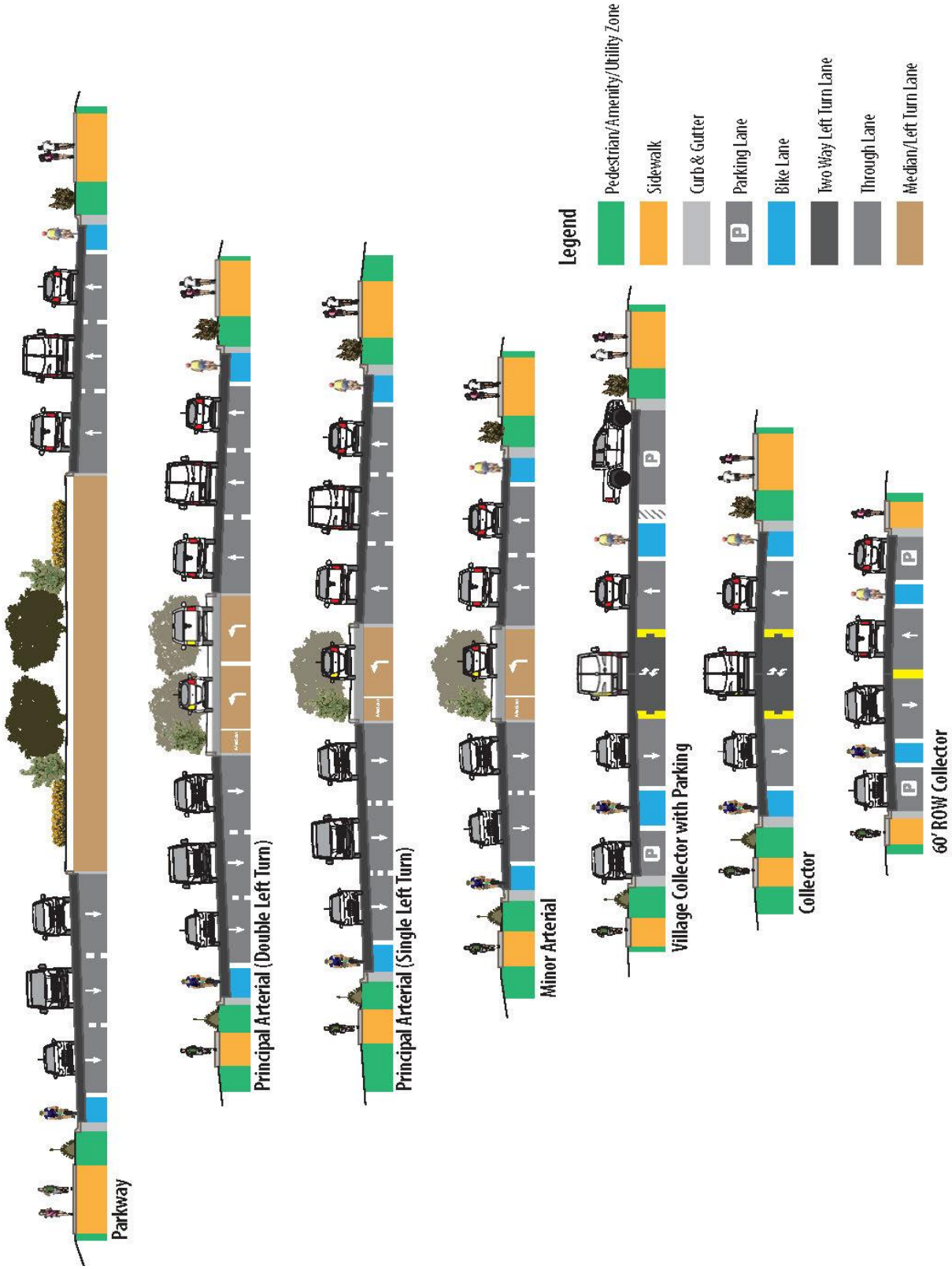
TMP is used to identify context sensitive solutions for different functionally classified roads. For example, Freeways and Parkways may be more automobile oriented while a Village Collector may be more pedestrian, bike or transit oriented.

In the 2008 RTP Update, street cross-section designs provided for bicycle and pedestrian facilities. Adjustments to these cross-sections are needed to bring the cross-section in line with Complete Streets principles and guidelines. A Complete Streets approach to each facility type is summarized in Table 7-2 and illustrated in Figure 7-4 (refer to Section 6.5 for more detailed regarding these cross-sections). Each facility type has a unique context and intent, as indicated by the abbreviated descriptions for each facility type in Table 7-2, which includes a statement of the typical context and intent of the roadway category.

Table 7-2 | Complete Streets Approach to Roadway Design

Facility Type	Context and Intent
Parkway	Also known as the Arizona Parkway, this road design is largely determined by the recommended standards per design guidelines adopted for the Arizona Parkway by MAG, MAG member agencies, Maricopa County, and Pinal County. The Parkway design is intended to provide a non-freeway restricted access facility that offers greater travel capacity than an arterial roadway including greater increased intersection capacity. A variety of land use types may be applied along this facility; however, the access control restrictions would likely deter developments requiring private drives. In addition to on-street bike lanes, two separated 10' multi-use paths are included in this complete street approach to the Arizona Parkway so as to provide a safer travel corridor for bicyclists and pedestrians.
Principal Arterial	This facility type is focused on the efficient movement of vehicular traffic over medium to long distances. The typical context includes commercial areas with many small commercial strips or pad sites with building setbacks that may include front parking lots. A Complete Streets approach to this facility design includes on-street bicycle lanes, a buffer separating the sidewalk and roadway, a 10' multi-use path for pedestrians and bicyclists, and a center median that can double as a pedestrian refuge for certain crosswalk locations.
Minor Arterial	This facility type is very similar to the Principal Arterial but includes less vehicular travel lanes which also eases the movement of bicyclists and pedestrians crossing the street.
Collector	The standard Collector is used to connect neighborhoods and services. They typically serve the function of connecting residential traffic to and from destinations and services. These corridors typically handle only moderate levels of vehicular traffic which is compatible with bicycling and walking activities. A Complete Streets approach to a Collector facility would include on-street bicycle lanes, and a buffer separating a sidewalk and a 10' multi-use path from the roadway.
Village Collector	Proposed as a new street design that would be more compatible with the unique land use mixes proposed in the city's Character Areas, the Village Collector is the most pedestrian, bicycle and transit oriented street design. These streets are intended for unique activity centers with a variety of land uses, including retail-oriented and high intensity mixed-use. The Complete Street design is intended to reduce emphasis on automobile traffic so as to encourage slow traffic and increase pedestrian and bicycle activity. The design includes use of on-street bike lanes, buffered pedestrian zones with wide walkways, and parallel on-street parking (diagonal parking is optional).
60' ROW Collector	Proposed as another new street design, the 60' ROW Collector is reserved for specific historic Character Areas within the community. This street design was created to accomplish the Complete Streets goal within the constrained right-of-ways often found in the Heritage District and older parts of the city. The Complete Streets approach to this roadway design is also focused on reduced travel speeds for automobiles, encouraging slow movement of traffic. The design includes on-street bicycle lanes, pedestrian zones, and on-street parallel parking.

Figure 7-4 | Complete Streets Approach to Roadway Design



8.0 TRAILS & PATHWAYS ELEMENT (PEDESTRIAN & BICYCLE)

The Trails and Pathways Element focuses on modes of transportation other than the motorized vehicles – namely, bicycles and pedestrians. The importance of these alternative modes of travel for the City is documented in: City of Maricopa *General Plan* 2006, 2008 City of Maricopa PTOS Master Plan, and *City of Maricopa 2040 Vision Strategic Plan*. This Element provides guidance for the long-term development of a rational network of facilities for use by bicyclists and pedestrians relative to the vision, goals, objectives, and recommendations found in these community documents. It presents a general framework for improving facilities and travel conditions for bicyclists and pedestrians to support and promote safe, comfortable, and convenient movements within the community. It then identifies more specific "tools" to addressing the direct needs of bicyclists and pedestrians relative to facility design, use policy, and continuing planning and development.

8.1 TRENDS IN TRAVEL BEHAVIOR

It is important to understand patterns of travel associated with bicyclists and pedestrians to adequately address facility planning and attain increased mobility. Children, older adults, and people with disabilities often require an alternative form of transportation for moving around within a community, but the facilities supporting this movement generally are inadequate. Generally speaking, increasing accessibility and mobility of these groups of a community's citizens increases the accessibility and mobility for all travelers.

The FHWA asserts that bicycling and walking are becoming more popular, whether associated activities be for sport, recreation, exercise, or simple enjoyment. The National Survey of Bicyclist and Pedestrian Attitudes and Behavior found with regard to bicycling that:

> *…slightly less than half (46%) of those 16 and older have regular access to a bicycle, with access increasing with increases in household income.*
>
> *About 43 percent ride a bicycle at least once in the summer months, making an estimated 2.484 billion trips during the summer of 2002.*
>
> *Bicycling declines with age, with those under 20 most likely to bicycle and doing so more frequently, while the majority over 45 did not bicycle during the summer months.*[16]

Regarding walking and other pedestrian-type activity, the survey found that:

> *About 86 percent of people 16 or older walked, jogged or ran outdoors for 5 minutes or more during the summer months, with 78 percent doing so within the [previous] 30 days.*
>
> *Personal errands (38%), exercise (28%) and recreation (21%) are the most common reasons for trips.*
>
> *About 6 percent of pedestrians felt their personal safety threatened on their most recent trip, with 62 percent saying they felt threatened by motorists.*[17]

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[16] Volume I: Summary Report, National Survey of Bicyclist and Pedestrian Attitudes and Behavior, National Highway Traffic Safety Administration (NHTSA), August, 2008 (DOT HS 810 971).

[17] Ibid.

Other US Department of Transportation (USDOT) findings regarding bicyclist and pedestrian travel as a transportation mode indicates younger people, in particular (specifically, Millennials) are not as engaged in driving as previous generations. This trend is characterized by fewer miles driven, longer time before applying for driver's licenses, and more frequent use of public transportation, where available. In addition, younger persons rely more on ridesharing and, this more technologically savvy generation, is taking advantage of the taxi mobile apps (e.g., Uber and Lyft) to reduce reliance on personally-owned vehicles. It follows that bicyclist and pedestrian injuries and fatalities are on the rise. An article published by the USDOT online – "Safer People, Safer Streets: Pedestrian and Bicycle Safety Initiative" – indicates that, since 2009, the 5-year trend for bicyclist fatalities rose to 726 fatalities by 2012 – the highest in the five-year period investigated. A similar trend was noted for pedestrian fatalities: a level of 4,743 fatalities was reached in 2012 – again, the highest number in the five-year period studied.

Many factors influence the choice of travel mode, and these factors are influential at different levels of a person's decision process. The FHWA identifies three essential factors: initial considerations, trip barriers (real and perceived), and destination barriers (real and perceived).

- **Regarding Initial Considerations:** Long-time reliance on the automobile mitigates against consideration; distance and time of travel is a major consideration; attitudes and perceptions about different modes influences choice; safety and security issues affect mode choice; and lifestyle decisions modify the viability of options.
- **Regarding Trip Barriers:** Safety of travel or the perception of safety is a primary influence on a person's mode choice; availability of avenues of travel free of impediments affect mode choice; intermixing with traffic or crossing traffic can create a significant mental barrier, if not physical barrier; negotiable routes are necessary for bicyclists and pedestrians in the same way roads provide a means of travel for motorized vehicles; and environmental factors, such as rain, snow, high temperatures are difficult to overcome for bicyclists and pedestrians.
- **Regarding Destination Barriers:** commuter bicyclists need a safe place to store bicycles and, depending on the ride, clean up; support from employers and coworkers can be important toward sustaining a regular practice of bicycle commuting; safe and secure parking facilities are needed at stores and public buildings; a lack of ramps and other infrastructure elements compatible with alternative modes at destinations may inhibited their use.

The framework of these factors is modified over time and specifically modified through the provision of adequate, safe, and convenient facilities. The goals outlined for this Element will aid in achieving a supportive framework that will lead to a more comprehensive transportation system for the City and a higher quality of life for all its citizens.

8.2 GOALS

The *City of Maricopa 2040 Vision Strategic Plan* identified six areas of strategic importance to the community that must be addressed to achieve the overall vision for the community and improve quality of life for its citizens. Within the context of these strategic areas, there are several goals and strategies that relate to pedestrian and bicycle travel, including:

- Relative to Land Use, the 2040 Vision statement recognizes the need to incorporate Parks, Trails, and Open Space planning with land use planning.
- Relative to Transportation and establishment of Parks, Recreation, and Leisure amenities, the 2040 Vision statement expresses:

- The need to establish and maintain a citywide trails and pedestrian plan.
- Develop a trails and bikeways system that connects parks, greenways, and commercial areas of the City.
- Creation of safe and functional pedestrian ways and bicycle routes through the City.
- Create reasonable connectivity among shopping and population centers by developing bike lanes along arterial roadways, wherever possible.

- Relative to Safe and Livable Community, the 2040 Vision statement calls for ensuring development of a proper ingress and egress infrastructure for efficient public safety that includes bicycle paths and pedestrians crossings.
- Relative to Environmental Stewardship and Flood Mitigation, the 2040 Vision statement encourages the implementation of means for reducing automobile use by increasing bicycling.
- Relative to Community Resources and Quality of Life Amenities, the 2040 Vision statement calls for a plan to create connectivity among developments through the construction of sidewalks, bike paths, and hiking trails.

8.3 TYPES OF TRAILS AND PATHWAYS

Today, there is a relatively extensive network of bicycle/pedestrian pathways developed within the City as a result of the City adopting Subdivision Regulations and Street Design Standards. An amendment to the Subdivision Regulations specifies that bike lanes "shall be provided on all arterial and collector streets."[18] Thus, within all new developments bike lanes have been provided on main collector roads and are being installed adjacent to arterial streets in satisfaction of the *General Plan*. Bike lanes are not designated on SR 347/John Wayne Parkway or MCGH.

As a result of the amendment to the City's Subdivision Regulations, which also requires the establishment of open space, there are extensive open spaces providing for a wide variety of activities, such as walking, sports, and neighborhood events. Trails have been developed generally for local use, connecting all new open spaces in compliance with the Subdivision Regulations. While many new trails and bike lanes have been created, full connectivity to community destinations or between neighborhoods and developments has yet to be established, but a foundational network has been established.

The PTOS establishes guidance for the City regarding a "Bike Friendly Community." The PTOS defines a new network of trails that has been coordinated with the Regional Trail System developed for Casa Grande, the Open Space and Trails Master Plan developed for Pinal County, and the Table Top Wilderness Trail Plan to create regional connectivity. Nineteen types of trails are defined in the comprehensive network adopted with the PTOS, which includes specialized infrastructure facilities or elements (Note: The terms "Trails" and "Paths" are used interchangeably).

[18] City Ordinance 05-07 adding new Section 407, Open Space Requirements and Design Standards, to Chapter 14, Subdivision Regulations.

TRAILS AND PATHS

- **Paved Paths and Wide Shoulder:** These are the predominant type of trails, which would be used by bicyclists, pedestrians, joggers, strollers, wheelchair users, in-line skaters, other non-motorized users, and anyone wanting a smooth and consistent surface.
- **Unpaved Trails:** These facilities would accommodate non-motorized multiple user groups such as mountain/recreational bicyclists, walkers, runners, hikers, equestrians and others who prefer a soft, natural surface rather than a hard paved surface.

- **Community Trails:** These trails fill the gap where conditions do no warrant multiple paved paths. This type of trail possibly could accommodate equestrian use.
- **Back Country Trails:** This type of trail is specifically defined for preserved open space or mountainous, non-developed, or protected areas such as the Haley Hills and Palo Verde Mountains, and the design is intended to minimize impacts of the physical trails as well as users of the trails.
- **Rural Neighborhood On-Street Trails:** The size of these trails (12-foot width minimum) is intended to support and maintain the equestrian heritage associated with adjacent neighborhoods.

SPECIALIZED SUPPORT INFRASTRUCTURE

- **Trailheads:** A trailhead is the point at which a trail or path begins; therefore, every trail or path has a formal, recognized trailhead. The PTOS defines seven different forms of trailheads, depending on accessibility, parking availability, supported users (bicycle, pedestrian, equestrian), and amenities (e.g., restrooms, shade structure).
- **Access Points:** This group of elements incorporated in the planned trail/path system represents areas where trails/paths may be entered or exited either by walking, riding, biking, or driving to convenient, safe, and well-equipped trailheads, i.e., a route to travel to/from a trailhead.
- **Entry Nodes:** This element of the PTOS represents the point of direct interaction with the trail/path, where amenities, such as benches, signs, water, shade, bike racks, and lighting (optional), serve to enhance the trail/path experience. The PTOS anticipates site-specific facility design that reflects a neighborhood identity, incorporates public art, expresses community culture, and provides opportunities for environmental interpretations.
- **Trail Crossings:** Specialized elements improve user safety, where trails/paths intersect streets, drainage facilities, utility corridors, and canals.
    - **Grade-Separated Crossings:** These are physical structural elements intended to separate trail/path users from potentially hazardous situations associated railroads, canals, rivers, washes, even streets with high traffic volumes by placing trail/path users at a different level from the facility they are crossing. Four types of grade-separated crossings are highlighted in the PTOS: Bridge Underpass, Pedestrian Underpass, Shared Bridge, and Pedestrian Bridge/Overpass. It should be noted that these crossings are not solely restricted to pedestrians, but each may have restrictions or constraints on permissible users, depending of purpose and design.
    - **Enhanced At-Grade Crossings:** This type of crossing includes special designs to provide trail/path users with greater security, comfort, and convenience, where grade separation is not

practical or is limited by the need to accommodate particular users, e.g., equestrian traffic. The PTOS highlights three types of enhanced at-grade crossing that may be incorporated into the trail/path system: Enhanced Signalized Crossings at major streets, Mid-Block Crossings to temporarily stop traffic for the passage of users of high-volume trails/paths, and Wash Low-Flow or Dip Crossings for drainage channels where it would not be feasible to create a grade-separated crossing and flows are small or infrequent.

8.4 BICYCLE TRAVEL

The USDOT has adopted a policy for incorporating safe and convenient bicycling facilities into the transportation planning process and improvement projects. The policy recognizes that every agency tasked with the development and maintenance of the Nation's transportation infrastructure has the responsibility to improve conditions and opportunities for bicycling and to move forward greater integration of bicycling into national, state, regional, and local transportation systems. It further recognizes and encourages the pursuit of minimum standards to achieve the individual and community benefits that bicycling provides — including health, safety, environmental, transportation, and quality of life. This section addresses the key aspect of a community's bicycling network and highlights important aspects relating to the establishment of a network consistent with the USDOT policy.

TYPES OF BICYCLISTS

There is no single, definitive method for defining the type of bicyclists in the community. Guidance developed by the American Association of the Highway and Transportation Officials (AASHTO) in 1999, which was based on an earlier report published by the FHWA, identified facility needs according to the skill level of the bicyclist. Advanced or experienced riders are comfortable operating in motor vehicle traffic and riding for convenience, speed, and directness of travel, such as the typical bike commuter. Basic cyclists are less confident about intermixing with motor vehicle traffic and tend to prefer designated paths or neighborhood streets where the less potential for conflicts. Children were seen as special category or type of bicyclist, whether alone or with an adult. Children needed to have well-defined paths and markings and were best served on residential streets.

A later report prepared by the City of Portland Office of Transportation took the AASHTO definitions a step further, settling on four types of bicyclists representing their perception of and relationship with the transportation system. Repeated surveys identified the "Strong and Fearless" bicyclist, who regularly travels by bicycle regardless of conditions, even when there is no designated facility or infrastructure for bicycling. "Enthused and Confident" riders are relatively comfortable sharing the roadway with motor vehicles, but they would prefer riding on separated facilities. The "Interested but Concerned" bicyclists like riding, but are intimidated by the potential for a crash with a motor vehicle, aggressive driver attitudes toward bicyclists, and fast-moving traffic. These are the occasional riders that steer clear of major thoroughfares on their trip through neighborhoods to the local park, store, or café, and they accounted for the greatest share of the surveyed population. Finally, the Portland study identified a group of persons labeled "No Way, No How," that are not interested in bicycling at all for various reasons.

Finally, Forbes Magazine Online published recently (August, 2013) an article regarding bicycling in European and American cities that divided riders into four groups according to their interest and commitment to traveling by bicycle. Three of the types of bicyclists identified in the article align closely with the Portland findings. "Dedicated Cyclists" are interested in speed, predictability, and flexibility or convenience and are least likely to be deterred from riding by weather or traffic conditions on streets

followed. The "Path-Using Cyclists" enjoy riding for its convenience and a certain status or identity associated with riding, but they prefer a continuous, dedicated route out of traffic. "Fairweather Utilitarians," by the very name, ride in good weather only and desire to have a dedicated bike path. Finally, there is the "Leisure Cyclist," who rides for fun, even camaraderie with family or friends, and they do not want to deal with motor traffic.

The Forbes article points out that the availability of dedicated bike paths in communities has resulted in an increase in the share of women riders from 35 percent in 2008 to 40 percent in 2013. Additionally, the average age of bicyclists has dropped over that same five-year period from 42 year olds in 2008 to 37.3 years old in 2013. Bicycling also seems to have become an interest of those with higher incomes. Thirteen percent of bicyclists in 2008 reported a household income of $100,000 or more. By 2013, this percentage jumped to 25 percent.

If anything is clear from the above findings, it is that a "one-size-fits-all" approach to developing a bicycle-supporting infrastructure will not necessarily encourage greater use of bicycles. Interested and fair-weather bicyclists, even those who have not used a bicycle in the past, may be encouraged through the touting of health benefits, but such a campaign will not likely affect the most committed cyclists, who ride for different reasons. Also, the most committed bicyclist does not have a strong interest in dedicated, separate bike trails/paths (although pavement markings are important), while other groups see bike trails/paths as important, almost essential. Overall, then, it appears that all types of bicyclists would benefit from a network of facilities that emphasizes convenience, flexibility, and speed.

BICYCLE FRIENDLY COMMUNITY DESIGNATION

The League of American Bicyclists (LAB), a non-profit membership organization that promotes cycling for fun, fitness and transportation, is dedicated to encouraging the provision of safe accommodations and facilities for bicyclists. The organization also is interested in encouraging residents of communities to bike for transportation and recreation. Toward this end the LAB has developed a rating system to grade the commitment of a community to improving and sustaining bicycling and bicycle safety by adopting active and supportive bicycle-related programs, plans, and policies. Communities apply for the LAB's "Bicycle Friendly" status by demonstrating commitment and progress toward attaining the "5 E's" associated with bicycle use, enjoyment, and safety:

- **Engineering** – Creating safe and convenient places to ride and park;
- **Education** – Giving people of all ages and abilities the skills and confidence to ride;
- **Encouragement** – Creating a strong bicycle culture that welcomes and celebrates bicycling;
- **Enforcement** – Ensuring safe roads for all users; and
- **Evaluation and Planning** – Planning for bicycling as a safe and viable transportation option.

Thus far, LAB has given the formal designation of Bicycle Friendly Community to 325 communities in all 50 states. These communities have developed and maintain safe accommodations and facilities for bicyclists and have a program in place to encourage residents to bike for transportation and recreation. The recognition is witnessed by the award of one of five designations: Honorable Mention (lowest), Bronze, Silver, Gold, and Platinum (highest).

In its support for bicycling, LAB has been instrumental in defining bicycle facilities as guidance for developing bicycle facilities and has defined four types of facilities that accommodate bicycle travel.

- **Shared Roadways (no specific designation):** This type recognizes bicycle travel on an existing street system, but there is no signing or striping for this particular use.

- **Signed, Shared Roadways:** There is bicycle use on an existing street system guide by signage, such as directional and informational markers, that designates the route of travel. Routes provide continuity of travel with other bicycle facilities (e.g., another route, bicycle lane, shared use path).
- **Bike Lanes:** This facility is a portion of a street or roadway specifically designated for bicycle travel with distinctive striping, signs, and pavement markings. Generally, the minimum width of a bike lane is five feet, although this can be determined locally.
- **Shared Use Paths (formerly Bike Path):** This type of bicycle facility is wide, generally 10 feet, and, while accommodating bicycle travel, supports travel by pedestrians, skaters, joggers/runners, wheelchair users (including wheelchairs with electric power), and other non-motorized modes of conveyance.

Consistent with the PTOS, a "Shared Use Trail" (formerly Multi-Use Path) also is recognized by bicyclists. This type of facility is an extension of the Share Use Path, but there are no restrictions as to user with particular emphasis on equestrian activities. The Shared Use Trail generally is 10 feet wide and may include a two-foot buffer zone on each side. This type of facility commonly is developed in natural settings and often through public lands, such as state parks and national forests.

BICYCLE TRAVEL TOOLBOX

This section identifies a "Toolbox" of potential treatments and strategies related to the "5 E's" that may be implemented to improve the conditions of bicycle travel with the City and Study Area.

NARROWING VEHICLE LANES TO ACCOMODATE BIKE LANES

A cost-effective way to add bike lanes on existing streets is to narrow the vehicle lanes, thereby freeing up space for bike lanes. Standard engineering designs of the past have established 12 feet for roadway travel lanes; narrower than 12 feet has been considered less safe and reduces roadway capacity. However, recent research associated with nationally recognized sources as well as some traffic engineering manuals indicate travel lane widths as narrow as 10 feet are acceptable on arterial and collector streets.

WIDENING BIKE LANES

The 2012 AASHTO Guide for the Development of Bicycle Facilities (4th Edition) provides the following guidance on bike lane widths:

- Recommended minimums –
  - Five feet, inclusive of adjacent vertical obstructions, such as curbs or guardrail.
  - Four feet if no adjacent vertical obstructions are present.
  - Four feet when bike lane is between a through lane and a right-turn lane.
- Preferred minimums –
  - Five feet when bike lane is between a through lane and a right-turn lane.
  - Six to eight feet may be desirable adjacent to on-street parking, in areas with high bicycle use, on high-speed (greater than 45 mph) and high-volume roadways, and on roads with a high number of trucks and buses.

REDUCING NUMBER OF TRAVEL LANES THROUGH A ROAD DIET

"Road Diet" is a term adopted to refer to removal of travel lanes on a roadway to utilize the space for other uses and travel modes. Generally, the reduction of lanes and resulting free space is committed to

establishing bike lanes, pedestrian refuge islands, transit uses, and/or parking. The Road Diet often is adopted to allow communities to create more "livable" spaces and opportunities for more and safer pedestrian movement, bicycling, and transit service. Benefits include reductions in motor vehicle speeds, additional turn lanes, decreasing pedestrian crossing distance and exposure, availability of a center of the street pedestrian refuge on wider roadways, and improving safety and convenience for bicyclists and transit users.

SHARED LANE MARKINGS

Roadways that carry low volumes of traffic, and/or where traffic typically operates at low speeds, may be suitable for Shared Lanes. Shared Lanes often provide an enjoyable and comfortable experience compatible with bicycling with no need for special accommodations. Shared lane markings, or 'sharrows,' indicate the standard traffic lane is to be shared with bicycles. A sharrow may be used on roadways where the addition of bike lanes is not feasible and where speed limits are no greater than 35 mph. The benefits of the sharrows are cited below:

"Sharrow" Roadway Designation

- Reinforces the legitimacy of bicycle traffic on the street;
- Provides a visual cue to drivers to be on the look-out for and yield to bicyclists;
- Aids in guiding bicyclists along the roadway; and
- Does not require physical alteration of the roadway or additional street space.

GREEN COLORED PAVEMENT

The FHWA issued in 2011 Interim Approval for optional use of green-colored pavement in marked bicycle lanes and extensions of such lanes through intersections and other traffic conflict areas as well as Shared Lanes. The Interim Approval indicates research has found the green colored pavement gives motor vehicle operators increased awareness of the potential that bicyclists might be present and where they are likely to be positioned. Since release of the Interim Approval, many communities across the country have employed green colored pavement to highlight bicycle lanes or potential bicycle/motor vehicle crossing points more visible to improve bicycle safety.

ROAD WIDENING TO ACCOMMODATE BIKE LANES

Many of the City's newer, wider arterials and collectors have a roadway right-of-way used to provide sidewalks, a landscaped buffer, streetlights, and utilities on both sides of the roadway. If bicycle lanes cannot be demarcated within the existing roadway pavement width, this non-roadway portion of the right-of-way could be narrowed to allow striping for a bicycle lane. Should road widening be undertaken, careful planning should precede the action to minimize adverse impacts to pedestrians and avoid potentially costly utility relocations. If there is insufficient space within the established right-of-way to widen the road, additional right-of-way would need to be acquired. However, roadway widening for the sole

purpose of creating bicycle lanes would be relatively expensive compared to other options; as such, it would be a solution for consideration only if other less expensive options are less viable.

SEPARATED (OR PROTECTED) BICYCLE LANES

Separated bicycle lanes (SBL), sometimes referred to as "protected bicycle lanes" or "cycle tracks" are physically separated from adjacent traffic lanes by a vertical element, forming an exclusive facility for bicyclists. As of May, 2015, the FHWA has formally adopted a policy supporting the use of this type of facility, indicating they have great potential to fill the need to establish in communities viable low-stress bicycle networks. The physical separation from vehicular traffic removes much of the insecurity and safety risks of on-street bicycle riding.

Typical Protected Bicycle Lane: Lake Street, Chicago, IL
(Green Lane Project of PeopleForBikes at www.peopleforbikes.org)

Common separators for SBL are curbs, medians, on-street parking, bollards, landscaping, or planters. The lanes can operate as a two-way facility, much in the same manner as a roadway accommodates two-way traffic. As a separate facility, SBLs can be integrated with turning traffic at intersections and may be constructed at a different grade than the adjacent roadway. This method of accommodating bicycle travel may be a viable approach along a roadway with few access points, sufficient right-of-way to allow bicycle lanes to be fully separated from motor vehicle traffic, and bicycle volume to justify the additional costs of essentially a stand-alone facility. SBLs may be appropriate for inclusion with a Road Diet project or traffic calming effort.

The minimum desired separation between the bicycle and adjacent motor vehicle traffic is three feet. The minimum recommended width for the bicycle lane is 5-7 feet; however, ultimate width would be determined subsequent an assessment bicycle travel demand, as this minimum width would accommodate a high volume of bicyclists. Maintenance of the SBL and vertical separator needs to be considered during planning and design phases, as well as the need for compliance with the Americans with Disabilities Act (ADA), accommodation of transit stops, and to access abutting properties by fire and emergency vehicles.

CONNECTIVITY WITH LOCAL & COLLECTOR STREETS

Local and collector streets are most supportive of a community bicycle network, because these facilities can accommodate bicycle routes that are more comfortable for casual and less confident riders. These streets are characterized by slower vehicle speeds and have lower traffic volumes than arterial streets. Connecting bicycle facilities on local and collector streets to local services and destinations increases the likelihood of convenient short trips. Direct connections from local and collector streets to off-street shared use trails/paths also would be supportive of safer bicycle travel by bypassing arterial streets. That is to say, connectivity at the neighborhood level enables people to take shorter routes and travel on quieter streets, which is more conducive to bicycling. A complementary "Wayfinding" program would provide support for navigating the network of bicycle facilities on local and collector streets. Wayfinding is modern jargon for knowing where one is located, where one desires to go, and having the information on how to get there.

OFF-STREET SHARED USE PATHS & TRAILS

Off-street shared use paved paths and unpaved trails have been fully discussed in Section 8.3. Techniques for developing and updating these types of facilities are noted below:

- Overlay the proposed future roadway network on a map of existing trails/paths, as presented in the PTOS;
- Identify gaps and needs within the trails/paths network;
- Develop recommendations for modified and new trails and paths;
- Review design standards adopted through the PTOS and recommended modifications or new design standards, as appropriate, based on state-of-the-practice information;
- Identify required rights-of-way to accommodate cross-sections existing, modified, and new trails/paths to guide future development planning and design review; and
- Prepare legal definitions to support enforcement.

SHARED USE PATH & TRAIL CROSSINGS

Shared use trails/paths and recommended actions to make trail/path crossings at streets, canals, railroad tracks, and drainage channels are discussed in Section 8.3. Trails or paths that intersect an arterial or collector street at mid-block pose a distinct safety hazard due to traffic operating at higher volumes and speeds than experienced at intersections. Therefore, several trail design considerations are recommended to maximize the safety and accessibility of trail-to-street intersections:

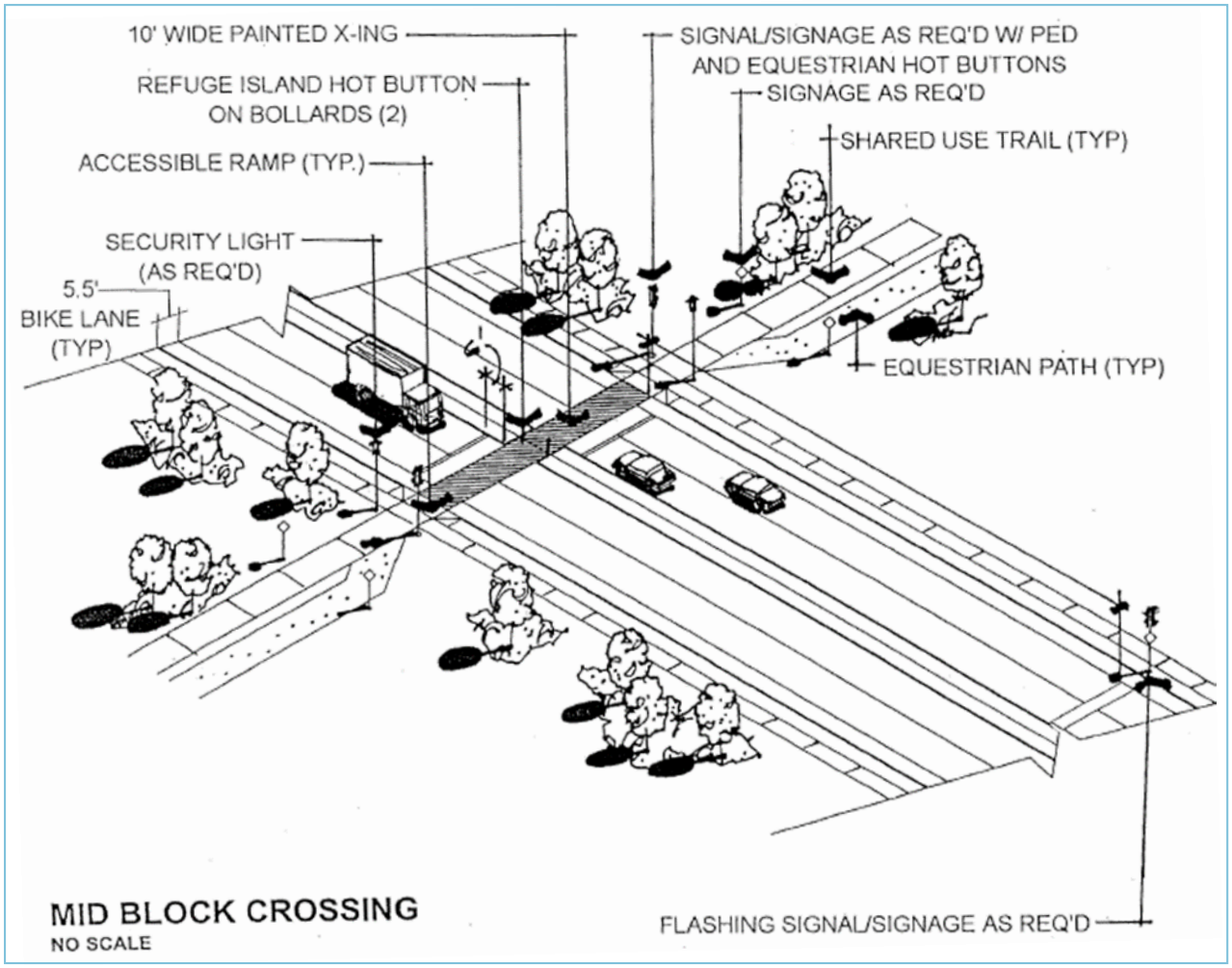
- Paths or trails should intersect the crossed roadway at a 90-degree angle;
- Trail width of the path/trail approaches to the intersection should be increased to reduce user conflicts;
- Sight lines for both motorists and trail users should be free of obstructing features;
- Appropriate signage should be provided to ensure motorists and path/trail users are aware of the upcoming trail of the roadway crossing;
- Provide a visible crosswalk at the intersection to increase trail user and motorist awareness.
- Path/trail and roadway signage should clearly indicate whether motorists or trail users have the right-of-way; and
- Use curb ramp materials, i.e., change of surface texture, to provide detectable warning of the approach to the roadway for path/trail users, especially those with physical impairments (e.g., vision or hearing)

It should be noted that raising the level of the road up to the level of the trail would eliminate the need for curb ramps, and the change in the roadway surface would create a traffic calming feature. This treatment, however, still would require a detectable warning (e.g., surface texture change or signal) to ensure users with physical impairments become aware of the approaching roadway intersection. Texture changes must take into consideration use of the path/trail by bicyclists and other wheeled modes (e.g., wheel chair) that could be destabilized by a rough surface texture.

Figure 8-1 provides an example of a typical mid-block path/trail intersection treatment with a four-lane roadway. This typical design adopted by the City of Gilbert, Arizona, has been used in several locations throughout the City. Other features may be included in roadway-path/trail intersection treatments. Two have been developed by the City of Vancouver, Washington. As shown in Figure 8-2, the Vancouver

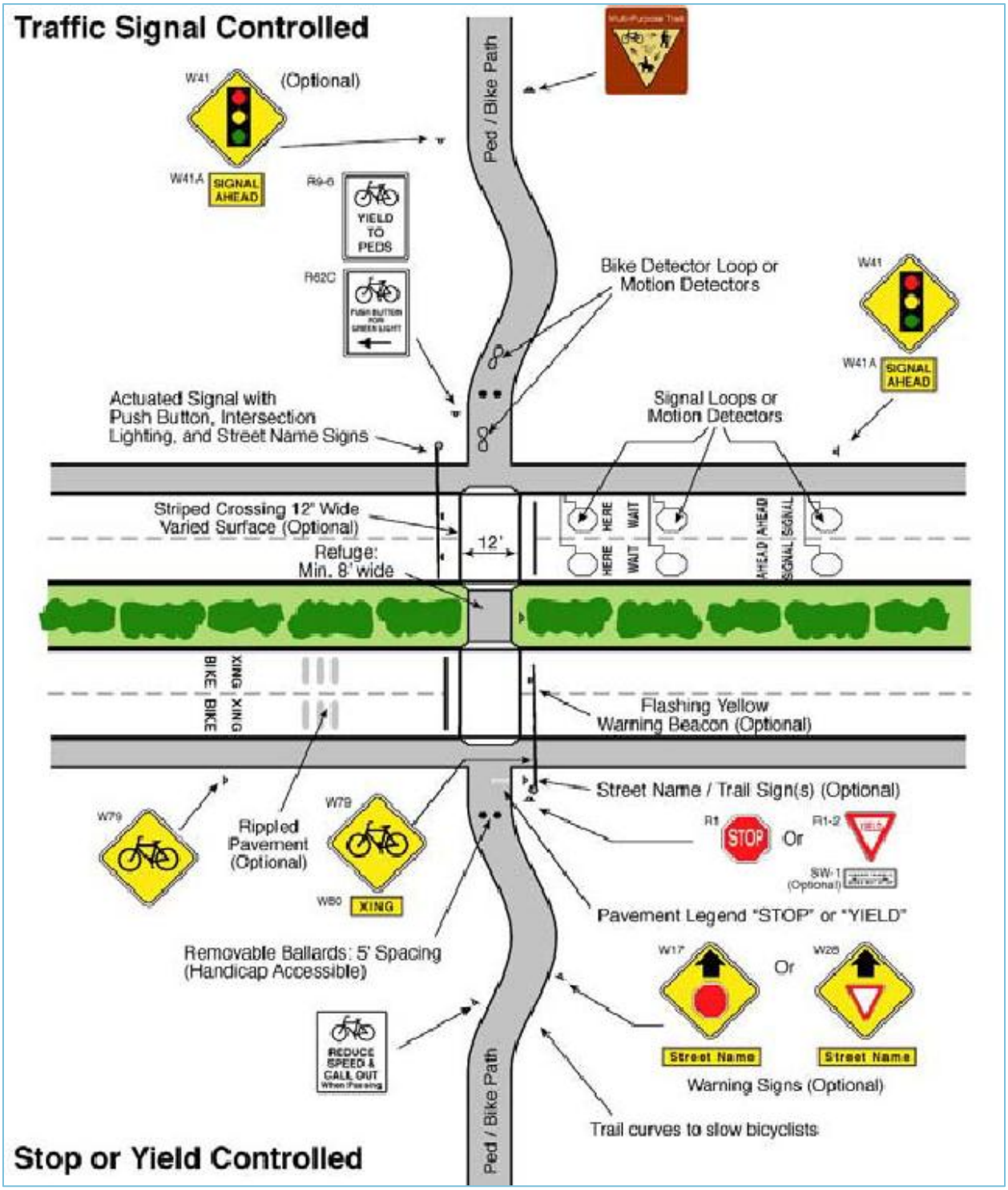
Signal-Controlled prototype includes a median for refuge and signal loops to detect path/trail users and alert motorists of the presence of the path/trail. The Stop or Yield-Controlled intersection prototype employs signage, a flashing warning beacon, and roadway pavement changes to focus attention on the crossing path/trail.

Figure 8-1 | Typical Mid-Block Roadway Crossing of Shared-Use Path/Trail



Source: Mid-Block Crossing, Town of Gilbert Standard Detail (Detail TR-11), Trail Design Guidelines, Town of Gilbert, Arizona, November 6, 2001.

Figure 8-2 | Variants of Controlled Path/Trail Crossing of Intersecting Roadway



Source: Path and Trails Element, Vancouver (WA) Walking & Bicycle Master Plan, City of Vancouver, Washington, January 2004.

BICYCLE SHARING PROGRAM

A bicycle sharing program permits a person for a small fee to pick up a bicycle at one hub station or public bicycle rack and drop it off at another. The objective of this type of transportation program is to make it affordable and convenient to use a bicycle as an alternative to a motor vehicle for short trips. This type of program is most effective in highly developed areas, such as downtowns and campuses, where a large number of short trips might be the norm. Bicycle sharing in these concentrated areas is viewed as having a high potential for reducing congestion, noise, and air pollution.

REGIONAL CONNECTIVITY & COORDINATION

The City's local and regional transportation system will need to adapt and expand to ensure viable connectivity with surrounding communities. System expansion should include appropriate growth of the network for bicycle travel. As a member of MAG, the City of Maricopa should coordinate growth of its bicycle network with the MAG *Regional Bikeway Master Plan* which includes a regional bicycle route south along SR 347 from I-10. Also, the communities of Goodyear to the west and Casa Grande to the east are establishing bicycle networks. The City plans should give consideration to linkages with these two neighboring systems.

EDUCATION

Education involves providing timely and comprehensive information to residents of all ages and abilities to foster full understanding of the transportation system and interaction of the various components, e.g., motor vehicles, bicycles, pedestrians, buses, trucks, and emergency vehicles. The intent is to foster the bicycling skills and confidence to fully optimize accessibility and mobility opportunities afforded bicycles in a highly mobile society. There are three important tools associated with an education initiative.

- **Safe Routes to School (SRTS) Program:** Incorporate into the SRTS Program advice and guidance for the proper operation of bicycles on city streets, near school grounds, and on school grounds;
- **Public Education and Training:** Implement public education and training programs focused on bicycle mobility, safety, and facility design. Training should include law enforcement officials, public works, and community development staff, school staff, and public officials; and
- **Regional Partnerships:** Partner with regional agencies, such as MAG, CAG, and Valley Metro to develop and implement public safety awareness campaigns relating to transit access by bicycle. The Designing Transit Accessible Communities (DTAC) Study completed by MAG provides substantial guidance for creating safer, more secure routes for bicyclists to/from transit stops.

ENCOURAGEMENT

Encouragement strategies associated with bicycling focus on safety, security, and convenience, as well health and social benefits. Numerous tools are available to stimulate and encourage residents to engage in bicycle travel; a few are cited below:

- Public safety awareness campaigns can include fliers, hangtags, rack cards (in English and Spanish), as well as radio and television announcements;

- Partner with regional agencies and bicycle advocacy organizations such as LAB, to expose residents (adults and children) to the possibilities and opportunities associated with bicycling;
- National Bike Month and Bike-to-Work campaigns can be sponsored to encourage workers and students to utilize a bicycle for the commute trip to work or school;
- Sponsor an outreach campaign to engage children, teenagers, and young adults in bicycling and bicycle safety with supporting actions, such as poster contests, coloring books, and messages on elementary, middle school, and high school marquees;
- Where distance, safety concerns, or a disability impedes opportunities to ride bicycles, communities can encourage riding in special safe areas, such as a school campus; and
- Implement a public service program that includes announcements about bicycle riding events, maps of bicycle networks, and associated amenities.

ENFORCEMENT

Enforcement of rules and regulations associated with the entire transportation system enhances the safety of bicyclists. Some tools available to improve enforcement are cited below:

- Training for enforcement officials, including police officers and park rangers, to improve their knowledge and confidence regarding laws relating to bicycle travel;
- Active and passive outreach efforts to create broader awareness of bicycle safety issues, such as safety messages on buses, radio Public Service Announcements (PSAs) in English and Spanish, banners, posters, as well as bumper stickers and brochures available at commonly frequented locations;
- Targeted enforcement programs aimed at bicycles and other transportation modes, as appropriate, that focus on unsafe behaviors, such as riding against traffic, speeding, riding through red lights, failure to yield to pedestrians, driving too close to bicyclists, bicycling without lights at nights, wearing dark clothes at night, distractions associated with a cell phone, and wearing headphones; and
- Establishment of a citizen committee to review and advise the City regarding planning, engineering, and maintenance of bicycle networks.

EVALULATION & PLANNING

Evaluation and planning for a comprehensive, connected, and safe bicycle network requires the coordination with roadway and transit networks. Therefore, a focused program must be established to permit the City to review and update information relating to bicycle movements and facility needs. Means for effecting a sound evaluation and planning program are noted below:

- Dedicate a portion of staff time to addressing issues and concerns related to bicycle travel;
- Establish a data collection and analysis program that facilitates identifying and prioritizing improvements for locations with a large volume of bicycle movements (e.g., schools) and implement surveys, as may be appropriate, to support long-term trend analysis of pedestrian needs –
    - Develop annual goals and performance measures that will allow the community to assess progress toward improving conditions for bicyclists; and
    - Utilize the Pedestrian and Bicyclist Intersection Safety Indices developed by the FHWA to identify intersection crossings and approach legs that need safety improvements;

- Ensure the components of the transportation network include appropriate markings and signage to inform motor vehicle operators of the presence of bicycles;
- Coordinate bicycle evaluation and planning with development and adoption of a Complete Streets ordinance or policy; and
- Implement policies or initiatives to promote safe, secure, and convenient bicycle facilities with design features and amenities that foster comfortable and attractive traveling environments.

OTHER BICYCLE STRATEGIES

Increasing bicycle use in communities largely is tied to the safety and convenience afforded the bicycle user during travel. However, Bicyclists have concern for the security of their rides, when the reach their destinations. A major lack in most communities is safe, secure, and convenient parking for bicycles at locations such as parks, community centers, libraries, shopping centers, and bus stops.

8.5 PEDESTRIAN TRAVEL

As with bicycling, the USDOT has adopted a policy for incorporating safe and convenient walking facilities into the transportation planning process and improvement projects. The policy recognizes that every agency tasked with the development and maintenance of the Nation's transportation infrastructure has the responsibility to improve conditions and opportunities for walking and to move forward greater integration of walking into national, state, regional, and local transportation systems. It further recognizes and encourages the pursuit of minimum standards to achieve the individual and community benefits that walking provides — including health, safety, environmental, transportation, and quality of life. This section addresses the key aspect of a community's walking network and highlights important aspects relating to the establishment of a network consistent with the USDOT policy.

PURPOSE OF A PEDESTRIAN ELEMENT

The purpose of this section is to provide long-term guidance relating to a program of improvements for pedestrian travel as an integral part of the City and Study Area transportation system. The section includes basic goals for establishing an integrated, comprehensive pedestrian travel network, presents a toolbox of options for improving pedestrian conditions, and makes recommendations for implementing a pedestrian network of sidewalks, shared use paths, and crossings of roadways to promote walking as a viable safe, comfortable, and convenient travel option.

MAG adopted a Pedestrian Plan in the Year 2000. The plan is reviewed and updated annually for determining funding under the regional Pedestrian Design Assistance Program. Nevertheless, the core of the plan remains consistent to the basic design objectives and performance guidelines intended to stimulate creation of better walking environments within the existing and new roadway network. The general structure of the MAG Pedestrian Plan goals and objectives is incorporated here to provide an essential perspective for improving the transportation system of the City and Study Area.

LAND USE

The pedestrian goal relative to land use is aimed at promoting and guiding development in a manner conducive to walking and implementing improvements that would stimulate a "mode shift" from individual automobiles to pedestrian travel, where reasonable and feasible. The relevant objective associated with this goal is to provide and maintain a pedestrian environment (i.e., network work paths and associated

amenities) consistent with the diverse needs of a walking population and having the assurance of a safe, convenient, and enjoyable experience.

PUBLIC AWARENESS

The benefits of walking are voiced in the USDOT policy cited earlier. The goal of Public Awareness relates to devising and implementing a variety of educational/informative programs and activities that actively and continually promote the benefits of walking. There are numerous ways to accomplish this goal, including:

- Construction of facilities that demonstrate the positive attributes of walking through innovative designs;
- Develop and implement public education and assistance programs that provide assistance and encouragement to people desiring to get out and walk;
- Promote walking programs that have incentives to stimulate interest in more pedestrian travel;
- Direct appropriate attention improving the understanding of persons traveling by other modes, particularly motor vehicles that the roadway needs to be shared with alternative modes of transportation with emphasis given to activity at intersections and roadway crossings; and
- Promote safe walking practices among all ages through initiatives to improve the observance of rules for crossing roadways and rules for yielding to non-motorized (including conveyances of disabled persons) travelers.

FUNDING

The goal of funding focuses on the need to support through adequate capital budget commitments development of a pedestrian travel network fully integrated with City and Study Area transportation system. This can be accomplished through initiatives to meet the following objectives:

- Provide dedicated and continuing funding for the construction of adequate pedestrian-friendly areas and facilities as an integral element of the City and Study Area transportation system;
- Dedicate a staff position or assign a staff member to oversee and coordinate pedestrian improvements and facilities to increase the reliance on walking relative to developed areas and developing areas;
- Adopt a criteria-based evaluation methodology (such as the Latent Demand and Roadside Pedestrian Conditions Model in the MAG Pedestrian Plan) for assessing potential pedestrian travel demand for gauging how proposed projects will improve walking conditions; and
- Promote pedestrian improvement projects through demonstration funding and publicize the beneficial attributes of the projects.

DESIGN FOR PEOPLE

Designing for people embodies the recognition the City and Study Area supports a diverse population. The design, construction, and maintenance of pedestrian facilities also should reflect the character, variety, and intensity of uses in the region. The objective is to have a comprehensive program that can be responsive to the needs of the various attributes of the population when new developments are undertaken or old developments are modified.

LINKAGE

The goal of attaining appropriate, effective, and efficient linkage seeks to coordinate the travel needs of pedestrians with both off-street (e.g., plazas, pedestrian zones, shops) and on-street (e.g., sidewalks,

paths, and trails) with other transportation modes. A few distinct objectives provide a framework for reaching this goal:

- Apply appropriate design performance guidelines to fully integrate appropriate pedestrian facilities into the planning, design, construction, and maintenance phases of the transportation infrastructure;
- Ensure an adequate linkage between the primary traveled ways developed for pedestrians and other pedestrian-oriented facilities, such as trails and shared use paths;
- Coordinate pedestrian accessibility and mobility needs with the planning, design, and construction of trails and paths; and
- Maximize the safety and efficiency of pedestrian connections with transit services.

WALK FRIENDLY COMMUNITY DESIGNATION

Similar to LAB, Walk Friendly Communities (WFC) is a national recognition program sponsored by USDOT that is modeled after the LAB program. It is focused on encouraging towns and cities to support safer walking environments. Recognition comes through application to and evaluation by the WFC, which examines a wide range of pedestrian-related conditions related to walking environment, including: Safety, Mobility, Accessibility, and Comfort. Like the LAB program, communities apply for the WFC's "Walk Friendly" status by demonstrating commitment and progress toward attaining the "5 Es" in the manner listed below:

- **Engineering –** Creating safe and convenient places and paths for pedestrians to move about secure from the fear of conflicts with other modes of transportation;
- **Education –** Giving people of all ages and abilities the skills and confidence to access and use pedestrian facilities in a safe and secure manner;
- **Encouragement –** Creating a strong community culture that welcomes and celebrates walking, running, jogging, and other forms of non-motorized travel;
- **Enforcement –** Ensuring safety procedures associated with pedestrians on trails/paths and roadways are regularly reviewed and enforcement policies are supported by adequate staffing and funding; and
- **Evaluation and Planning –** Planning for pedestrian travel through assessment of facilities and up-to-date planning methods to assure a safe and viable pedestrian network.

Thus, a "Walk Friendly" community receives recognition for addressing the four attributes or conditions affecting pedestrian travel and implementing the "5 Es." As this is accomplished with varying degrees of commitment and success, there are different levels of awards granted for different levels of achievement: Honorable Mention (lowest), Bronze, Silver, Gold, or Platinum (highest) level. As of the beginning of 2015, there were 55 WFCs designated in the Nation.

PEDESTRIAN TRAVEL TOOLBOX

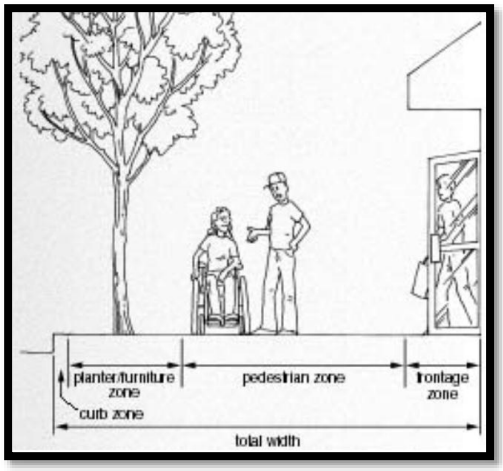
This section identifies a "Toolbox" of potential treatments and strategies related to the "5 Es" that may be implemented to improve the conditions of pedestrian travel within the City and Study Area. These tools may be applied toward retrofitting existing facilities, facility design changes when upgraded, and new facilities. Connectivity between sidewalks and shared use trails/paths and safe crossings of barriers, such as canals, roadways, drainage channels, and the maintenance of the connections will promote safe, secure, comfortable, and convenient pedestrian travel.

ENGINEERING

Engineering tools include physical and operational studies and projects to address basic safety and design issues associate with walking in various pedestrian environments (e.g., sidewalk adjacent to a roadway, shared use path, dedicated pedestrian area/plaza or safe zone.

Sidewalk Design

To better promote pedestrian safety and comfort, a minimum sidewalk width of five feet is recommended on the local street cross-section. Wider sidewalks should be installed near schools, at transit stops, in downtown areas, or anywhere high concentrations of pedestrians exist. A 6-foot sidewalk width particularly is preferred; the current City of Maricopa Subdivision Regulations includes this design standard for arterial and collector streets. If the sidewalk is in an area where persons in wheelchairs may be present, a wider sidewalk should be considered that would enable two people in wheelchairs (or wheelchair and bicycle or stroller) to pass one another. The additional width also would permit a wheelchair user to turn around more easily.

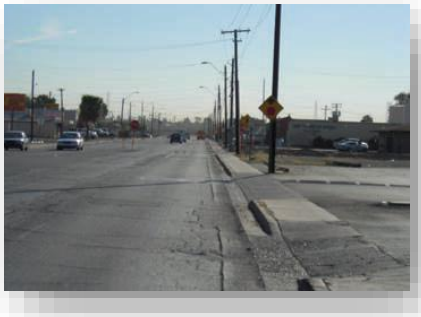


Network Length

This activity is coordinated with the following activity to provide a comprehensive assessment of the extent of sidewalks and paths and the degree to which there is or is not connectivity within the system and with origins and destination served by the system.

Sidewalk and Curb Ramp Inventory

An inventory identifies all relevant public pedestrian facilities either through field reconnaissance or with high resolution aerial photographs or both. Information is reviewed to create a dataset documenting the length, width, and condition of sidewalks. The dataset is then put to various analytical uses including:



- Analyzing existing pedestrian coverage (length) and connectivity;
- Recording existing hazards and potential hazards;
- Identifying needed improvements; and
- Establishing maintenance schedules and cost analyses.

Funding

This activity focuses on identifying appropriate available funding sources, preparing necessary application materials, and initiating required budgetary steps to support pedestrian network improvement projects.

Hazard Assessment

This assessment focuses on identifying hazards and potential hazards to pedestrian travel, including: broken or cracked sidewalks; vertical or horizontal misalignment of sidewalks resulting from heaving; impediments to use, such as vegetation or obstacles; broken or malfunctioning signals; damaged ramps (particularly important for persons with disabilities); and lack of markings and signs at a crossing. A

corollary activity to the hazard assessment may be establishing a reporting process affording residents the ability to provide real time information regarding the conditions of sidewalks, paths, and crossings.

Signal Design

The evaluation of signal design not only addresses the location but also the positioning relative to typical pedestrians. Signals should be accessible, meaning they provide sufficient information regarding WALK and DON'T WALK phases. Additional signal aspects of a walk friendly environment are:

- Ensure that signals are visible to pedestrians;
- When possible, provide a walk interval for every cycle;
- Provide supplemental non-visual guidance for pedestrians with sensory restrictions;
- Pedestrian push buttons must be well positioned and within easy reach for all approaching pedestrians, including persons in wheelchairs;
- Marked crosswalks should be installed in conjunction with pedestrian signals;
- Ideally, every signalized intersection should have a pedestrian signal head;
- Signal timing must consider the special operational needs of trucks, buses, and other motor vehicles;
- Signal timing needs to account for vehicle volumes, including volumes of right- and left-turns; and
- Illuminated crossings with heavy pedestrian traffic should have "No Turn on Red" signs.

Crosswalks

Crosswalk are identified as that portion of a roadway designated for use by a pedestrian or other non-motorized mode (e.g., bicycle, wheelchair) to cross a street. It is important to note that crosswalks are implied at all intersections whether or not the crossing is designated or marked. Mid-block crosswalks are identified and marked crossings that do not occur at intersections. Traffic engineering studies provide guidance regarding the need for, location of, and physical dimensions of crosswalks through the conduct of detailed warrant studies. Mid-block crossings should only be created when warranted by demand and should be appropriate marking and signage should be provided.

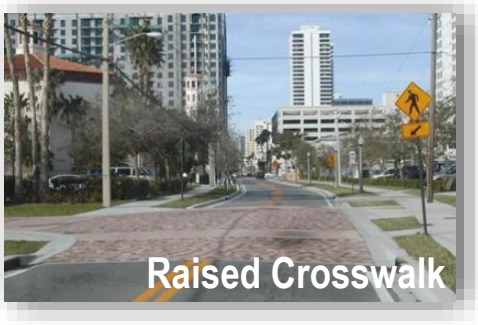
The following are general criteria to be satisfied in addition to warrant criteria, when considering installation of marked crosswalks:

- Marked crosswalks must connect to established sidewalks at both ends, and markings should be 12 in to 24 in (305 mm to 610 mm) wide and spaced 12 in to 24 in (305 mm to 610 mm) apart;
- A crosswalk should be striped as wide, or wider, than the walkway or sidewalk to which it connects to ensure groups of people can comfortably pass;
- Accessible ramps, as specified in the ADA, shall be included at both ends of crosswalk installations, unless there are engineering reasons such ramps cannot be provided;
- Adequate street lighting must be provided for the safety of pedestrians; and
- Street parking must be restricted adjacent to crosswalks to allow for adequate sight lines for both the motorists and the pedestrians.

Special crosswalk treatments should be considered when situations or conditions, such as an extra wide street or heavy traffic volumes, call for improving the safety of persons using the crosswalk. Specific treatments intended to reduce the exposure of pedestrians to traffic are highlighted below.

- **Bulb-Outs:** These are used to provide greater area for pedestrians and reduce the distance across the roadway to be traversed by pedestrians. When on-street parking is in the area, the bulb-out aids pedestrians by providing a better line-of-sight for on-coming traffic.

- **Center Median:** A center of the roadway median provides a refuge and are especially applicable to very wide streets.
- **Flashing Yellow Lights:** Lights that flash are most appropriate where awareness of the crosswalk needs to be increased for the motorist, particularly at mid-block crossings and where there is a heavy volume of pedestrian traffic.



- **Raised Crosswalks:** This type of treatment provides two benefits: it increases the visibility of the crosswalk and pedestrians using it, and it acts as a traffic calming feature by forcing a decrease in vehicle speeds.
- **Structural Grade Separation:** This treatment is justified where there is a heavy volume of pedestrian traffic and an at-grade crossing cannot accommodate pedestrian movement without significant interference with traffic flow.
- **HAWK:** The HAWK, a **H**igh intensity **A**ctivated cross **W**al**K**, is a pedestrian-activated signal system, often installed at mid-block locations on roadways with heavy traffic volumes. Heavy pedestrian volumes generally justify installation of the HAWK as well. The signal activates overhead flashing lights that alert drivers there are persons using the crosswalk, then stops traffic to allow pedestrians (and bicyclists) to cross.

Traffic Calming

There is a diverse array of design treatments and technologies that can be employed to promote walkability that can be considered during planning and design stages of improvement projects. It is a method of designing streets that provide physical and visual cues to encourage motorists to drive more slowly. Several potential treatments are highlighted below:

- Curb Radius Reductions
- Partial and Full Street Closures
- One-Way to Two-Way Conversions
- Traffic Lane Narrowing/Reduction – "Road Diet"
- Speed Humps/Tables
- Surface Treatments
- Roundabouts
- Traffic Circles
- Serpentine Design
- Chicanes
- Diverters
- Gateways
- Chokers

Geometric Features and Attributes

Geometric features and attributes of pedestrian facilities and crossings consider observable characteristics including: roadway cross-section, number of lanes of traffic, approach legs, type or function of facility, type of traffic control, traffic volume, and turn lanes.

EDUCATION

Education involves providing timely and comprehensive information to residents of all ages and abilities to foster full understanding of the transportation system and interaction of the various components, e.g., motor vehicles, bicycles, pedestrians, buses, trucks, and emergency vehicles. The intent is to foster the skills and confidence to take advantage of the accessibility and mobility opportunities afforded pedestrians in a highly mobile society. Three important tools associated with an education initiative include:

- Implementation of a SRTS Program or expand an existing SRTS Program to more schools.
- Implementation of education and training programs related to pedestrian mobility, safety, or design. Training should be provided for law enforcement, public works, and community development staff, school staff, and public officials.
- Partner with regional agencies, such as MAG, CAG, and Valley Metro to develop and implement public safety awareness campaigns relating to transit access. The DTAC Study completed by MAG provides substantial guidance for creating safer, more secure pedestrian routes to/from transit stops;
- Emphasize motorist awareness of bicyclists, particularly relative to turning vehicles at intersections, driveways, trail crossings, and near bus stops.

ENCOURAGEMENT

Encouragement strategies focus on having fun, generating excitement and interest, and walking for enjoyment and associated health and social benefits. Numerous tools are available to stimulate and encourage residents to engage in pedestrian activities; a few are cited below:

- Special events, mileage clubs, contests and ongoing activities all provide ways for parents and children to discover, or re-discover, that bicycling is do-able and a lot of fun;
- Walk to School Days involve an entire whole school in taking one day off from the usual travel routine to join in the parade of children walking to school;
- Park and walk campaigns encourage students and workers to extend the distance from the usual parking location to their destination by simply parking further out or in a group program parking at a designated location, then walking to the destination; and

- Where distance, safety concerns, or a disability impedes opportunities to walk, communities can encourage walking in groups in special safe areas, such as a school campus;
- Implement a public service program that includes announcements about walking events, maps of pedestrian networks and associated amenities.

ENFORCEMENT

Enforcement of rules and regulations associated with the entire transportation system enhances the safety of pedestrians. Some tools available to improve enforcement are cited below:

- Training for enforcement officials, including police officers and park rangers, to improve their knowledge and confidence regarding laws relating to pedestrian travel.
- Active and passive outreach efforts to create broader awareness of pedestrian safety issues, such as safety messages on buses, radio PSAs in English and Spanish, banners, posters, as well as bumper stickers and brochures available at commonly frequented locations;
- Targeted enforcement programs aimed at pedestrians and other transportation modes, as appropriate, that focus on unsafe behaviors, such as: jaywalking, speeding, riding through red lights, failure to yield to pedestrians, distracted driving, wearing dark clothes at night, distractions associated with a cell phone, and wearing headphones; and
- Establishment of a citizen committee to review and advise the City regarding planning, engineering, and maintenance of pedestrian networks.

EVALULATION & PLANNING

Evaluation and planning for pedestrian accessibility, mobility, safety, comfort, and convenience requires casting a broad net over many community functions and activities, because every trip involves a pedestrian movement at the beginning and end. Therefore, a comprehensive program must be established to permit the City to review and update information relating to pedestrian movements and facility needs. Means for effecting a sound evaluation and planning program are noted below:

- Dedicate a portion of staff time to addressing issues and concerns related to pedestrian travel;
- Establish a data collection and analysis program that facilitates identifying and prioritizing improvements for locations with high pedestrian counts (e.g., schools, shopping centers) and implement surveys, as may be appropriate, to support long-term trend analysis of pedestrian needs;
- Ensure the ADA Transition Plan is up to date and addresses key components of the pedestrian network, including the presence, design and condition of: sidewalks, curb ramps, crossing signals, crossing markings, and signage;
- Coordinate pedestrian evaluation and planning with development and adoption of a Complete Streets ordinance or policy; and
- Implement policies or initiatives to promote safe, secure, and convenient pedestrian facilities with design features and amenities that foster comfortable and attractive walking environments.

8.6 FISCAL YEAR (FY) 2012-2016 CIP BICYCLE- & PEDESTRIAN-RELATED PROJECTS

The City's CIP for Fiscal Year (FY) 2012-2031 identifies planned capital expenditures for various city-provided services and facilities. Planned expenditures for bicycle- and pedestrian-related improvements and projects are shown in Table 8-1.

Table 8-1 | Planned Capital Expenditures for Bicycle- and Pedestrian-Related Projects

Expenditure Item	FY 2015*	FY 2016*	FY 2017-31*
Santa Cruz Wash Trail System Construction	--	--	$13,300,000
Santa Rosa Wash Trail System Construction	$1,200,000	$450,000	$950,000

* Current dollars.

Source: City of Maricopa Capital Improvement Plan FY 2012-2031

9.0 TRANSIT ELEMENT

Public transportation services and facilities support travel within the City for residents, who do not have the option to drive, or who choose not to drive. The currently available City-operated COMET bus transit system provides DR service and limited fixed-route service with 3/4-mile deviations. Nine locations are connected during regular operation of the fixed-route buses. In addition, the City on Tuesdays and Thursdays affords residents opportunities for travel to the Dignity Health Chandler Regional Medical Center in the Phoenix metropolitan area and Banner Casa Grande Medical Center through its Regional Shuttle service. Both shuttles provide connections with other transit services at these two destinations. Also, the Valley Metro vanpool program provides commuters with direct connections to locations in the Phoenix metropolitan area.

These public transit services enhance the mobility and connectivity of City residents. In addition, the use of public transit provides localized and regional air quality benefits by reducing the number of personal automobiles on the Study Area roads, particularly during congested travel periods and times of the year when stagnant air movement is the dominant weather condition. As additional development in the City and Study Area occurs, the importance of an efficient and effective public transit system needs to increase as a means to mitigate attendant growth in personal automobile travel. This means added attention needs to be given to expanding local services and improving linkages with regional destinations to accommodate the increased interaction of a dynamic and diverse population.

The Transit Element addresses general and local issues related to the provision of public transit in the community and establishes basic guidelines and goals for improvement of transit services. The needs of City residents, particularly those who cannot drive — children, the elderly, persons with disabilities, and those who cannot afford a car — are examined to provide a basis for identifying appropriate improvement strategies and projects. This Element of the TMP also identifies priorities for improving transit services and facilities and discusses future policy considerations as the community moves into the future.

9.1 TRENDS IN TRAVEL BEHAVIOR

The advent of the personal automobile had a severe impact on public transit ridership in the United States and elsewhere. Public transit ridership peaked at 23.5 billion trips in 1946. Following the end of World War II and the mass migration to suburban communities, a general decline in public transit use was experienced. The highest ridership in 57 years was reported in 2013 by the American Public Transportation Association (APTA), when 10.7 billion trips were reported by operating agencies. The rise in public transit ridership has occurred steadily since 1995. In the 18-year period from 1995 through 2013, ridership increased at a rate almost double the population growth of the nation (37.2% v. 20.3%). APTA attributes the increase in public transit use to the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA), landmark federal legislation, and other supportive surface transportation legislation that increased funding for public transportation facilities, service, and equipment.

In recent years, ridership trends reflect a growing demand for public transit service by those desiring to take advantage of expanded services being provided through the additional funding. Two phenomena are particularly apparent: a desire by the Millennial generation for travel options to the automobile; and, a trend manifested by the Baby Boomers to return to the

core areas of the nation's cities and towns, where transit is more readily available. New York City historically has experienced very high public transit use, and ridership there continues to grow. But, APTA notes that, since the end of the most recent recession in 2009, 59.3 percent of public transit ridership has occurred outside of New York City. This is viewed as a manifest response to cities investing heavily in expanding the frequency and quality of public transit services. Increased use of transit services also is associated with the adoption of TOD policies, particularly in association with rail transit services that encourage new development activity – especially mixed-use residential and commercial developments – in the vicinity of transit centers and transit system stations.

9.2 GUIDELINES FOR NEW & EXPANDED SERVICE

Public transit benefits those who take advantage of system services as well as the people who do not use the services. If public transit service is available, it factors into questions of mode choice for work, shopping, and leisure trips. When public transit is not available, which is the case for 45 percent of American households, it cannot be used for any travel. Without transit services, residents must rely on the privately-owned vehicles (POVs), which adds to the burden of the roadway network and require additional capital investments for maintenance and new construction. Investments in public transit services of the past two decades have provided needed capacity and improved the overall efficiency of the transportation system as a whole, allowing more residents to opt out of POV travel.

Many cities are reaping benefits from increased ridership, and focused capital investments are rewarding cities with measureable economic growth:

- Investments in a multimodal transportation system focuses on moving people not vehicles and, therefore, tends to improve the usage of existing transportation facilities, removing the need to construct new facilities;
- The ability to select the appropriate mode for each trip creates efficiencies in the transportation system and often aids in safer travel;
- Reducing travel by POVs (more often than not a vehicle with a single occupant) reduces congestion, lowers emissions, and aids in improving air quality;
- A multimodal system addresses the inequity of travel limitations imposed on persons with physical issues that affect mobility by a system focused on the POV;
- Encouraging and enhancing multimodal transportation includes supporting travel by pedestrians and bicyclists, which enhances the physical health and well-being of a community's residents; and
- The objectives of Complete Streets, discussed earlier, embrace improvements in quality of life through improvements in the ability for enhanced social interaction.

These benefits are the thrust of current efforts by communities to maintain the momentum of past investments and work even more diligently to create a true multimodal transportation system that is responsive to the travel needs and desires of all persons regardless of age or abilities. It follows that new and expanded transit services should be examined and considered to make modal choice a way of life for all residents rather than a singular mode of transportation for those without other means of travel.

GENERAL TRANSIT DEVELOPMENT GUIDELINES

To reach the goal of an efficient, safe, and equitable multimodal transportation system, a realistic set of guidelines for action need to be developed and adopted to aid in decision-making as the system grows and changes. The creation of this TMP is an important first step, as it provides a comprehensive view of the City

of Maricopa and its transportation system needs. Three general guidelines support creation of a transit-supportive transportation system.

- **Modal Emphasis:** The concept of Modal Emphasis focuses on identifying one or more transportation modes that are most relevant to motorized and non-motorized travel in a corridor or area. It complements the concept of Complete Streets, but allows for certain modes to be developed consistent with the modal needs of the local area or region. That is to say, certain design features to accommodate one or more modes may be emphasized, while other modes may not be optimized although included. For example, in areas more densely developed, pedestrian, bicycle, and public transit travel may be emphasized, although movements of automobiles and trucks would not be excluded.
- **Multimodal Centers:** Multimodal Centers may be thought of as smaller, more concentrated areas of the community, where a high degree of multimodal activity and connectivity takes place. Although these centers may be characterized by a high volume of pedestrian trips, a high degree of connectivity with other travel modes is critical to travel into and out of the area. Public transit offers the means for accommodating a high volume of travel that begins and ends with pedestrian, even bicycle, movements.
- **Multimodal Corridors:** The intent of multimodal planning is to incorporate, to the extent feasible, all travel modes. In this manner, the goal of Complete Streets to assure safe and efficient mobility opportunities for person of all ages and abilities is complemented. Multimodal Corridors are defined by integration of the best connections for each travel mode to various destinations. Destinations in many cases would be the Multimodal Centers, which reflect concentrations of social and economic interactions. As Multimodal Corridors are envisioned and planned, Modal Emphasis becomes an important consideration. Whereas, automobile travel is critical to travel in certain areas of the community, such as residential areas, transit travel becomes more reasonable and feasible for regional linkages when there is a large travel demand between centers or areas. Thus, although automobile travel is not eliminated, corridor planning projects reflect full integration of transit services, such as Bus Rapid Transit (BRT), HOV Lanes, even LRT or Commuter Rail.

SYSTEM DEVELOPMENT GUIDELINES

The initial step to addressing potential public transit system improvements is the assessment of purpose and need. This assessment evaluates mobility issues and travel demand in the community relative to its population, employment, employment centers, and activity centers, as well as general land use patterns. The purpose and need assessment provides guidance relating to the type of service and needed capacity of the transit system. The assessment should support formulation of a clear statement of need and the desired goal or outcome for potential transit solutions. The various transit modes described that follow likely will be appropriate for the City of Maricopa to consider during the period of this TMP. These descriptions are provided to create a general framework for planning and program deliberations for new and expanded public transit service in the future to accommodate travel needs of the community.

COMMUNITY-ORIENTED TRANSIT

- **Light Rail Transit (LRT):** LRT systems involve the operation of electrified passenger rail cars operating in short (usually one, two, or three) consists (or trains) within a non-exclusive guideway that may or may not be separated from other traffic in the corridor of travel. LRT trains typically have stops with one-half to one mile separation, although closer stops may be established in densely developed areas, such as downtown and major activity areas. The specific physical and

operating characteristics, as well as cost, of an LRT system will be influenced by a variety of unique factors, reflecting the level of service desired and area served. The Phoenix metropolitan area currently has 20 miles of LRT service in operation, with an additional 8.1 miles planned to be operational by 2016 (see photo at left). Planning for 32 more miles of LRT and other high-capacity transit services is underway. It would be appropriate to include this type of service in future discussions of commuter connections between Maricopa and the Phoenix metropolitan area along SR 347. LRT service also would be a candidate for extended all-day and weekend service between the two urbanized areas.

- **Commuter Rail:** Commuter Rail trains (also referred to as Metropolitan Rail, Regional Rail, or Suburban Rail) may be electric or diesel propelled and provided passenger service of longer distances with fewer stops than LRT (see photo of New Mexico "Rail Runner" at right). This type of service generally connects a central city with adjacent suburbs, and operations usually are designed to accommodate peak-hour commutes with less frequent service during off-peak hours. Commuter Rail service typically operates, where feasible, on existing freight railroad tracks or adjacent to the tracks, either through acquisition or under an operating agreement with the railroad. The MAG *Commuter Rail Strategic Plan* (2008) identifies five Sub-Areas defined to focus the regional Commuter Rail planning activity. The South Sub-Area extends from Tempe into Pinal County, encompassing Maricopa and Casa Grande. A potential direct connection between the proposed Tempe Branch and the UPRR Sunset Line in Maricopa is envisioned. Potential Commuter Rail service for the City of Maricopa has been incorporated in the MAG 2030 RTP vision plan, which means such service has real possibilities of being developed, although the timing may go well past 2030 and even the planning horizon of this TMP. Nevertheless, it would be appropriate to include this type of service in future discussions of commuter connections between Maricopa and the Phoenix metropolitan area along SR 347.

- **Bus Rapid Transit (BRT):** BRT provides limited-stop service operating on a fixed route along exclusive transitways, HOV lanes, and/or freeways/expressways to help speed up service. BRT service also can operate on city streets when special stops are created to permit level entry/exit of the vehicle. A limited number of stops are established in the service areas at each end of the route to eliminate the delays associated with regular route service with more frequent stops. A BRT line may employ ITS technology, priority operations, rapid and convenient fare collection (often prepaid), and integration with land uses in the travel corridor upgrade bus system performance. A BRT line often is seen as a competitive option to LRT or a predecessor to an LRT line. Although the initial capital cost of LRT vehicles is significantly greater, more BRT vehicles are required to provide the passenger capacity of the LRT service; therefore, operating costs are higher for the BRT service. LINK service (as shown in the accompanying photo), connecting areas of

the Southeast Valley in the Phoenix metropolitan area to METRO Light Rail stations on Main Street in Mesa, is a BRT system. It would be appropriate to include this type of service in future discussions of commuter connections between Maricopa and the Phoenix metropolitan area along SR 347.

- **Express Bus:** Express Bus service is oriented towards providing more efficient and faster travel for longer trips during the peak commuting periods. Like BRT, Express Bus service is operated as a limited-stop route, but Express Bus service generally does not benefit from the special physical or technological advantages often afforded BRT service. Express Bus service is especially useful in large, sprawling urbanized areas and often will be coordinated with Park-and-Ride facilities. Express Bus service typically commands higher fares, due to time and convenience factors and distance traveled by passengers. Some Express Bus vehicles have passenger amenities typical of Intercity Bus service (or even tourist buses), such as plush seats and restroom facilities. As noted earlier, the City of Maricopa recently operated the maricopaXPRESS, or MAX, service under a demonstration program: one route went to Downtown Phoenix, the other went to Downtown Tempe and ASU. Valley Metro currently operates 14 Express Bus routes in the Phoenix Metropolitan area; this is down from 20 routes operated in 2009, prior to cuts due to revenue reductions associated with the Great Recession. It would be appropriate to again consider this type of service in future discussions of commuter connections between Maricopa and the Phoenix metropolitan area along SR 347.
- **Local Bus, Feeder Bus, and Circulators:** Local Bus service supports regularly scheduled fixed-route operations with frequent passenger stops (i.e., every block or two). Routes generally are several miles long, oriented to local streets and roadways, and serve multiple origins and destinations. Bus service limited to a small geographic area, short-distance trips, or activity centers (e.g., downtown) often is referred to as Circulator service. This type of service generally commands a lower fare than the Local Bus service, as the service is more focused and smaller buses are employed. Circulator "loops" often are established to connect a particular area with a Transfer Center or Rail Station for extended travel opportunities. Two operating aspects of the City's COMET transit service are of this type of service: Limited, Fixed-Route Service within Maricopa, Monday through Friday in the morning and afternoon; and the Regional Shuttle, which effectively is "loop" service between the Dignity Health Chandler Regional Medical Center in the Phoenix metropolitan area and Banner Casa Grande Medical Center in Casa Grande on Tuesdays and Thursdays, respectively. Feeder Bus service often is developed with an orientation to Express Bus, BRT, or even rail stops/stations, affording residents direct travel to the more regionally oriented and faster transit services. It would be appropriate to consider establishing these types of services in future discussions of public transit service in the City of Maricopa.
- **Demand Response (DR):** DR service typically employs small buses or vans dispatched by the transit operator in response to requests for transportation from passengers or their agents. DR service generally does not operate on a fixed-route or fixed schedule, per se, although route-deviation options sometimes are offered within the definition of fixed-route service to accommodate the special travel needs of the community. Typically, the DR vehicle is dispatched to pick up a specific client or passenger or multiple passengers at different pick-up points. The bus then transports each passenger to their respective

destination. DR service may involve: many origins & many destinations; many origins & one destination; one origin & many destinations; or one origin & one destination. The City's COMET transit service provides local DR service five days a week. This service recently was expanded to meet increasing demand. It would be appropriate to consider continued efforts to improve and expand this type of service in future discussions of public transit service in the City of Maricopa.

REGIONAL AND INTERSTATE PUBLIC TRANSPORTATION

- **Intercity/Interstate Rail:** Amtrak provides passenger service through Maricopa. Amtrak is an interstate rail passenger service providing service through 500 stations over 21,000 route miles in 46 states. Amtrak service offers an energy efficient travel mode that connects directly with Southern California and indirectly with the Midwest and Northeastern United States.
- **Intercity Bus:** Intercity Bus service is privately-owned and operated. This service operates in mixed traffic on local streets and highways, connecting large urban areas, smaller cities, and other destinations. The buses are designed for high-speed, long-distance highway travel, but sufficiently maneuverable to travel through densely developed areas, such as downtowns. The vehicles also are outfitted with amenities, such as individual lighting, plush seats, power outlets, and restrooms, to assure more comfortable travel over longer distances. Private Intercity Bus services responds to market demand; therefore, availability will vary by operator and market. Greyhound, the largest operator in North America, has a station in central Casa Grande. As the population of Maricopa increases, demand for Greyhound bus service may stimulate expansion the City. It would be appropriate for the City to establish and maintain contact with Greyhound in continuing efforts to improve and expand travel opportunities for community residents.

9.3 GOALS

The City of Maricopa has embraced the "Smart Cities" initiatives as a path for enhancing the performance of City facilities and infrastructure, reducing costs and resource consumption, and engaging more effectively and actively with its citizens. The Smart Cities initiatives integrate technology and government with the intent to empower planning efforts and infrastructure development to create a more attractive and efficient city for residents, visitors, and businesses/employers. "Smart Cities" is an integral aspect of the *City of Maricopa 2040 Vision Strategic Plan* adopted by the City Council in May 2015. The *City of Maricopa 2040 Vision Strategic Plan* embraces six Vision Elements comprised of goals, rationale, and strategies establishing pathways for fulfilling the vision for the City. Items specifically relevant to public transit services and facilities are highlighted below.

- Relative to Well Planned Quality Growth and Development, the 2040 Vision statement:
    - Establishes under Land Use the goal of ensuring land uses are compatible with transportation corridors laid out and defined by the General and Master Plans. With respect to public transit, the specific strategy is to consider high-volume transit service corridors as opportunities to stimulate and support commercial and employment.
    - Establishes under Transportation the goal of a multimodal transportation system that is safe, functional, and integrated with the objectives of "Smart Cities" initiatives, with the understanding that improved mobility opportunities will foster greater economic growth. Respecting public transit service, specific strategies focus on:

    - Providing greater, more efficient mobility options through a multimodal transportation system, especially regarding regional connectivity with the Phoenix metropolitan area through the expansion of express bus service;
    - Expanding Park-and-Ride opportunities;
    - Expanding the local, feeder bus, and circulator services to connect key activity centers;
    - Exploration of high-speed, high-capacity travel modes for improved connectivity with the Phoenix metropolitan area;
    - Develop SR 347 as a "mobility corridor" capable of supporting future LRT service connections to the Phoenix metropolitan area; and
    - Foster regional partnerships to support integrated transportation solutions.
  - Establishes under Environmental Stewardship and Flood Mitigation the goal of improving air quality with a supporting strategy of encouraging means to reduce automobile use through mass transit options connecting with the Phoenix metropolitan area.

- Relative to Community Resources and Quality of Life Amenities, the 2040 Vision statement:
  - Establishes under Parks, Recreation, and Leisure the goal of creating and maintaining a connected system, which includes a strategy to plan for connectivity of developments via sidewalks, bike paths, and hiking trails. A greater degree of connectivity established will benefit transit service access throughout the community.
  - Calls for stimulating expansion of a variety of healthcare services as a goal that is supported by a strategy to facilitate placement of complementary health care services in concentrated areas, such as group medical buildings and plazas. This strategy would be supportive of a more efficient public transit system by creating centers of activity more easily serviced by buses.

9.4 REVIEW OF RELEVANT PLANS & STUDIES

This section provides a summary of previous plans relating to or potentially providing guidance for the implementation of transit services in Maricopa and highlight specific improvement proposals.

CITY OF MARICOPA TRANSIT FEASIBILITY REVIEW AND IMPLEMENTATION PLAN, JULY 2007

This study by ADOT recommended initiating neighborhood Circulators and Dial-A-Ride or DR service. Today, the City operates DR service, Fixed-Route Circulator, and a Regional Shuttle service, as described earlier. The ADOT Feasibility Study supported the potential for commuter-hour transit service in the SR 347 corridor as a means of reducing the number of privately-owned, single-occupancy vehicle (SOV) trips. It recommended implementing pilot routes to aid in evaluating the feasibility of Express Bus service to destinations in the Phoenix metropolitan area. The Feasibility Study also encouraged the City to implement a TOD overlay district to promote development of transit services through land use patterns that support compact (i.e., denser), walkable areas more compatible with potential implementation of high-capacity transit operations in the SR 347 corridor, such as BRT, LRT, and Commuter Rail. ADOT also recommended the City of Maricopa enter into a regional organization structure that would provide greater opportunities for developing public transit services and offer a broader range of transit services, including the Commuter Rail option connecting with the Phoenix metropolitan area.

In direct response to recommendations of the Feasibility Study, two pilot routes were identified for implementation: the Downtown Phoenix Express and the South Chandler Connector. The South Chandler

Connector ultimately could not be accommodated by the City of Chandler. Therefore, the City of Maricopa entered into an Intergovernmental Agreement (IGA) with the City of Tempe (the second highest destination for Maricopa residents) to permit a similar service to be initiated. The new pilot transit service to the downtown areas of Phoenix and Tempe/ASU was marketed under the name MAX, for maricopaXPRESS. The two routes were discontinued at the end of the designated time frame for the pilot project.

PINAL COUNTY TRANSPORTATION INVESTMENT STRATEGY, JUNE 2008

This adopted public transportation investment strategy adopted by Pinal County identifies primary, secondary, and potential transit program areas for the elderly and persons with disabilities. It also identifies the framework of a regional public transportation program that includes potential new corridors, public transit service providers, and potential new service provider. The strategy also keys in on strategic highway projects deemed necessary to support public transportation in Pinal County. Project/Program descriptions are provided along with the estimated cost of implementation. Two highway projects are identified for Maricopa: widen SR 347 from Maricopa to I-10 ($28 million), and SR 347 overpass at the UPRR tracks ($35 million). While the latter project is underway, this current TMP is furthering the examination of opportunities to widen SR 347 north to I-10 (refer to SR 347 Assessment in Appendix H). This strategy document also identifies Maricopa as a Local Mobility Project City and a location for the provision of Primary Transit Service. The Secondary Service Area of Maricopa for public transportation encompasses the Primary area, extending south to the extended alignment of Val Vista Road and north to Maricopa County.

REGIONAL TRANSPORTATION PLAN UPDATE, FINAL REPORT, SEPTEMBER 10, 2008

This plan was developed to guide planning and programming of roadway projects through the Year 2030. It defines a program of recommended roadway improvements and provides a staged, implementation guide to meet short-, mid-, and long-range needs. It also establishes a framework for adjusting land use and transportation facility policies to assure development of a Year 2030 roadway system that will serve projected growth. The Public Transportation section of the report presents an overview of the near-term and mid- to long-term local and regional public transit services, needs, and planned programs supported by the City. It concludes with a map of proposed Circulator routes.

I-8 AND I-10 HIDDEN VALLEY TRANSPORTATION FRAMEWORK STUDY, OCTOBER 2009

Following the encouragement of the ADOT Feasibility Study, the City joined in this multi-jurisdictional, regional study undertaken to provide a comprehensive transportation structure for providing future multimodal transportation needs in western Pinal County and southern Maricopa County. This study focused on the anticipated transportation requirements of a growing population in the central portion of the megapolitan Sun Corridor region. It specifically focused on definition of a framework of high-capacity roadway and transit improvements to accommodate regional mobility and connectivity, providing guidance to support preservation of rights-of-way in advance of certain growth. Participation by the City in this study aided in identifying potential future high-capacity, multimodal travel corridors, which are now the focus of actions to preserve needed rights-of-way and secure necessary funding at the regional, state, and federal levels.

PINAL COUNTY TRANSIT FEASIBILITY STUDY, APRIL 2011

This study conducted by Pinal County identifies four growth areas, where future transit service should be focused. It covers a broad range of transit options, outlining an integrated, multimodal transportation

system that includes potential commuter and local rail lines that complement the regional highway network and facilities for bicycle and pedestrian travel. The study addresses the next steps the County should take to develop the transit components of the proposed multimodal system. In this sense, the study sets forth a "roadmap" for the development of transit services improvements through the Year 2030.

MARICOPA CITY COUNCIL STRATEGIC PLAN, JANUARY 2013

This planning document addresses visionary, long-term solutions to problems challenging the City. It focuses on five priorities: 1) Economic Sustainability, 2) Quality of Life, 3) Transportation, 4) Public Safety, and 5) Quality Municipal Services. The City Council's vision for transportation is a safe and efficient transportation system that facilitates travel for people, goods, and services. Past achievements relative to public transportation include implementation of the COMET DR service. Immediate strategic objectives include:

- Working toward acquiring the necessary funding to advance recommendations in the *Hidden Valley Framework Study* (see discussion above);
- Enhancing the safety, mobility, and connectivity of the intra-city transportation system;
- Completion of the design and implementation of the Maricopa Transportation Center at the former Estrella (Gin) Property; and
- Creating regional transit partnerships, as appropriate, to foster expansion of available destinations and timeframes of service for City residents.

Future strategic objectives relating to transit include: improving connectivity and accessibility of the new Maricopa Transportation Center, completing the required siding for relocation of the Amtrak Station, and securing an alignment through Maricopa to provide Commuter Rail service to Phoenix and Tucson.

DESIGNING TRANSIT ACCESSIBLE COMMUNITIES (DTAC) STUDY, JUNE 2013

This study focused on the challenges faced by pedestrians and bicyclists during trips to access transit service and waiting at the stop. The resulting MAG report presents a regionally relevant "toolkit" based on Best Practices that provides guidance for achieving more transit accessibility in communities of the MAG region. Local and regional strategies are identified and defined to guide considerations associated with implementing multimodal improvements in transit catchment areas and discussions in the community regarding transit accessibility issues relative to existing and future services.

CITY OF MARICOPA 2040 VISION STRATEGIC PLAN, MAY 2015

This document reflects the outcome of a citizen-driven visioning program. It is intended to provide guidance for planning Maricopa's future for the next 25 years. The *City of Maricopa 2040 Vision Strategic Plan* defines areas of strategic importance to the community and focus, which are stated as Vision Elements:

- Well Planned Quality Growth and Development;
- Economic Development;
- Community Resources and Quality of Life Amenities;
- Safe and Livable Community;
- Community Pride, Spirit, and Relationships; and
- Fiscal Policies and Management.

The Vision Elements express what really is most important to the community and identify where critical resources should be committed. Specific goals, a rationale for, and strategies have been articulated to aid

in appropriately directing resources to achieve the overall vision for the City. Specific features of the *Maricopa 2040 Vision* applicable to public transportation have been highlighted above in Section 9.3, Goals.

SOUTHEAST VALLEY TRANSIT SYSTEM STUDY

The MAG/Valley Metro *Southeast Valley Transit System Study* being conducted during preparation of this TMP encompasses Apache Junction, Chandler, Florence, the Gila River Indian Community, Gilbert, Guadalupe, Maricopa, Mesa, Phoenix, Queen Creek, Tempe and the surrounding portions of Maricopa and Pinal Counties. The study will be providing short-, mid-, and long- term recommendations for advancing transit services throughout the defined study area. It will include:

- A review of existing services;
- Analysis of current and future travel demands to determine where there might be unmet needs;
- Planning for future population growth and economic development; and
- Community input.

This study also is directed toward identifying an integrated, performance-based, demand-driven, transit system that will provide effective and efficient connections between and among the communities in the Southeast Valley study area. Additionally, the establishment and connectivity of existing and planned regional transit improvements are to be examined, especially potential opportunities for high-capacity transit service, such as regional bus route connections, BRT, METRO LRT extensions, and Commuter Rail. Key objectives associated with this study are, in addition to determining the appropriate timing of future improvements (i.e., short-, mid-, and long-term):

- Identify efficiencies and service gaps for existing and future transit services –
    - Optimize existing services
    - Identify current and potential future unmet needs
    - Address changing study area conditions; and
- Investigate funding strategies and partnership opportunities.

At the time of publication of the TMP, the *Southeast Valley Transit System Study* was still ongoing, and recommendations had not yet been finalized. However, recommendations pertaining to the City of Maricopa were general enough that they could be incorporated into this TMP. These recommendations are further described in Section 9.6 of this TMP.

Additionally, as part of the *Southeast Valley Transit System Study*, a survey of Southeast Valley residents was conducted and the results for the City of Maricopa were shared with the project team for inclusion in this plan. The key questions from the survey were:

- Do you work in the same city/town/community that you live in?
- Do the public transportation options in your community meet your needs?
- Which city/town/community do you work?
- Why don't the public transportation options in your community meet your needs? (choose all that apply)
- Would you support a fare increase (or pre-paid bus pass) in order to fund transit improvements in your community?

- Would you support a tax increase in order to fund transit improvements in your community?
- What, if anything, would encourage you to use public transit?

Results from each of these questions are summarized below in Figure 9-1. The results of the survey indicate the majority of City of Maricopa residents travel outside of the City limits for work. A large share of commuters work north of the city; Phoenix, Chandler, Mesa, Tempe, and Gilbert occupy five of the top six work commute destinations. Also, the City of Florence, located east of the city, was revealed as another top work commute destination.

Figure 9-1 | Summarized Maricopa Results of Select Survey Questions, Southeast Valley Transit System Study

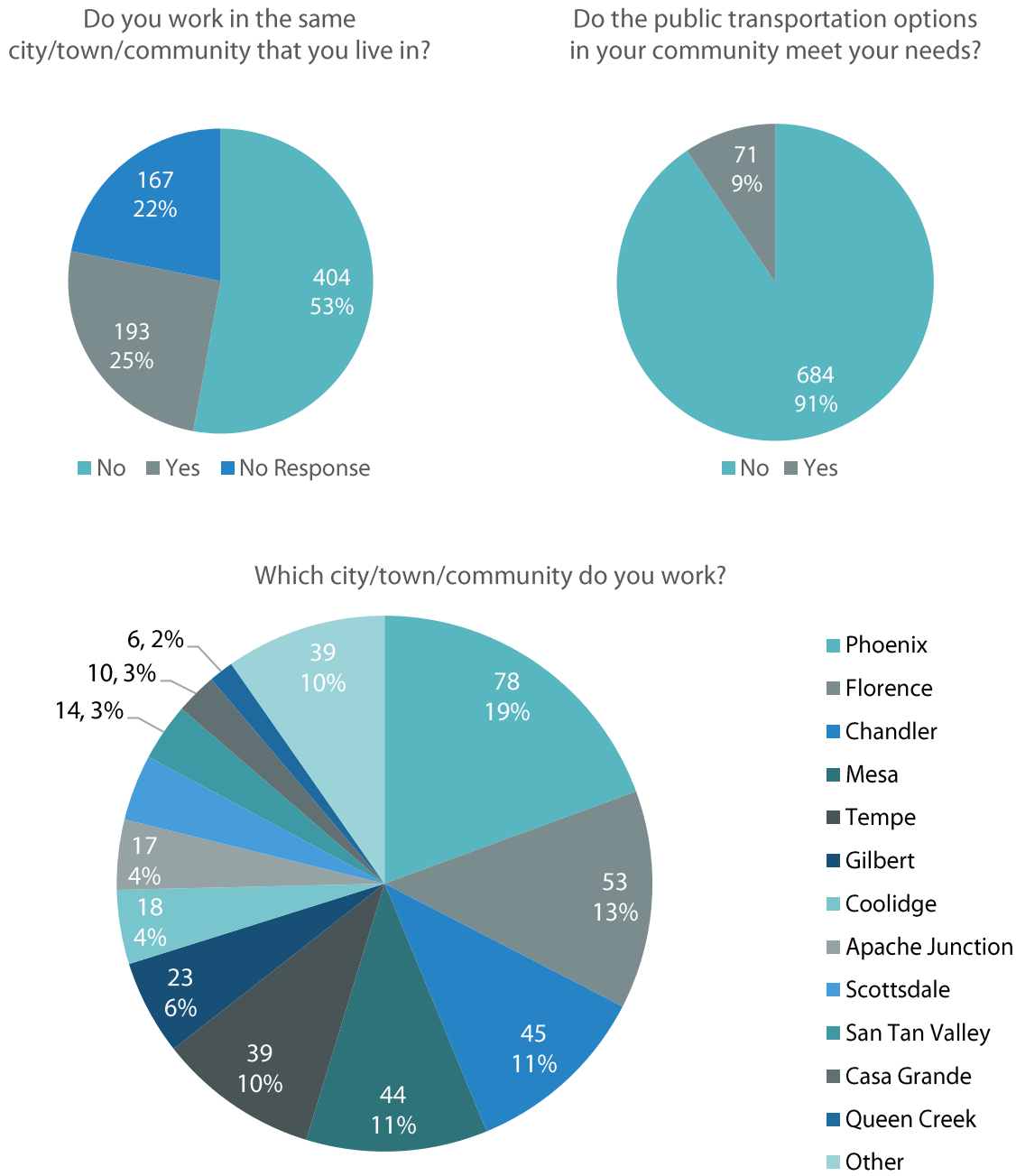
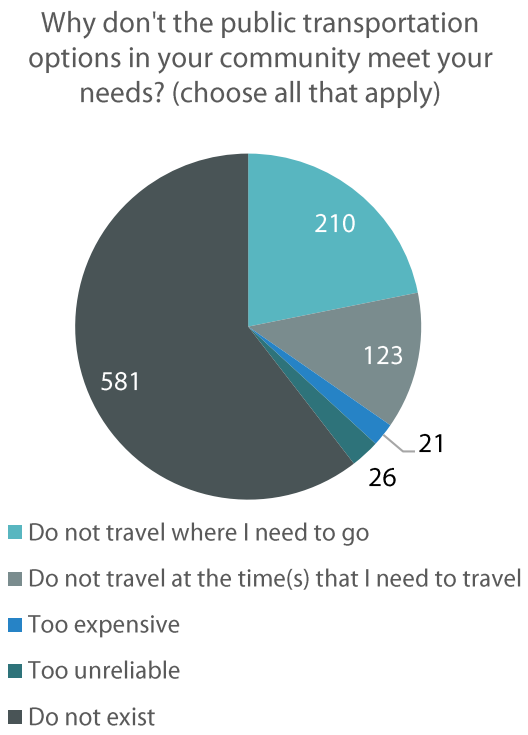
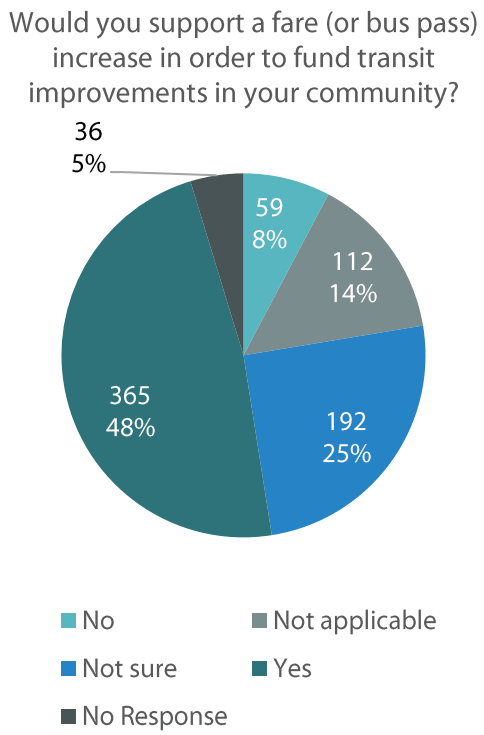
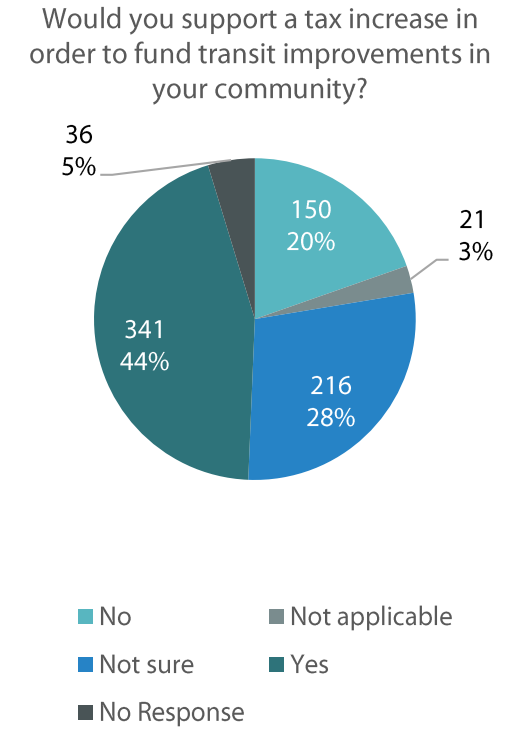
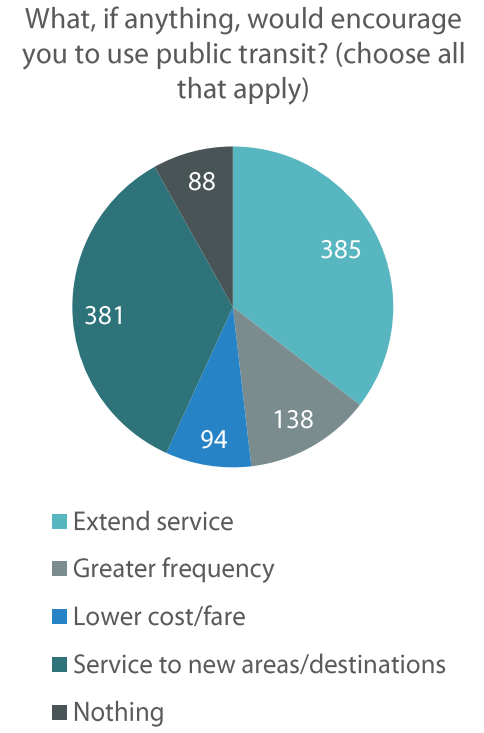


Figure 9-1 | Summarized Maricopa Results of Select Survey Questions, Southeast Valley Transit System Study (Continued)









It also was clear from the survey that public transportation options were not meeting the needs of City of Maricopa residents. An overwhelming 91% of survey respondents felt public transportation options were lacking. The most common responses for why the public transportation options were lacking: transit options do not exist, buses do not travel where residents need to go, and buses do not travel at times residents need to travel.

Survey respondents also were asked if they would support various initiatives to fund expanded transit service. When asked if they would support a fare increase, 48% of respondents said they would and 25% were undecided. The responses were similar for a proposed tax increase, with 44% in support of taxes for transit service and 28% undecided.

Finally, respondents were asked what changes to the transit service would encourage them to use it. The majority of responses cited extended service hours and expand service area to new destinations.

9.5 REGIONAL TRANSIT SERVICES & FACILITIES

A discussion of existing transit services and facilities in the Study Area was presented in Section 5.2, Existing Transit Services. This section discusses issues relating to further development of Maricopa's transit services relative to future potential markets and connectivity with adjacent communities. Particular emphasis has been given to MAG's transit development program for the Phoenix metropolitan area and services provided by Central Arizona Regional Transit System (CART), the primary public transit service for Casa Grande, Coolidge, and Florence.

CURRENT SERVICE LIMITATIONS

The current COMET DR service has the specialized focus of providing mobility and accessibility opportunities for persons with particular limitation on travel (e.g., elderly, disability, lack of an automobile). Although this is a primary service that is essential to the social well-being of the City overall, it is not an efficient system for moving large number of persons between and among various community destinations. It is not the type of system that will accommodate peak-hour commuter travel internal to the City or to external destinations, such as the Phoenix metropolitan area.

The smaller, 21-passenger vehicles do not have the capacity for peak-hour commute travel and the limited scheduling, as well as the need to pre-schedule, is not responsive to time-sensitive, work-related travel. Because there are a low number of passengers per scheduled operations, the operating cost of the service is correspondingly very high. Notwithstanding the drawbacks of DR service, COMET Fixed-Route service has the potential to adequately serve target populations, such as: college students attending the new Central Arizona College – Maricopa Campus; persons who need a connection with CART service in Casa Grande for travel to other Central Arizona College campuses; and the elderly and low-income population, who need the service for site-specific travel (e.g., medical appointments). In addition, the new Copper Sky Recreation Center could create a demand for more service. Recent time extensions for COMET service, the acquisition of additional minivans, the addition of the Limited Fixed-Route service (with route deviations), and completion of the Maricopa Transportation Center are expected to contribute to continued growth of the City's transit system.

VALLEY METRO TRANSIT SYSTEM

Valley Metro is the regional transit system serving Maricopa County and the MAG region. According to its *Fiscal Year 2014 System Fact Sheet*, Valley Metro recorded over 70 million boardings on its multimodal system. Included in the Valley Metro system are:

- 20 miles of LRT service (with seven extensions planned, bringing the total to 60 miles by 2034);
- 58 local bus routes;
- 15 Express and 5 RAPID (BRT) bus routes;
- 2 LINK bus routes;
- 18 Circulators;
- 1 rural route;
- 8 Dial-a-Ride systems;
- Vanpool service; and
- Online carpool and vanpool matching system

Currently, none of the existing bus and rail routes operated by Valley Metro serve the City of Maricopa. However, the ongoing *Southeast Valley Transit System Study* is examining alternatives for connecting the City of Maricopa to Valley Metro's regional system in the most effective manner.

PINAL COUNTY CENTRAL ARIZONA REGIONAL TRANSIT SYSTEM (CART)

The CART is a regional bus system jointly funded by ADOT, Central Arizona College, City of Coolidge, Pinal County, and Town of Florence. CART provides fixed-route service Monday through Friday with connections in Florence, Coolidge, Central Arizona College, and Casa Grande. CART is the initial step in creating a regional transit system to serve Pinal County. The exhaustive *Pinal County Transit Feasibility Study* set the stage for initiating this regional transit service, and it serves as the basis for expansion in the future to provide connectivity through the county and with adjacent Maricopa County.

Major travel flows for all trip purposes and for work trips were examined during the *Pinal County Transit Feasibility Study* to establish existing travel patterns and forecast future travel patterns. Future land use and demographic data were analyzed to create a forecast of expected future travel demand and the implications for a future transit system. Potential future transit demand was examined in light of various transit system options, e.g., Commuter Rail, LRT, BRT, Express Bus, Regional Bus, as well as service options, such as Flex Service and Vanpools.

The analysis revealed four short-term markets for transit service, based on current demographic and development patterns. These markets, the study noted, could be served with short-term improvements of transit service in the county. The four current transit service markets reflect existing dominant travel patterns identified through analysis of travel demand:

- Apache Junction, Maricopa, and Case Grande to Maricopa County;
- Maricopa to Apache Junction;
- Eloy, Maricopa, and Coolidge to Casa Grande; and
- Florence to Coolidge.

The study provided definition for a comprehensive transit system composed of routes and facilities that ultimately would accommodate a variety of transit services. The key component of this system relevant to the transit needs of Maricopa are summarized below with some updates to reflect additional information and amplification of the role provided by the service or facility.

- **Transit Centers:** Central facilities at key locations around which multiple levels of transit service (e.g., BRT, Regional Bus, Local Bus, Circulators, Park-and-Ride) could be focused.
- **Express Service:** Limited-stop service (as described earlier) from Maricopa, Casa Grande, San Tan Valley, and Apache Junction to Downtown Phoenix, ASU, Scottsdale Airpark, and other major activity and employment centers via HOV lanes and connections to METRO LRT.
- **Park-and-Ride Lots:** Facilities directly accessible to Express Bus, BRT, or rail transit routes for longer trips; lots also could serve as staging areas for vanpools and carpools.
- **Regional Bus Routes:** Fixed-route service connecting: Florence and Casa Grande via Coolidge and Central Arizona College (the current CART route); Maricopa and Casa Grande; and Arizona City and Casa Grande via Eloy and Toltec (part-time service).
- **Vanpool/Carpool:** Expanded County- and Valley Metro-based programs to reduce travel associated with SOVs.
- **Volunteer Driver:** A countywide program designed to provide needed public transportation services in areas not otherwise served.

The study concludes Maricopa will continue to grow, and travel will continue to be highly oriented toward destinations in the Phoenix metropolitan area, but also higher levels of travel will be manifest between Maricopa and Casa Grande. Transit services and facilities added in the Year 2025 would complement the short-term improvements cited above or replace and upgrade existing services and facilities to reflect increasing travel demand, e.g., replace a Park-and-Ride Lot with a Transit Center.

The study envisions a Maricopa Transportation Center that ultimately would be a focal point for regional transit services offered in Pinal County (specifically between Maricopa and Casa Grande) and Express Bus connections with destinations in the Phoenix metropolitan area. The City already is in the planning stages of the Maricopa Transportation Center to be developed in conjunction with relocation of the Amtrak Station one mile west of its present location at SR 347. MAG's *Commuter Rail Strategic Plan*, referenced in *Pinal County Transit Feasibility Stud*y, identifies the SR 347 as a possible rail extension corridor, connecting a future Tempe Branch with the Amtrak, which operates on the UPRR Sunset Line. Commuter Rail service is in the very early stages of conceptualization and planning; therefore, the Express Bus, or potentially BRT, service in the SR 347 would be an appropriate interim solution for commuter travel.

As an expansion element of transit service in Pinal County, the *Pinal County Transit Feasibility Study* recommends three Regional Bus routes that would connect at the future Maricopa Transportation Center:

- **Maricopa – Casa Grande:** This Regional Bus route initially implemented to operate between Maricopa and Casa Grande (as identified above), would be extended to the community of Heaton on SR 238 west of Maricopa, as it becomes developed. This route would operate through the Maricopa Transportation Center to the Casa Grande Transit Center along MCGH. The City already

has a connection between SR 238 and SR 347 via Garvey Avenue under consideration, which would aid in providing transit service to Heaton through the Maricopa Transportation Center.

- **Maricopa – Casa Grande via Peters Corner:** This route would serve new activity centers in Hidden Valley and provide connections at the Maricopa Transportation Center for Hidden Valley residents with Phoenix Express Bus service and other Regional Bus routes. The route would follow SR 347 and SR 84 with Park-and-Ride Lots at Stanfield and Peters Corner between the Casa Grande and Maricopa.
- **Maricopa – Gila River:** This route would operate between Maricopa and developments along the Gila River Indian Community's Wild Horse Pass Boulevard. The route would operate primarily serving work trips via SR 347.

9.6 POLICY CONSIDERATIONS

With membership of MAG, the City of Maricopa enjoys the advantages of regional transit service planning and implementation. The *Southeast Valley Transit System Study* jointly conducted by Valley Metro and MAG involved evaluation of existing transit services and facilities as well as potential travel demand for an area encompassing Maricopa. The study has been focused on identifying short-, mid-, and long-term transit needs and developing recommendations to meet those needs. The objective of the study is to advance development of the transit services throughout the MAG region, which includes linkages with the City of Maricopa.

DEVELOPING A TRANSIT-READY COMMUNITY

WHAT IS A TRANSIT-READY COMMUNITY

A "transit-ready" community integrates transit services throughout the community by (1) evaluating development densities compatible with efficient transit operations, (2) adopting street designs suitable for transit operations, and (3) establishing connectivity of transit system elements with primary travel corridors. A key element in the creation of a transit-ready community is adoption of TOD guidelines. TOD guidelines encourage uses and densities along transit corridors, especially adjacent stops/stations that support transit ridership. Such guidelines also ensure effective pedestrian connections to transit stops/stations and may provide incentives to developers for higher density developments that place potential riders in close proximity to transit services.

Other policy guidance provided to support creation of a transit-ready community may focus on street design and parking, based on guidance associated with the Complete Streets concept discussed earlier. The provision of shelters and other amenities along transit corridors and with respect to neighborhood transit routes also supports transit ridership and aids in integrating the transit system and service into the community way of life (refer to the MAG DTAC Study above). In this sense, a transit-ready community seeks also to improve quality of life by making transit use a norm for travel decisions, rather than an object of last resort. Specific attention is given to accommodating the potential transit rider in a transit-ready community. The primary focus is on the pedestrian – all trips begin and end as a pedestrian, which leads to continuous sidewalks, accessibility for physically challenged persons, and narrowing of streets where pedestrians need to cross.

The TOD guidelines are oriented to supporting the full integration of community activities with the transportation experience. Therefore, a transit-ready community seeks to create a mix of retail, office, restaurants, residential, and other uses integrated with multiple modal options. Transit services are an

essential element of the mix of transportation options, not an afterthought. Automobile travel still is accommodated, but priorities are adjusted to permit the inclusion of transit services, as well as pedestrian and bicycle travel, in the transportation infrastructure, as espoused by the Complete Streets concept. By creating favorable proximity with transit services, "choice riders" are more likely to select the transit option. This reduces automobile travel and stimulates, again, a different norm for travel decisions.

A transit-ready development pattern has the potential of providing residents and visitors alike with viable alternatives for travel and, ultimately residential choices. Close proximity to transit has the potential to create opportunities for cost-savings and convenience for everyone in the community. Thus, seeking to create a transit-ready community represents a fundamental quality of life improvement program that will benefit a broader range of the population and economic resources represented in the community.

ESTABLISHING THE TRANSIT-READY COMMUNITY

Bus Stop Prototypes developed by MAG within the framework of the DTAC Study cited earlier provide general guidance for bus stop development and configurations. Five Bus Stop Prototypes are defined: Urban Core, Urban Retail, Urban Residential, Suburban Retail, and Suburban Residential. The latter two prototypes are most applicable to the current and near-term future transit services of the City of Maricopa. Each of these prototypes is defined by 13 bus stop attributes or characteristics. As a policy consideration, summaries of the two applicable prototypes excerpted from the DTAC Study report would provide Maricopa with the appropriate initial planning and decision framework for establishing and designing accessible transit stops within the community.

- **Suburban Retail:** A Suburban Retail bus stop area has retail land use present and low population and employment density; however, there are no high frequency transit routes serving these locations. Surrounding these bus stop types is a conventional street network with nearby large shopping centers and big box stores with large parking areas. The stops are dispersed throughout the MAG region in relation to the presence of retail and commercial activity, with no particular geographic concentration.
- **Suburban Residential:** A Suburban Residential bus stop has no retail land use present. These stops typically are only serviced by limited-stop, Express Bus service, or no local service at all. The surrounding area has low population and employment density. This category generally is the most common type of bus stop. The surrounding area includes a conventional street network with residential subdivisions and master planned communities, many of which are gated or walled. The Suburban Residential bus stops typically are dispersed throughout the MAG region and have no geographic concentration.

Transit service development policy based on these definitions of bus stop types is complemented in the MAG study by a "Toolkit" that presents pedestrian and bicycle improvement recommendations. If implemented, the recommendations can support positive change in processes employed to coordinate and integrate roadway and land use environments with access at bus stops. The Toolkit includes guidance relating to 11 improvement measures identified to aid communities in addressing common transit system access issues based on Best Practices nationally and sensitivity to issues characteristic of the hot, arid climate of the MAG region. The following guidance has been excerpted from the DTAC Final Report with some modifications for brevity and relevancy to the City of Maricopa; the report should be referenced for more detailed information.

Lighting Street and pedestrian lighting are important features at bus stops and nearby crossing locations. The safety and comfort of adequate lighting promotes safety and security for pedestrians and transit users and increases the quality of life of a community by extending the hours in which pedestrian and bicycle travel can safely take place along a street.

Information Signage An effective transit system operation provides riders with easy, reliable, and up-to-date information regarding available services. Bus service information at bus stops, including times, destinations, and any special instructions (e.g., no open containers, availability of wheel chair access) is important to transit users and can be used effectively to increase ridership by retaining existing riders and encouraging the use of transit by new riders, infrequent riders, and disabled individuals.

Wayfinding Wayfinding is an important component of an effective transit system, as it guides transit users to stops and aids in creating a system image of continuity and community within the community. Wayfinding includes physical (e.g., paths, landmarks, nodes, edges, districts) and visual (e.g., signs, maps) elements that orient people to the presence and availability of the transit system and services offered.

Seating Seating typically is associated with shelter design at transit stops; however, seating may be provided independent of bus shelters. For example, a bench with a shade tree can provide comfort and convenience at bus stops. Seating is based on the needs of existing and expected future ridership at a stop. Seating also may be incorporated into the design of developments adjacent to transit stops. For example, street walls along the property line could be constructed at a height that allows passengers to use the wall as seating. This is a good solution that also can include shade from landscaping and aids in integrating the transit stop with community activities.

Shelter Shelters provide seating, protection from the elements – specifically the sun, and serve as a visual guide for transit stops. Within the MAG region, local jurisdictions determine bus shelter designs and placement. There are a variety of designs that can accommodate different passenger volumes, as well as various site demands. Shelter placement should be evaluated with respect to orientation (south facing, north facing, etc.), time of day, and transit service times to optimize protective value. Because the cost of shelters is high compared to a simple bench, the decision to install shelters depends on a number of factors, including number of passengers served at the stop, available space, presence and use by physically challenged users, and compatibility of adjacent land uses.

Landscape Shading Adequate shading can improve uncomfortable environmental conditions created by the sun in Arizona. As noted above, a key function of shelters is to provide protection from environmental conditions. However, some locations and circumstances may justify consideration of other shading strategies, such as locating the bus stop near an existing tree or proximate to a nearby building that would provide shade during times of peak activity at the stop.

Adjacent Land Use An important element to consider, when creating or improving access and environmental conditions relating to a transit stop, is the adjacent land use. Transit stops adjacent to certain land uses, such as retail stores and services, can be compatible with high levels of pedestrian activity and provide services that may be useful to transit users. Proximity to stores and services also creates an opportunity to obtain an economic development return from the community's transit investment. In contrast, adjacent developments with large setbacks, retaining walls,

or gated communities can be intimidating and act as barriers for pedestrians and bicyclists seeking to access transit services.

Bicycle Access Bicycle access to transit services improves mobility, extends and enhances transit service quality, and reduces reliance on automobiles. Some of the common challenges to providing good bicycle access include: street crossings, lack of bicycle lanes or paths, perceived danger of roadways, constrained right-of-way, station or stop characteristics, connectivity of travel, transit agency policies, and surrounding land uses. Bicycle access, however, must be considered in concert with accommodations for the bicycle, which requires transit operators to address bicycle parking and/or bicycle racks on transit vehicles.

Bicycle Parking Bicycle accommodations address the need for bicycle parking and on-board stowage of bicycles (exterior and interior). Providing bicycle accommodations at transit stops can greatly expand the service area of a transit system, as bicyclists can and will travel greater distances to gain transit access than pedestrians.

Pedestrian Crossing Pedestrians, as well as bicyclists, are particularly vulnerable at roadway crossings, i.e., crosswalks, which makes this potential improvement measure especially important. Typically, roadway crossings are located at street intersections or at mid-block locations. When evaluating means for accommodating safe access to transit stops, particular attention must be given to locations where a high frequency of vehicle-pedestrian conflicts have been reported. The MAG study found that 50 percent of current users surveyed would increase their use of available transit service, if curb extensions, which would decrease the distance and exposure of pedestrians to roadway traffic, were added to the roadway. Also, 43 percent of current users indicated the installation of medians in wider roadways would encourage them to increase their use of transit services.

Sidewalk Sidewalks provide the primary route of travel for pedestrians desiring to access transit stops. Creating a safe and comfortable pedestrian environment, therefore, is important to a transit system's success. Unsafe and unfriendly pedestrian environments, such as narrow or damaged sidewalks, poor landscaping, poor lighting, lack of ramps, deter walking activity. Widening and detaching sidewalks from traffic operations provides a buffer, which improves real and perceived pedestrian safety. Additionally, wide sidewalks with "buffer zones" make additional pedestrian improvements possible (e.g., landscaping and shade) to create a more comfortable walking environment.

In addition to the Toolkit, the DTAC Study resulted in an Implementation Checklist. The Implementation Checklist identifies a number of considerations to address when planning the placement, replacement, or upgrade of transit stops in the community. It was developed to aid MAG members in the design, development, installation, and maintenance of transit stops. The checklist includes core elements associated with safe and secure access to transit stops revealed throughout the study and focuses on specific actions to be considered relative to the 11 improvement measures summarized above.

REGIONAL COORDINATION OF TRANSIT SERVICES

EXPRESS BUS SERVICE

Regional transit service expansions and extensions leading to connectivity of the City with the Phoenix metropolitan area would be coordinated through Valley Metro. Valley Metro is the operating entity of Valley Metro Regional Planning Transportation Authority (RPTA). Valley Metro provides transit service for multiple

communities in the MAG region. Demographic projections for Years 2030 and 2040 would be relied on as recommended service improvements are contemplated and planned. Actions to implement recommendations cited above would be processed through the planning and programming framework established by MAG for transit services.

Express Bus service, in particular, would be included in future planning. Service from the City of Maricopa to Sky Harbor International Airport, Downtown Phoenix, Downtown Tempe/ASU Main Campus, and other locations would be studied in the regional context to determine travel demand and funding priorities. Regional transit planning also would focus on connectivity of the City with Central Arizona communities in Pinal County, such as Casa Grande, Eloy, Coolidge, and Florence. A central hub is anticipated to be located in Casa Grande.

PARK-AND-RIDE SITES

Park-and-Ride sites are important to the success of Express Bus service. The existing Maricopa Park-and-Ride Lot, located on the eastern side of the intersection of Garvey Avenue with SR 347/John Wayne Parkway. The lot is used to support vanpool services sponsored by Valley Metro. Recent studies to grade separate SR 347 at the UPRR tracks have resulted in numerous options for aligning SR 347 and its intersections with Honeycutt Road and MCGH. The preferred alignment configuration would require taking the property upon which the Maricopa Park-and-Ride Lot is located. However, the City is in the process of creating the Maricopa Transportation Center on the north side of Garvey Avenue approximately one mile west of SR 347 in conjunction with relocation of the Amtrak Station, as noted earlier. The Maricopa Transportation Center would include facilities to accommodate transit transfers, Park-and-Ride transit patrons, as well as vanpool services.

9.7 CITY OF MARICOPA TRANSIT PLAN

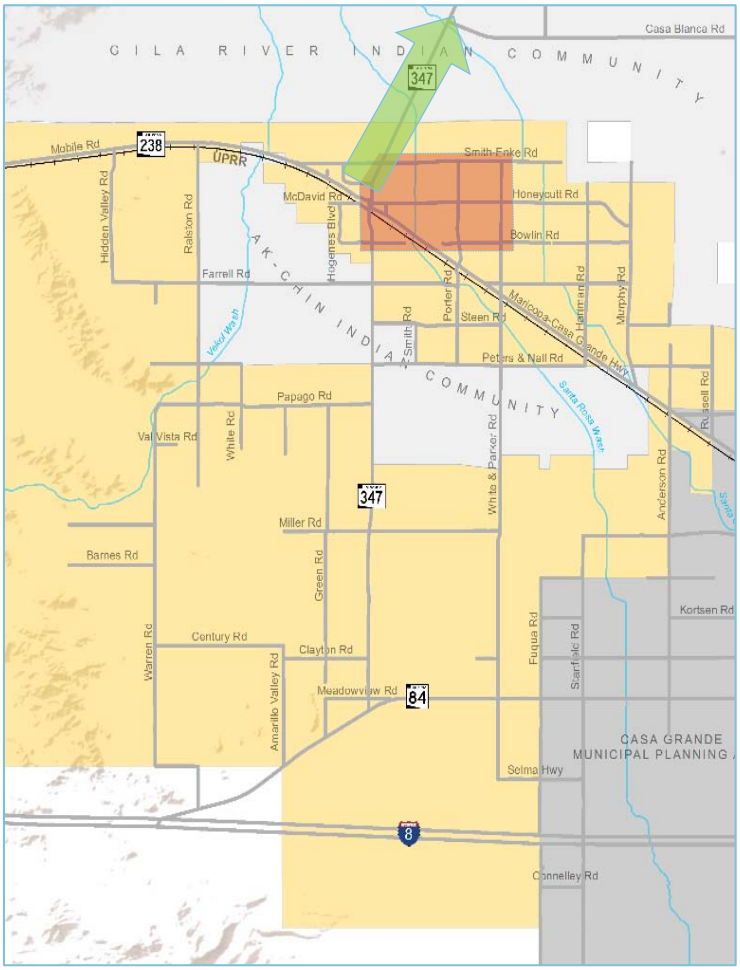
In lieu of a formal transit plan, which has not yet been prepared for the City, the findings and recommendations of the *Pinal County Transit Feasibility Study* (April 2011) and the *Southeast Valley Transit System Study* (May 2015) provide reasonable guidance for future transit services. The more recent *Southeast Valley Transit System Study* incorporates information from the former study and sets forth recommendations for Optimization of Existing Services. In addition, the City has established a short-term framework of actions for improving transit services in the next five years. Beyond that the *Southeast Valley Transit System Study* has resulted in recommendations for the Mid-Term Planning Horizon to be implemented within 10 years and Long-Term Planning Horizon slated for implementation beyond 10 years.

SHORT-TERM TRANSIT SERVICE IMPROVEMENT RECOMMENDATIONS

In the next five years, the City focus for operational improvements should be placed on enhancing existing COMET service to include DR service, shuttle service, and limited fixed-route service. The City also should continue to support Valley Metro vanpool services to and from the Phoenix metropolitan area. These priorities are depicted in

Figure 9-2. The red shaded area shows the focus area for enhancing COMET service, and the green arrow marks the connection to the Phoenix metropolitan area supported by vanpool services.

Figure 9-2 | Recommended Short-Term Transit Improvements



Besides the operational changes noted above and discussed in Section 9.5, other changes have been recommended that would make the service more user friendly and potentially attract more riders:

- Rider Palm Cards for easy reference about the service;
- Posting of the Route Map in all vehicles;
- Punch Cards or Ride Coupon Booklets;
- Reconfiguration of the fixed-route service to include activity centers, such as The Copa Center;
- Bicycle racks on COMET vehicles; and
- Improved signage at all stops.

There also is continuing planning to identify potential actions that will improve and expand the availability of transit service in the community.

The Maricopa Transportation Center is a project that is moving toward implementation. This multimodal facility also will be integrated with a relocated Amtrak Station, as noted earlier. Additional actions are aimed at establishing a more comprehensive transit system within the City and relative to connections to destinations outside the City, specifically:

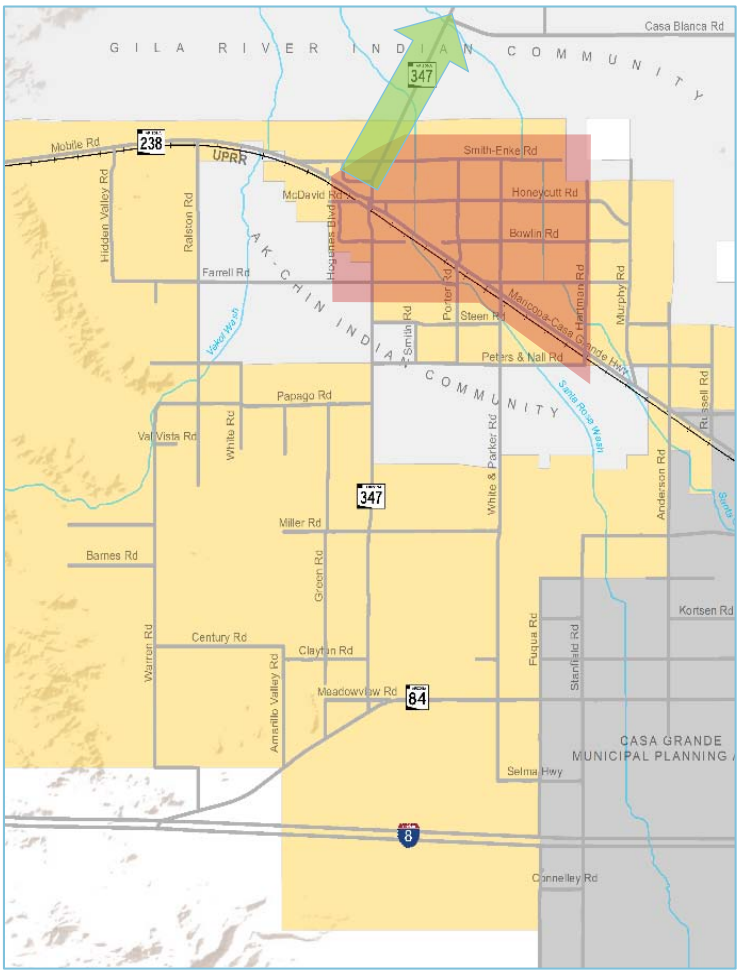
- Planning has been initiated to design and locate bus shelters, where such facilities are warranted. Reference should be made to the following guidance during this planning activity –
  - *Bus Stop Design Guidelines,* RPTA Bus Stop Program and Standards, Regional Public Transportation Authority/Valley Metro, November 2007;
  - *Guidelines for the Location and Design of Bus Stops*, TCRP Report #19, Transit Cooperative Research Program (TCRP) sponsored by Federal Transit Administration (FTA);
  - *Designing Transit Accessible Communities*, Maricopa Association of Governments (MAG), June 2013; and
  - *Complete Streets Guide*, MAG, December 2010.
- Planning has been initiated to identify and secure appropriate regional connections with destinations in the Phoenix metropolitan area and central Pinal County.
- Special transit service connections are being investigated for the Heritage District.

- Maricopa is an active partner in development of the aforementioned MAG/Valley Metro *Southeast Valley Transit System Study*.

MID-TERM PLANNING HORIZON RECOMMENDATIONS

Mid-term recommendations anticipate expanding or filling in the existing transit service network gaps within the City of Maricopa within the next 15 years (pre-2030). The recommended mid-term actions principally focus on the expansion of the transit network to serve potential growth areas located on the fringe of the existing transit network. Mid-term transit priorities are shown in **Error! Reference source not found.**.

Figure 9-3 | Recommended Mid-Term Transit Improvements



Recommended actions for the mid-term also include the implementation of express bus service to meet growing commuter travel, particularly between the City and the Phoenix metropolitan area. Express Bus service provides fast, limited-stop connections over longer distances, picking up at select locations near the beginning of the route and dropping off passengers at select locations near the end of the route. Thus, Express Bus service generally focuses on serving Park-and-Ride facilities and connections with major, i.e., high volume, fixed-route transit service.

The hourly cost of providing Express Bus service generally is greater than the hourly cost of providing local service. Industry Best Practices indicate service levels at or above 30 passengers per trip are most cost-effective. Therefore, the cost of this specialized service to transit patrons can be substantial, but the trip is expedited, often in vehicles outfitted with various amenities not available on local buses, such as electrical power, WiFi, and bathrooms.

The area marked in red depicts the locations where local fixed-route service should be expanded and daily service should be implemented. The green arrow denotes where express route services connecting to the Valley Metro transit system should be implemented.

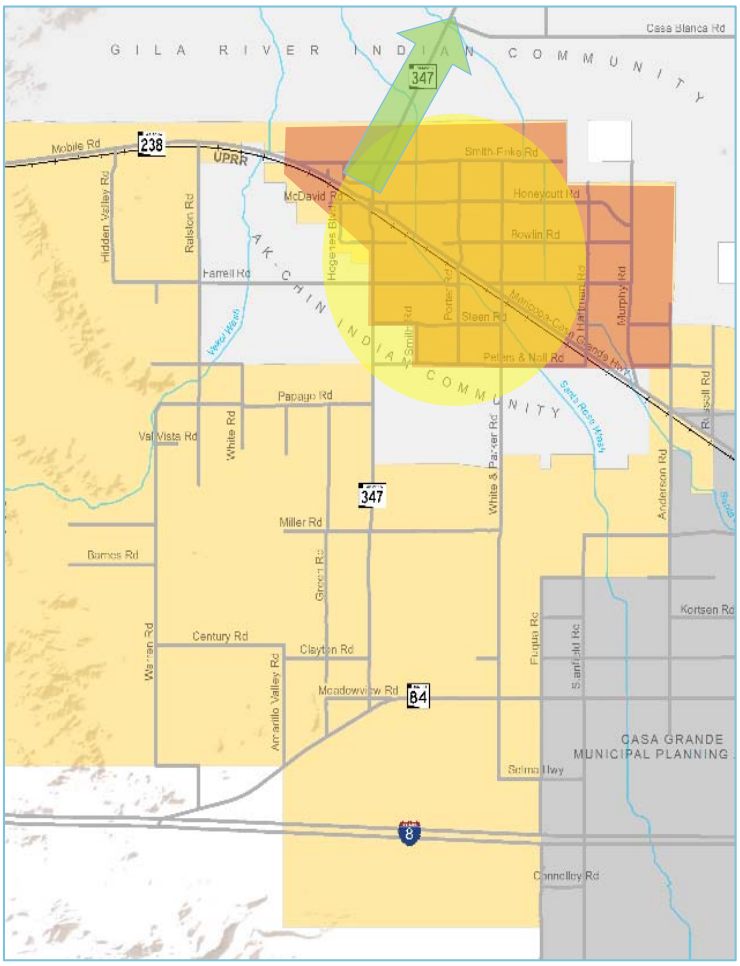
Implementation of these recommendations for transit service improvements would occur through the regional planning and programming process coordinated by MAG, which is based on evolving priorities and available funding.

LONG-TERM PLANNING HORIZON RECOMMENDATIONS

Long-term transit goals for the City of Maricopa focus on improving connections within the City and providing improved connection to the Phoenix metropolitan area. The implementation strategies for achieving these goals are threefold: (1) continue to expand local fixed-route service in the City of Maricopa, (2) increase express bus service to the Phoenix metropolitan area, and (3) implement supplemental circulator service connecting to the Park-and-Ride Lot and Transit Center in order to further support the expanded express bus service.

Figure 9-4 depicts these recommended long-term transit priorities. The areas marked in red depict where local fixed routes bus service should be expanded, and the areas shaded in yellow denote the recommended location of the supplemental circulator service. The expanded express route service to the Phoenix metropolitan area is marked by the green arrow.

Figure 9-4 | Recommended Long-Term Transit Improvements



Implementation of these recommendations for transit service improvements would occur through the regional planning and programming process coordinated by MAG, which is based on evolving priorities and available funding.

COST EXPECTATIONS

Capital costs for system development and operating and maintenance (O&M) costs have been estimated as part of the *Southeast Valley Transit System Study*. These costs should be applied when evaluating potential transit system improvements.

CAPITAL COSTS

Capital costs are based on typical life cycles of vehicles associated with operating speeds and frequency for the different service types: Circulator, Local Bus, and Express Bus. A 20 percent spare allowance has been assumed for all vehicle types.

Assumed nominal capital costs (in current dollars) of typical vehicles are listed by type below:

- Standard Transit Bus (40 foot, alternative fuel) - $600,000
- Express Bus (40 foot, alternative fuel) - $600,000+, depending on amenities
- Circulator - $160,000
- Demand Response (cutaway) - $80,000.

A cost of $100,000 is added to each Standard and Express bus as a contribution to maintenance and storage facility requirements. A bus service life of 12 years has been assumed for the Standard and Express buses to account for ongoing vehicle replacement. A bus service life of seven years has been assumed for Circulator and Demand Response buses.

OPERATING AND MAINTENANCE EXPENSES

O&M expenses are based on revenue miles of service accumulated by service type, i.e., the cost is spread over the miles traveled by the vehicles while in revenue service. The O&M expenses associated with Flexible or Demand Response services are based on vehicle hours in service. The following nominal costs for each vehicle/service type have been established for estimating transit system O&M expenses:

- Express Bus service - $6.50 per revenue mile
- Local Bus arterial transit service - $6.30 per revenue mile
- Circulator Bus service - $5.70 per revenue mile
- Flexible/Demand Response service - $65 per vehicle hour with one vehicle per designated coverage zone
- ADA services 12% of fixed-route O&M expense; only for fixed-route services that increase ADA service area with route deviations.

10.0 INTELLINENT TRANSPORTATION SYSTEMS (ITS) PLANNING

ITS refers to various technologies and management strategies designed to foster safer and more efficient use of transportation networks. ITS utilizes remote sensing technologies (e.g., traffic count equipment, cameras, etc.), computerized databases, and real-time communication applications to monitor the operational status of transportation systems. Real-time information may be used to manage traffic flow, provide alternate route information, and reduce congestion and delay. ITS applications and strategies can improve the interaction of various modes of transportation and provide connectivity to emergency response and municipal facilities.

Effective implementation of ITS would enable transportation system users to make safer, more coordinated, and 'smarter' use of the roadway network. ITS deployment would give the City the capability to monitor and optimize traffic flow on arterial streets by:

- Coordinating traffic signal timing plans to allow for progression along corridors;
- Providing real-time verification of traffic intersection operations via a closed-circuit television (CCTV) camera feedback to a Traffic Management Center (TMC);
- Adapting signal timing to changing conditions through the central traffic signal system;
- Detecting traffic incidents;
- Alerting motorists of recurring or incident-caused congestion; and
- Improving incident response by police and emergency management personnel by providing real time CCTV viewing and travel time information; and
- Providing a fiber optic network (i.e., ITS “backbone”) that can be utilized by other City Departments to enhance services to the residents of the City of Maricopa.

The ultimate goal associated with developing ITS capabilities is improving traffic flow by reducing corridor and arterial traffic congestion.

This chapter lays the foundation for developing the City of Maricopa’s ITS network and defines short-term (2016 – 2020), mid-term (2020 – 2030) and long-term (2030 – 2040) ITS needs for the City. It provides a guide for the City of Maricopa to follow in order to implement the foundation of a comprehensive traffic management system that benefits from advancements in equipment and technology and addresses future needs. This chapter establishes the need for ITS investment and outlines opportunities for implementing a system of ITS projects based on known needs.

As development patterns change in the future, the focus on ITS deployment may shift to other areas of development that are perceived as higher priority. As development priorities change, communications deployment locations and strategies may also change, and there may be corresponding changes in CCTV deployment and traffic signal controller interconnection based on new fiber backbone routes and priorities that may be identified in the future.

10.1 ITS ARCHITECTURE

MAG recognizes the importance of the National ITS Architecture by adhering to its parameters during the development of the MAG Regional ITS Architecture Final Report, June 2010. An architecture website has been developed to show the inventory, interconnects, and customized market packages by stakeholder agency. The website is accessible at the address: www.consystec.com/mag/web, and also through a link from the MAG ITS Committee webpage.

Stakeholders are able to view the customized market packages specific to their agency and comment directly to the architecture developers. Agencies can also see what other market packages have been identified for other agencies as well to illustrate regional ITS integration. This provides a beneficial tool in reviewing the complete ITS architecture that has been developed for this region.

ITS projects developed according to this chapter may qualify for federal funding. An application for funding would require a Systems Engineering Analysis and compliance with the MAG Regional Architecture. ITS projects developed by the City of Maricopa should, therefore, demonstrate compliance with the regional architecture, as described above.

10.2 INVENTORY OF EXISTING ITS INFRASTRUCTURE

Currently, a total of 27 traffic signals operate within the City of Maricopa and the TMP study area. The City controls 15 of these traffic signals, which are concentrated along Smith-Enke Road, Honeycutt Road, Bowlin Road, Porter Road, and MCGH. There are an additional 12 traffic signals located along SR 347 between Cobblestone Farm Drive-North/Lakeview Drive near the City's northern edge and the Ak-Chin Casino entrance drive in the south. These 12 signals are controlled by ADOT, and operational control is maintained by the Tucson District Traffic Operations Center (TOC) in Tucson. The majority of these traffic signals are interconnected with a wireless communications system that theoretically allows the traffic signals to talk to each other. It has been reported, however, that the communications link back to the Tucson District TOC is unreliable and the bandwidth of insufficient to provide proactive, real-time traffic signal monitoring and traffic signal timing changes.

Recently the City of Maricopa added conduit along Honeycutt Road, between Porter Road and White & Parker Road. This conduit was constructed during a recent roadway widening project to provide conduit infrastructure for this portion of the City's future fiber optic backbone. There may be an opportunity to add conduit in other upcoming projects, if the projects are in an area recommended for fiber optic backbone communications.

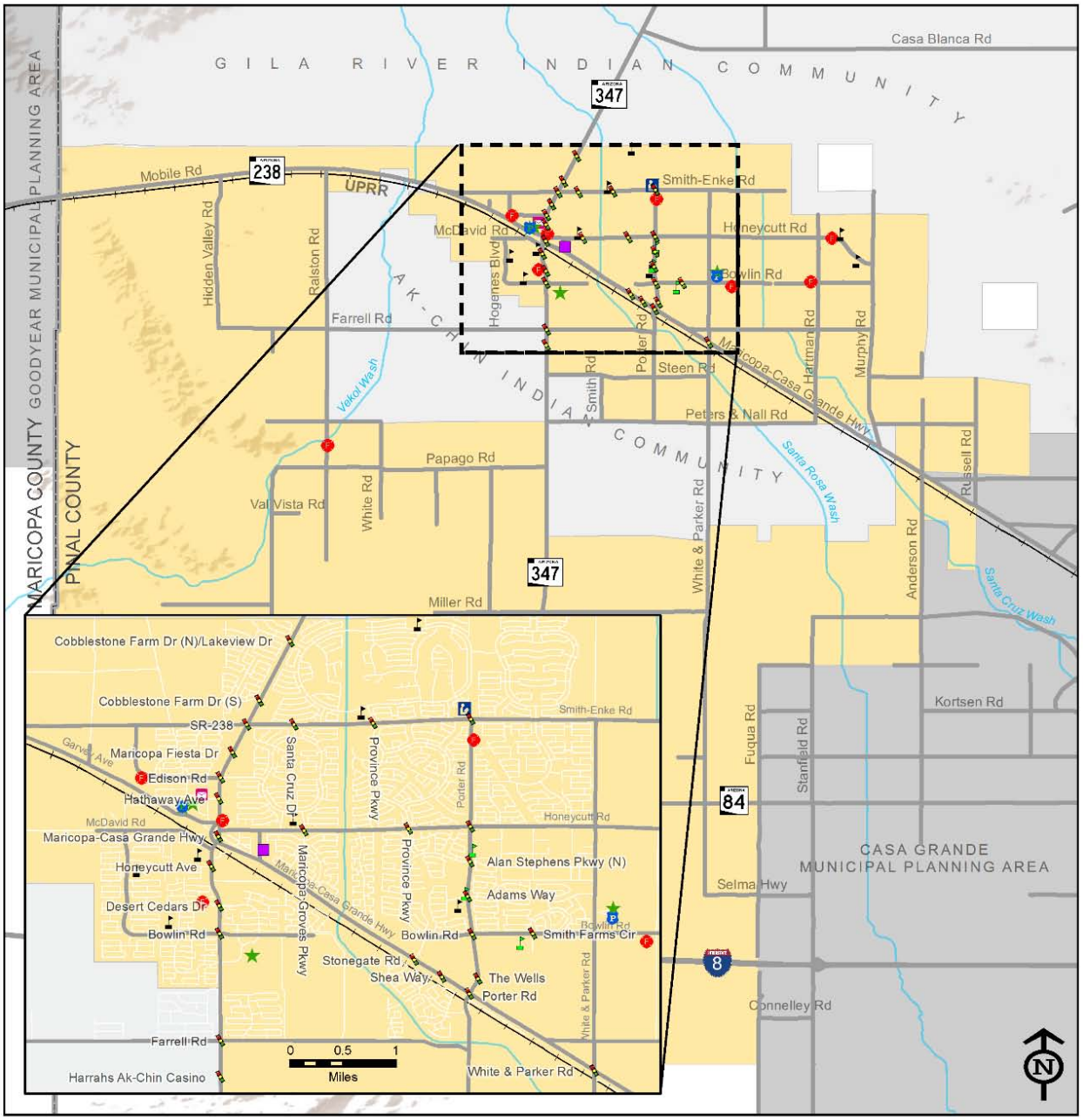
The City of Maricopa currently is constructing a new Public Works Building located just west of the Fire Station on Edison Road, a few blocks west of SR 347. There are plans for a small, traffic signal maintenance shop to be located in the Public Works Building. At this time, no other provision for ITS has been made in the Public Works Building. The City is constructing a 180- to 200-foot-tall communications tower at the Public Works Building site, primarily for use by emergency management use personnel (e.g., police and fire).

The new City Hall is located just north of Bowlin Road on the east side of White & Parker Road. Most City staff are located in City Hall at the present time. Figure 10-1 depicts the existing ITS infrastructure, traffic signals, and City buildings described in this section.

10.3 RECOMMENDED ITS DEPLOYMENT SCENARIO

This section presents recommendations for ITS deployments with timeframes consistent with the entire TMP process. Specifically, ITS deployment scenarios are presented for the 5-, 15-, and 25-year timeframes. Detailed project information has been developed for the short-term timeframe (2016 – 2020), and more general recommendations has been developed for the mid-term (2020 – 2030) and long-term (2030 – 2040) timeframes.

Figure 10-1 | Existing Signals and Points of Interest



Source: City of Maricopa Development Services, Pinal County GIS Database

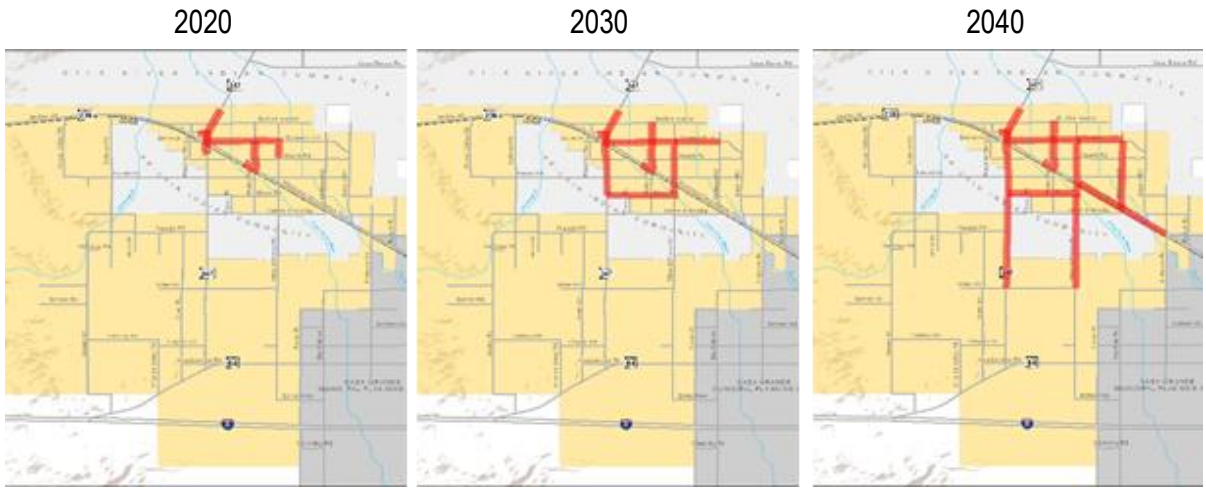
Legend

- Signals
- Charter School
- District School
- District School Office
- Fire Department
- Library
- Police
- Municipal Buildings
- Post Office
- Railroad
- Counties
- Major Washes
- TMP Study Area

0 2 4
Miles

Where possible, ITS deployment scenarios are linked to other roadway improvement projects that are identified in the respective planning timeframes elsewhere in this document. The fiber optic backbone system is anticipated to grow in the direction(s) and at the pace the City grows and certain roadway improvements are constructed. Just as needed roadway improvements have been identified in the respective planning periods, based on projected growth, so also is the anticipated expansion of the ITS fiber optic backbone. Thus, in the 2015 – 2020 timeframe, the fiber backbone is recommended for installation within the existing core areas of the City. As the City grows to the east in the 2020 – 2030 timeframe, the fiber optic backbone system would expand to the east and south. As City growth extends into the central portion of the Study Area, as anticipated in the 2030 – 2040 timeframe, it is recommended that the fiber optic backbone system expand to the south. Figure 10-2 depicts the conceptual nature of the growth of the fiber optic backbone during each of the three planning timeframes.

Figure 10-2 | Years 2020, 2030, and 2040 ITS Implementation Concept



Prepared by Wilson & Company, February, 2015.

The ITS fiber optic backbone will serve to provide connectivity, where intersection traffic sensors may be deployed and signal operations optimized. Intersection signals, not directly connected with the fiber optic backbone network, may be tied into the network wirelessly, where the distance to the backbone is not more than a mile or two and where an unobstructed visual path exists. Design of the fiber optic backbone, therefore, is intended to directly connect as many traffic signals as possible, while providing a path to other intersection signals. Installation of the fiber optic network can be more efficiently achieved, when constructed in conjunction with other roadway projects. Concept design of each stage of the recommended fiber optic network has been made with committed and other anticipated roadway and paving projects in mind.

PRIORITY IMPLEMENTATION PROJECTS FOR THE 2016 – 2020 TIMEFRAME

One of the goals of this chapter of the TMP is to identify very specific, beneficial, and attainable projects for the deployment of ITS within the City of Maricopa. Recommended projects, and their respective timeframes for programming, are shown in Table 10-1. The list of projects has been prioritized, and a project

sequence/timeline similar to a 5-year CIP shows the sequencing of recommended design and construction projects and estimated costs. More thorough scoping and estimating for each of the recommended projects within the 2016 – 2020 timeframe should be conducted during the Phase 2 TMP. More detailed descriptions of the listed projects follows.

Table 10-1 | Year 2020 ITS Project Implementation

Projects		*FY 16*	*FY 17*	*FY 18*	*FY 19*	*FY 20*
Microwave Link to ADOT Tuscon Traffic Ops	▲	$25k				
	⬢	$75k				
Traffic Management Center	▲	$20k				
	⬢		$75k			
Central Signal System	▲	$25k				
	⬢		$75k			
Porter Rd/MCG: Honeycutt to Stonegate	▲		$70k			
- 8 signal connections / 8 CCTV	⬢			$325k		
Honeycutt Rd: Public Works to City Hall	▲			$125k		
- 3 signal connections / 3 CCTV	⬢				$500k	
SR-347: Edison Rd to Desert Ceders (ADOT)	▲	$30k				
	⬢		$165k			
SR-347: Edison Rd to Cobblestone Farm (ADOT)	▲				$45k	
- 4 signal connections / 4 CCTV	⬢					$185k
ITS Planning/Support (Standards, Grant Applications, ...)	▲	$30k	$40k	$50k	$50k	$50k
Consultant Design Support	▲	$130k	$110k	$175k	$95k	$50k
Construction Cost	⬢	$75k	$315k	$325k	$500k	$185k
TOTAL		$205k	$425k	$500k	$595k	$235k

▲ = *Design* ⬢ = *Construction*

DEVELOPMENT OF BASE ITS FACILITIES

The first three projects listed in Table 10-1 address the need for base facilities necessary for ITS operations and control.

Microwave Link to ADOT Tucson District Traffic Operations Center

City of Maricopa and ADOT Tucson District TOC personnel met recently to discuss traffic congestion issues along SR 347 that occur on nearly a daily basis, as commuters leave the City in the morning and return in the evening. These discussions revealed that traffic signals along SR 347 are not progressively timed, i.e., signal timing and other operating parameters do not allow vehicle operators to move or progress from intersection to intersection without stopping based on an established speed. Therefore, motorists using SR 347 experience significant delays, due to multiple stops, trying to get out of Maricopa and head toward the Phoenix metropolitan area in the morning and when returning to the community in the evening.

Tucson District TOC personnel indicated that, while the signals can talk to each other through a wireless communications network, there is not a reliable microwave link with adequate bandwidth between the

ADOT-controlled signals within the City of Maricopa and the Tucson District TOC. This limits ADOT's ability to control and proactively manage the traffic signals along SR 347. That is to say, signal timing changes in response to the demands of roadway users and reconfiguration of signal operations to accommodate the sequence of movement at an intersection cannot be dynamically initiated from the TOC.

ADOT Tucson District TOC personnel requested that the City of Maricopa pursue obtaining a microwave link in order to enhance the ability to control and manage traffic signals. Details of the microwave link are not known at this time and should be developed early in Phase II of the ATP. This recommended improvement should be coordinated with construction of the new communications tower at the Public Works Building to explore whether there is an opportunity to locate appropriate microwave equipment on the communications tower to be built for emergency services communications.

This ITS project is rated as the highest priority for implementation in the near-term, as it has the greatest potential to immediately improve SR 347 traffic flow and bring congestion relief to the citizens of Maricopa. It especially is important in the context of the upcoming SR 347 grade separation roadway improvement project over the UPRR tracks. The grade separation project, recommended to be designed and constructed in FY 2016, offers an opportunity to include ITS infrastructure at intersections affected by this significant improvement project. Incorporating ITS in the project would reduce the cost of installation and establish the initial components of a coordinated, dynamic traffic control system.

Traffic Management Center

Most adjacent cities, including the cities of Mesa and Chandler, and the towns of Gilbert and Queen Creek, have established TMCs as a foundational aspect of city-wide ITS systems. The City of Maricopa should take immediate steps to plan, program, and establish a facility to be used as a dedicated TMC, which is a critical element of an ITS network. A TMC for a city the size of Maricopa is expected to be very modest, with one or two workstations and 2 – 4 overhead monitors to manage the city's traffic signal system and monitor the closed circuit television (CCTV) cameras deployed throughout the City.

This project is recommended to be programmed/designed early in Phase II of the ATP in FY 2016, and constructed/procured in FY 2017. Programming will include: assessing the needs of a TMC; identifying an appropriate location within an existing City building; and identifying what remodeling, HVAC upgrades, UPS, communications, and other supporting elements will be required to provide a reliable mission-critical TMC for the City.

Central Signal System

One of the key operational elements of a TMC is the central signal system software. Central signal system software generally is procured to control the operation of the citywide system of coordinated traffic signals. Central signal systems come with many different features, some of which are fundamental and some that are required. Although other features may be desired, depending on the needs of the City, they may not be necessary. Another key element of the central signal system is the level of required support from the Consultant or Vendor, the developer of the software used to control the central signal system. It is especially important to select an appropriate central signal system software vendor that meets both current needs and has the ability to meet the needs of the City as it grows.

This project to develop procurement specifications (design) for a central signal system is recommended for implementation in FY 2016, with the actual procurement and installation to occur in FY 2017.

FIBER OPTICE BACKBONE INSTALLATION PROJECTS

This section of the TMP identifies four fiber optic backbone projects that together would serve to establish a fiber backbone within the core of the City of Maricopa, especially along SR 347. Each of the projects is programmed to tie-in several of the City's existing traffic signals as part of each project. There are several traffic signals along Smith-Enke Road and at MCGH/White & Parker Road that won't be interconnected by fiber with implementation of these first four projects. These traffic signals, along with any future traffic signals can be tied in wirelessly to the fiber backbone, so that all traffic signals will be able to communicate with the TMC. As the City grows and the ITS backbone is extended, as noted above, these locations would be connected. Each of the four initial fiber backbone installation projects is described below in more detail:

Porter Road from Honeycutt to MCGH/MCGH: Porter Road to Stonegate Road

This project was selected, because it provides the opportunity to tie in a total of eight traffic signals. There currently are five traffic signals located along Porter Way at Honeycutt, Alan Stephens Parkway, Adams Way, Bowlin Road, and the Wells, along with three signals along MCGH at Porter Road, Shea Way, and Stonegate Road. It also is recommended that the City install a minimum of four CCTV cameras, and preferably eight, to be able to provide real-time monitoring of the traffic at each of these traffic signals.

This project has the opportunity to tie together the most traffic signals in the City; therefore, it is recommended as the first fiber backbone project. It is recommended that the design be completed in FY 2017, with construction in FY 2018. The City has expressed an interest in applying for federal funding through the Congestion Mitigation & Air Quality (CMAQ) program as a member of MAG. Depending on whether the City is successful in obtaining a CMAQ grant, it may be prudent to add Honeycutt Road between Porter Road and White & Parker Road (existing conduit), and White & Parker Road from Honeycutt Road to City Hall. This assumes the TMC would be established in City Hall as a part of this project. Estimated project costs presented in Table 10-1 do not include the additional two miles required to accomplish this extension to City Hall.

Edison Road/Honeycutt Road: Public Works Building to City Hall

This project spans the greatest distance and makes key connections between the new Public Works Building (under construction) and City Hall. This project would tie in two traffic signals along Honeycutt Road at Santa Cruz Drive and Province Parkway. CCTV cameras also are recommended at each of these traffic signals. It may also be possible to add one or two CCTVs at signals along SR 347 as part of this project. This would require close coordination with ADOT, both as it relates to the SR 347 grade separation project and because the existing signals along SR 347 are operated by ADOT.

This project is recommended to be designed in FY 2018 and constructed in FY 2019. This project also has the potential to be considered for FY 2019 CMAQ funding through MAG.

SR 347: Edison Road to Desert Cedars Drive

This project essentially includes the project limits for ADOT's SR 347 grade separation project, which is expected to go into design late in calendar year 2015. Although associated roadway improvements are funded by ADOT, this project has been included in the event that ADOT is not planning to install conduit and fiber optic cable as part of this improvement project. It is critical for the City to get a fiber optic path constructed within the bridge structure over the UPRR as part of this project, as this would provide the critical link to the southern portions of the City required to expand the fiber backbone as the City grows. It also would be beneficial to extend the fiber to the north end of the project at Edison Road. This project

potentially could tie-in five traffic signals and provide up to five CCTV cameras for viewing traffic conditions in the SR 347 corridor.

Table 10-1 shows the funding for design would occur in FY 2016 and construction in FY 2017. These are budgetary estimates for what ADOT might require of the City to pay for additional design and construction costs. ADOT has allowed additional improvements requested by local agencies on other projects, but the agency typically requires a city to "pay-to-play," or simply, to pay for the additional design and construction costs that ADOT doesn't have programmed. Hence, this is a budgetary line item in the event ADOT requires local funding for any additional conduit and fiber requested by the City.

SR 347: Edison Road to Cobblestone Farms Drive-North

This project is the continuation of the previous project to install ITS infrastructure elements to Edison Road as part of the SR 347 grade separation project. This is expected to be an ADOT-funded project, although there has been some discussion that it could be a development-funded improvement as well. This project is critical to complete the fiber backbone installation along SR 347 by extending fiber to the current northern limits of the City of Maricopa. This project is expected to tie-in four traffic signals, and it would include installation of four CCTV cameras – one at each of the existing signalized intersections.

Funding for the design of this project is shown in Table 10-1 as occurring in FY 2019, with construction in FY 2020, but there is the potential that this project may have to be accelerated should the SR 347 grade separation become a developer-funded project.

One of the benefits to completing the two fiber backbone projects along SR 347 would be that nine of the 12 traffic signals could be interconnected by fiber optic communications. With a TMC and central signal system software in place and fiber interconnecting these nine signals, a case could be made for the City to assume from ADOT local control and operation of the traffic signals along SR 347. Local management by those who have a vested interest in reducing congestion would aid in maximizing efficiency of signal operations to the benefit of motorists using SR 347.

Fiber optic backbone deployment projects, recommended through FY 2020, are shown in

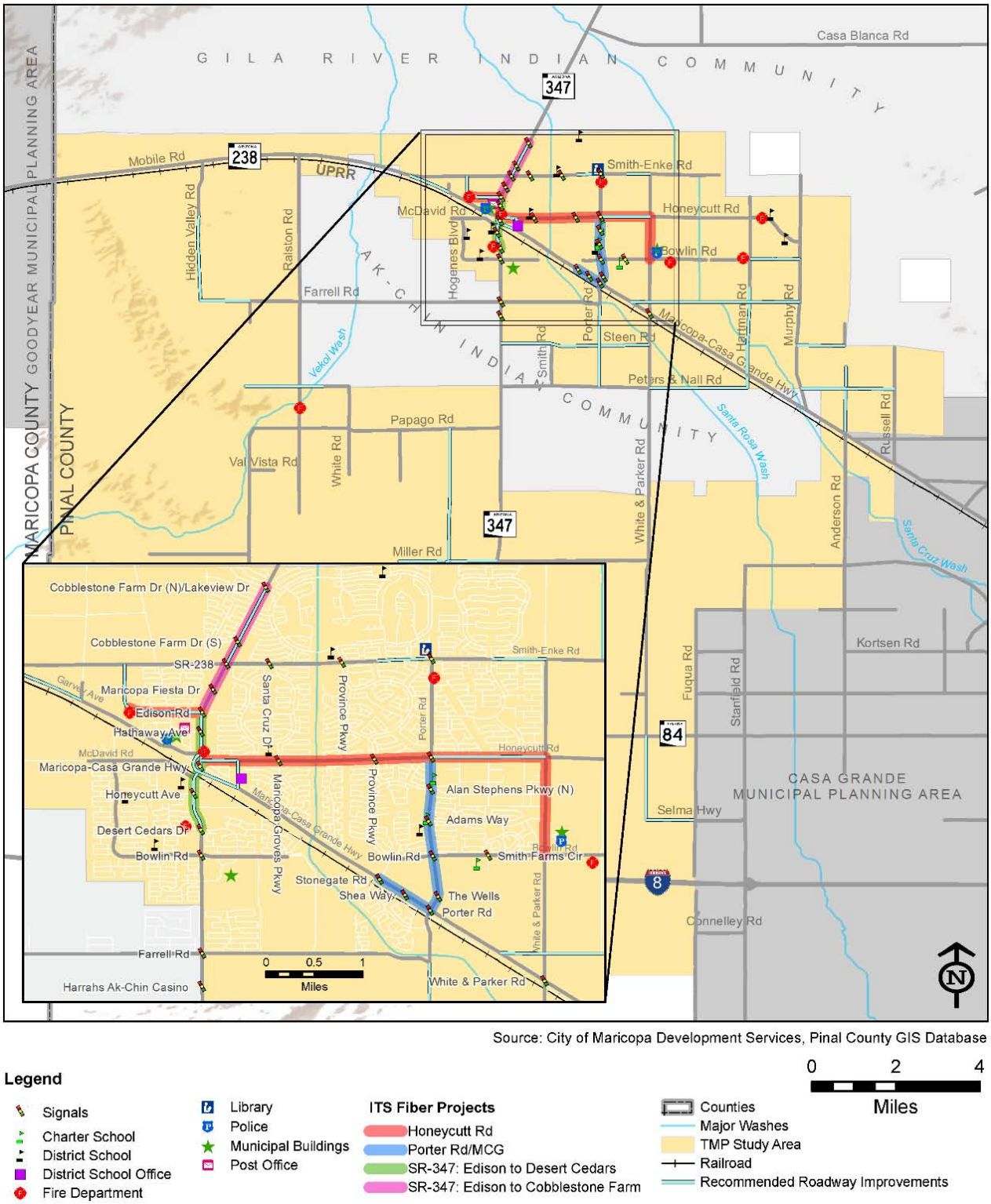
Figure 10-3. These projects are shown alongside committed or recommended paving or other roadway construction projects, where ITS fiber installation may be designed and constructed as part of a larger project.

ITS PLANNING/SUPPORT

Discussions with City staff revealed there is a need for ongoing ITS planning and support to assist City staff in navigating the ITS deployment process. Potential needs identified include:

- establishment of subdivision development standards identifying the minimum conduit and pull box infrastructure required to be installed by the developer at the time half- or full-street improvements are constructed;
- development of ITS standards and operational protocols;
- development of staffing plans for operations and maintenance of the TMC and central signal system;
- assistance with draft grant applications and utility franchise agreements to secure federal grants and other available funding;

Figure 10-3 | Year 2020 Recommended ITS Fiber Network



Source: City of Maricopa Development Services, Pinal County GIS Database

Legend

- Signals
- Charter School
- District School
- District School Office
- Fire Department
- Library
- Police
- Municipal Buildings
- Post Office

ITS Fiber Projects

- Honeycutt Rd
- Porter Rd/MCG
- SR-347: Edison to Desert Cedars
- SR-347: Edison to Cobblestone Farm

- Counties
- Major Washes
- TMP Study Area
- Railroad
- Recommended Roadway Improvements

0 2 4 Miles

- provision of design and construction support to the City on various projects;
- assistance in developing a standard for City traffic signal controllers; and
- assistance in establishing Job Order Contracts for construction and/or maintenance.

It is anticipated that other tasks will be identified as the deployment process progresses. This line item establishes a planning-level cost for additional ITS planning and support that may be required throughout the five-year deployment program.

IMPLEMENTATION PROJECTS FOR THE 2020 – 2030 TIMEFRAME

ITS project recommendations for the 2020 – 2030 timeframe correspond to several of the major roadway improvement projects planned for construction during this period, as identified elsewhere in this document. Table 10-2 presents five recommended ITS projects for the 2020 – 2030 timeframe. Project selection focuses on development of the fiber optic backbone network to the east and south as the City grows in these directions.

Table 10-2 | ITS Fiber Backbone Recommended Projects (FY 2020 – FY 2030)

Projects (FY 2020 - FY 2030)	Length (miles)	Signals (existing)
Honeycutt: White & Parker to Hartman	2	0
White & Parker: Steen to City Hall	2.25	1
Porter: Honeycutt to Smith-Enke Rd	2	2
SR 347: Desert Cedars to Steen Rd	2.25	4
Steen Rd: SR 347 to White & Parker Rd	3	0
Prepared by Wilson & Company, February 2015.		

IMPLEMENTATION PROJECTS FOR THE 2030 – 2040 TIMEFRAME

ITS project recommendations for the 2030 – 2040 timeframe correspond to several of the major roadway improvement projects planned for construction during this period, as identified elsewhere in this document. Table 10-3 presents four recommended ITS projects for the 2030 – 2040 timeframe. The intent of implementing these project is extend the fiber optic backbone further south along SR 347 and White & Parker Road, as the City grows in the central portion of the Study Area.

Table 10-3 | ITS Fiber Backbone Recommended Projects (FY 2030 – FY 2040)

Projects (FY 2030 - FY 2040)	Length (miles)	Signals (existing)
MCG Hwy: White & Parker to Anderson	4.8	1
Hartman: Honeycutt to MCG Hwy	3.7	0
White & Parker: Steen to Miller	5.1	0
SR 347: Steen to Miller	5.1	0
Prepared by Wilson & Company, February 2015.		

The fiber optic backbone extensions planned for the 2030 – 2040 timeframes (as well as those identified for the 2020 – 2030 timeframe) are intended to facilitate growth of the fiber optic backbone in the direction of and in response to the pace of development as the City grows. Should development activity accelerate, the need for roadway improvements and corresponding ITS improvements also should accelerate. Should growth occur at a rate slower than expected, the need for the roadway and ITS improvements would be reduced. Recommendations presented here are intended to provide the City with a flexible plan for development of ITS infrastructure in support of expansion of the City's roadway network.

Figure 10-4 shows the overall recommendations for the ITS fiber backbone and corresponding intersection ITS infrastructure.

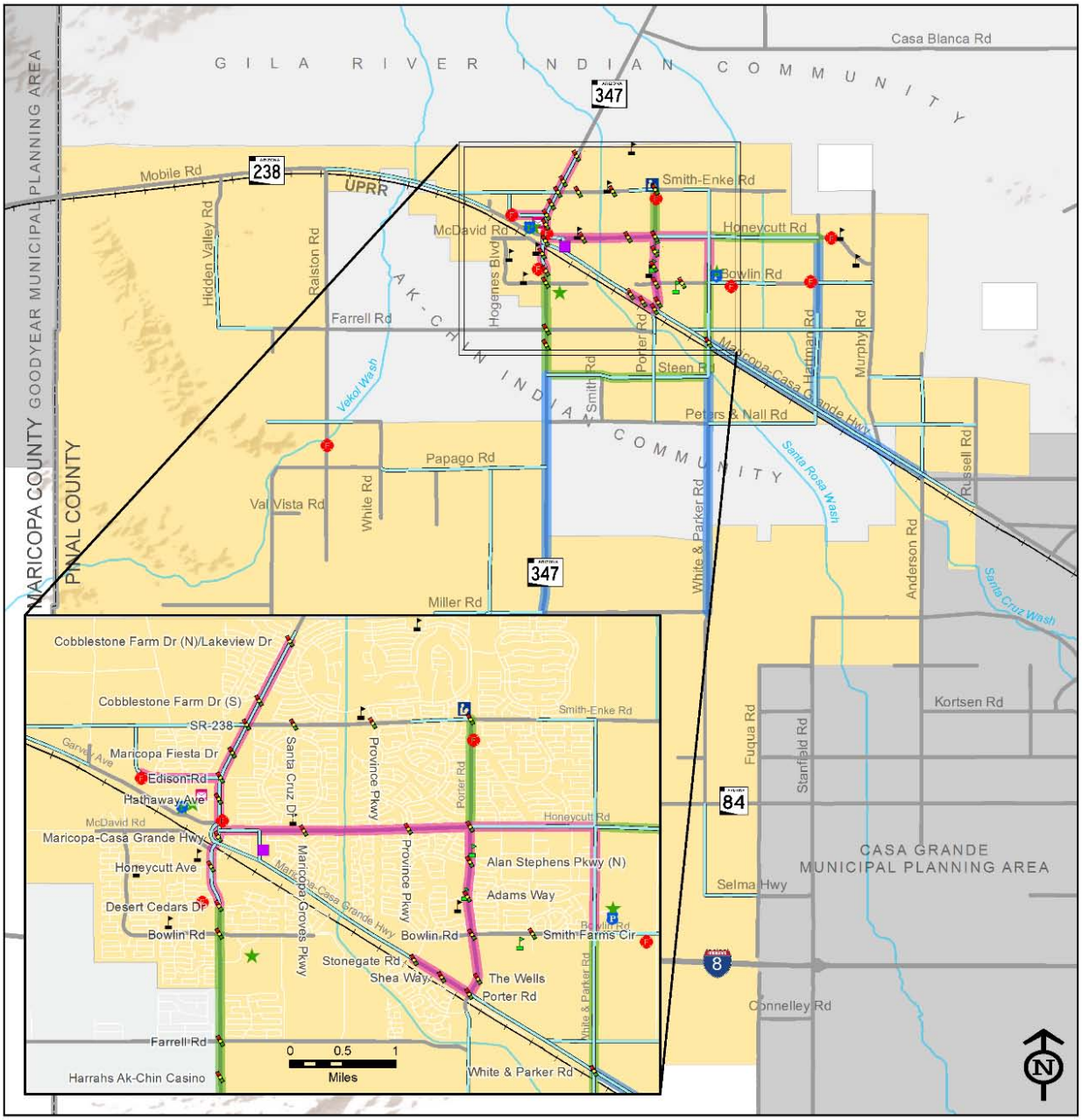
10.4 FUNDING SOURCES

Available City funds may not be able to bear the design and capital construction costs associated with ITS projects recommended for implementation in Section 10.3. As noted earlier, federal funding may be available for ITS projects on a competitive basis with other MAG region agencies. Local tax revenue and other private funding sources also may be available. Table 10-4 provides a summary of potential funding sources that may be available to the City for implementing an ITS with all supporting infrastructure elements.

The City of Maricopa may fund recommended ITS projects by submitting project applications for federal funding, when available. As noted earlier, communities seeking federal funding for ITS projects must complete a Systems Engineering Analysis and achieve compliance with the MAG Regional ITS Architecture. Maricopa also should immediately pursue the use of private funds as a potential funding source to assist in deploying ITS elements, including traffic signals, CCTV's, conduit and pull box infrastructure, and fiber optic backbone cable. Many jurisdictions in Arizona and the U.S. have subdivision regulations and commercial development conditions in place that require developers to install certain required ITS infrastructure as a condition for approving development plans. Enacting these types of development requirements would provide opportunities for the City of Maricopa to gain needed ITS infrastructure along roadways, where commercial and residential development is occurring. This is a critical method the City may employ to obtain needed infrastructure to reduce or eliminate design and construction investment out of City funds.

Another area to explore for private funding is Franchise Agreements with utility providers. Currently, it appears the City often is required to pay for conduit, pull box, and fiber installations that the local utility providers are installing. For example, the City currently does not receive any infrastructure or right-to-use portions of the communications system it is paying to build for CenturyLink and Orbitel. The City should explore opportunities to modify the Franchise Agreements to include provisions that infrastructure (e.g., separate dedicated conduit and pull boxes) is installed exclusively for City use, that portions of fiber optic backbone cables are dedicated for City use, and other similar type requirements that would benefit the City. The City also may want to consider requiring utility providers to pay for City infrastructure, when the utility providers are constructing their facilities within City right-of-way. This is a key method employed by other jurisdictions to leverage development occurring within their boundaries to share in the cost of ITS infrastructure needed to provide up-to-date transportation management and other City services.

Figure 10-4 | Year 2040 Recommended ITS Fiber Network



Source: City of Maricopa Development Services, Pinal County GIS Database

Legend

- Signals
- Charter School
- District School
- District School Office
- Fire Department
- Library
- Police
- Municipal Buildings
- Post Office

ITS Fiber Implementation Schedule

- 2020
- 2030
- 2040

- Railroad
- Counties
- Major Washes
- TMP Study Area
- Recommended Roadway Improvements

0 2 4 Miles

Table 10-4 | Summary of Potential Funding for ITS Projects

Revenue Sources	Description
Congestion Mitigation & Air Quality Program (CMAQ)	Provides funds for various types of projects to improve air quality, by reducing transportation related emissions in non-attainment and maintenance areas under the Clean Air Act. Funding requests require project-specific information pertaining to expected change in travel speed, daily traffic volumes, and project length/area.
Highway User Revenue Fund	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 of the state. These collections include gasoline and use fuel taxes, motor carrier fees, vehicle license tax, motor vehicle registration fees, and other miscellaneous fees. These revenues are deposited into the HURF and then distributed to the cities, towns, counties, and the State Highway Fund. The City of Maricopa can request this funding through the Maricopa Association of Governments (MAG) Transportation Improvement Program (TIP).
Vehicle License Tax (VLT)	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. The VLT revenue is distributed to the HURF, Cities/Towns, and Counties.
Local Transportation Excise Tax	Cities can adopt additional transportation excise taxes ranging between 0.2% and 0.5%. The City of Maricopa does not have a transportation excise tax in place.
Private Funds	These funds are provided by private land developers usually expended as part of a land development project.
	Prepared by Wilson & Company, February 2015.

11.0 PLANNING-LEVEL COST ESTIMATES

The Transportation Master Plan document prepared for the City of Maricopa outlines various improvements for the near-term (through year 2020), mid-term (through year 2030) and long-term (through year 2040) timeframes. Planning-level costs were established for each of the recommended improvements in order to provide a framework for the order of magnitude of costs associated with specific project recommendations. These planning-level costs were based on generalized costs for various facility types. Table 11-1 provides the assumptions made and sources used in the derivation of project cost estimates. It is important to note that roadway costs do not include utilities, right of way acquisition, special aesthetic treatments, or design and construction management costs. Additionally, while these planning-level costs provide a frame of reference, costs for individual projects ultimately will be refined, based on more detailed engineering analyses prior to inclusion in future Capital Improvement Programs (CIPs).

Table 11-1 | Planning-Level Cost Estimate Assumptions

Improvement	Cost	Source
Roadway (New Construction and Complete Reconstruction Costs - 20% Discount for Widening)		
Parkway	$1,342,000 per lane mile	City of Maricopa and DMJM Harris estimates from Regional Transportation Plan Update (2008) adjusted for inflation using RSMeans Construction Cost Indices for 2007 and 2015 retrieved at: http://rsmeansonline.com/References/CCI/3-Historical%20Cost%20Indexes/1-Historical%20Cost%20Indexes.PDF, July 8, 2015.
Principal 1 Arterial	$1,013,000 per lane mile	
Minor Arterial	$915,000 per lane mile	
Collector	$757,000 per lane mile	
All-Weather Crossing	$145 per square foot	Florida Department of Transportation (FDOT), Transportation Cost Reports. April 29, 2014, at: http://www.dot.state.fl.us/planning/policy/costs Assuming high cost for concrete deck/pre-stressed girder- simple span (long and medium span bridges).
Transit		
Minivan	$37,000	Operating Budget for FY 2015/2016 provided by City of Maricopa and grown 10% annually to FY 2019/2020.
Bus	$120,000	
Trails		
Complete Street Upgrade	$380,000	Bushell, Max; Poole, Bryan; Rodriguez, Daniel; Zegeer, Charles. (July, 2013). Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners and the General Public at: www.walkinginfo.org/download/PedBikeCosts.pdf. Complete Streets Upgrade includes average costs for two bike lanes and one unpaved multi-use trail. Cost of Trails assumes average cost for unpaved multi-use trail.
Trails	$120,000	
		Prepared by Wilson & Company, February 2015.

Table 11-2 provides a summary of the respective strategies for each implementation timeframe and planning level costs associated with each strategy. Figure 1 illustrates the relative costs by mode for each timeframe.

Table 11-2 | Strategies for Implementation Timeframe and Planning-Level Costs

Project Extents	Description	Quantity	Unit	Unit Cost	Total Cost
	Year 2020				**$23,911,899**
	Roadway				**$12,536,000**
SR 347, Cobblestone Farm Dr. (south) to Cobblestone Farm Dr. (north)/Lakeview Dr.	Widen to provide 3 lanes in northbound direction (6 lanes total)	Based on detailed estimate			$150,000
Intersection of SR 347 and Smith-Enke Rd.	Upgrade the intersection at SR 347/ Smith-Enke Rd	1	Intersection	$100,000*	$100,000
SR 347, Edison Rd. to Lakeview Dr.	Conduct Corridor Study to determine the feasibility of upgrading to a 6-lane Urban Arizona Parkway	1	Study	$400,000*	$400,000
SR 347, Lakeview Dr. to I-10	Conduct Corridor Study to determine the feasibility of upgrading to a 6-lane Arizona Parkway with associated improvements at Riggs Rd, Old Maricopa Rd, and I-10 Traffic Interchange	1	Study	$600,000*	$600,000
Multiple roadway paving projects	Upgrade all unpaved roads forecast to carry 500 vehicles per day or more in Year 2020	34.2	miles	$330,000	$11,286,000
	Transit				$2,145,899
FY 2015/2016 Operating Costs					$294,000
FY 2016/2017 Operating Costs					$323,400
FY 2017/2018 Operating Costs					$355,740
FY 2018/2019 Operating Costs					$391,314
FY 2019/2020 Operating Costs					$430,445
Fleet Improvements		3	minivans	$37,000	$111,000
		2	buses	$120,000	$240,000
	Trails				$7,270,000
Smith-Enke Rd., SR 347 to Desert Greens Dr.	Complete Street Upgrade	1.3	miles	$380,000	$494,000
Smith-Enke Rd., Porter Rd. to Chase Dr.	Complete Street Upgrade	0.5	miles	$380,000	$190,000
Garvey Ave., Green Rd. to SR 347	Complete Street Upgrade	1.2	miles	$380,000	$456,000
McDavid Rd., Ak-Chin Boundary to SR 347	Complete Street Upgrade	2.0	miles	$380,000	$760,000

Table 11-2 | Strategies for Implementation Timeframe and Planning-Level Costs (Continued)

Project Extents	Description	Quantity	Unit	Unit Cost	Total Cost
Year 2020 (Continued)					
Trails (Continued)					
Honeycutt Rd., Plainview St. Extension to Porter Rd.	Complete Street Upgrade	1.7	miles	$380,000	$646,000
Hogenes Blvd., McDavid Rd. to Bowlin Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Bowlin Rd., Hogenes Blvd. to Santa Rosa Wash	Complete Street Upgrade	1.5	miles	$380,000	$570,000
Bowlin Rd., Porter Rd. to White & Parker Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Farrell Rd., SR 347 to Porter Rd.	Complete Street Upgrade	2.0	miles	$380,000	$760,000
Maricopa-Casa Grande Hwy., Stonegate Dr. to Porter Rd.	Complete Street Upgrade	0.6	miles	$380,000	$228,000
SR 347, Desert Cedars Dr. to Farrell Rd	Complete Street Upgrade	1.3	miles	$380,000	$494,000
Porter Rd., Smith-Enke Rd. to Maricopa-Casa Grande Hwy.	Complete Street Upgrade	2.6	miles	$380,000	$988,000
Santa Rosa Wash Trail, GRIC to Porter Rd.	Trail	4.4	miles	$120,000	$528,000
Homestead Trail, GRIC to Bowlin Rd.	Trail	3.3	miles	$120,000	$396,000
ITS					$1,960,000
ITS Improvements					$1,960,000

Table 11-2 | Strategies for Implementation Timeframe and Planning-Level Costs (Continued)

Project Extents	Description	Quantity	Unit	Unit Cost	Total Cost
Year 2030					$31,582,600
Roadway					$28,174,600
Honeycutt Rd., White & Parker Rd.to Hartman Rd.	Widen to 4-lane Arterial including half span of all-weather crossing of Santa Cruz Wash (36' wide by 300' long)	2	miles	$3,660,000	$7,320,000
		10,800	SF of all-weather crossing	$145	$1,566,000
SR 347, Lakeview Dr. to I-10	Implement capacity improvements/upgrades as determined by Corridor Study	13.7	miles	Project Cost to be determined in Study	
SR 347, Edison Rd. to Lakeview Dr.	Implement capacity improvements/upgrades as determined by Corridor Study	1.5	miles	Project Cost to be determined in Study	
White & Parker Rd., Maricopa-Casa Grande Hwy. to Smith-Enke Rd.	Widen to 2 lanes with a center-turn lane, including intersection improvements (Arterial)	3.3	miles	$1,830,000	$6,039,000
White & Parker Rd., Steen Rd. to Maricopa-Casa Grande Hwy.	Widen to 4-lane Collector with improved at-grade railroad crossing and all-weather crossing of the Santa Rosa Wash (72' wide by 350' long)	0.7	miles	$3,028,000	$2,119,600
		1	at-grade crossing	$500,000*	$500,000
		25,200	SF of all-weather crossing	$145	$3,654,000
Anderson Rd., Steen Rd. to ~ ½ mile south	Pave roadway connection	0.5	miles	$1,514,000	$757,000
Bowlin Rd., White & Parker Rd. to Anthony Blvd.	Construct 4-lane Arterial with all-weather crossing of Santa Cruz Wash (72' wide by 175' long)	1.2	miles	$3,660,000	$4,392,000
		12,600	SF of all-weather crossing	$145	$1,827,000
Transit					**TBD**
Transit Improvements		To be determined by local assessments			

Table 11-2 | Strategies for Implementation Timeframe and Planning-Level Costs (Continued)

Project Extents	Description	Quantity	Unit	Unit Cost	Total Cost
Year 2030 (Continued)					
	Trails				$3,408,000
Smith-Enke Rd., White & Parker Rd. to Santa Cruz Wash	Complete Street Upgrade	1.0	miles	$380,000	$380,000
SR 347, Farrell Rd. to Steen Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Peters & Nall Rd., Porter Rd. to White & Parker Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
White & Parker Rd., Peters & Nall Rd. to Steen Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Bowlin Rd., Anthony Blvd. to Hartman Rd.	Complete Street Upgrade	0.5	miles	$380,000	$190,000
Hartman Rd., Honeycutt Rd. to 1/2 mile south of Bowlin Rd.	Complete Street Upgrade	1.5	miles	$380,000	$570,000
Santa Cruz Wash Trail, Smith-Enke Rd. to Maricopa-Casa Grande Hwy.	Trail	4.0	miles	$120,000	$480,000
Santa Rosa Wash Trail, Porter Rd. to Peters & Nall Rd.	Trail	3.2	miles	$120,000	$384,000
Vekol Wash Trail, GRIC to McDavid Rd.	Trail	2.2	miles	$120,000	$264,000
	ITS				**TBD**
ITS Improvements		To be determined by local assessments			

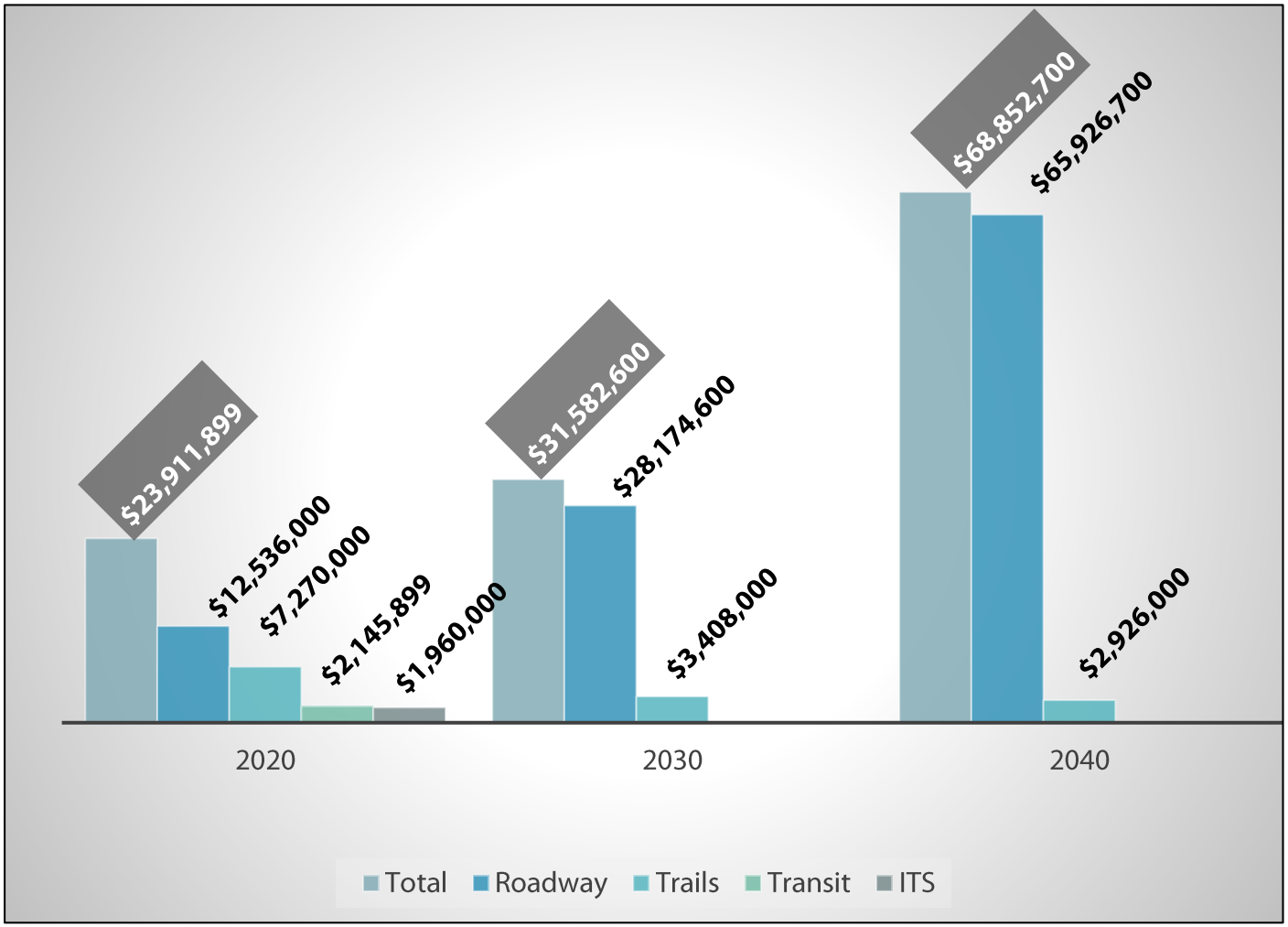
Table 11-2 | Strategies for Implementation Timeframe and Planning-Level Costs (Continued)

Project Extents	Description	Quantity	Unit	Unit Cost	Total Cost
Year 2040					**$68,852,700**
Roadway					$65,926,700
Maricopa-Casa Grande Hwy., White & Parker Rd. to Russell Rd.	Reconstruct as a 4-lane Arizona Parkway with all-weather crossing of Santa Cruz Wash (76' wide by 375' long)	7.3	miles	$5,368,000	$39,186,400
		28,500	SF of all-weather crossing	$145	$4,132,500
Maricopa-Casa Grande Hwy., Plainview St. Extension to White & Parker Rd.	Widen to 4-lane Arterial with all-weather crossing of Santa Rosa Wash (36' wide by 250')	1.6	miles	$3,660,000	$5,856,000
		9,000	SF of all-weather crossing	$145	$1,305,000
Porter Rd., Santa Rosa Dr. to Farrell Rd.	Widen to 4-lane Collector with all-weather crossing of Santa Rosa Wash (72' wide by 325' long)	0.4	miles	$3,028,000	$1,211,200
		23,400	SF of all-weather crossing	$145	$3,393,000
SR 238, Ralston Rd.to SR 347	Widen to 4-lane Arterial	1.8	miles	$3,660,000	$6,588,000
Papago Rd., White Rd.to SR 347	Widen to 2 lanes with a center-turn lane (Arterial)	2.1	miles	$2,026,000	$4,254,600
Transit					TBD
Transit Improvements		To be determined by local assessments			
Trails					$2,926,000
Honeycutt Rd., Hartman Rd. to Murphy Rd.	Complete Street Upgrade	1.2	miles	$380,000	$456,000
Steen Rd., Hartman Rd. to Murphy Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Peters & Nall Rd., Hartman Rd. to Murphy Rd.	Complete Street Upgrade	1.0	miles	$380,000	$380,000
Hartman Rd., GRIC to Peters & Nall Rd.	Complete Street Upgrade	4.5	miles	$380,000	$1,710,000
ITS					TBD
ITS Improvements		To be determined by local assessments			

Prepared by Wilson & Company, February 2015.

*Estimated values based on engineering judgment and local conditions rather than on sourced documents.

Figure 11-1 | Relative Costs by Implementation Year and Mode



REGIONAL CONNECTIVITY PLAN

12.0 REGIONAL CONNECTIVITY PLAN

The RCP has been prepared to provide the City of Maricopa with a review and analysis of regional connectivity and alternative future alignments for the Val Vista and Anderson parkway corridors. This review and analysis separately addresses (1) the two parkway corridors relative to anticipate growth and travel demand with the Maricopa MPA and (2) the wider ramifications of regional connectivity within the perspective of Central Arizona and the Sun Corridor. The RCP also addresses implications of the future conceptual I-11, also referred to as the Hassayampa Freeway, relative to these two parkway corridors and transportation effects associated with this major facility passing through the central portion of the MPA.

12.1 PURPOSE

This RCP specifically examines connectivity needs associated with the regional roadway network based on a long-range growth scenario associated with Buildout of the City of Maricopa and surrounding communities. As noted earlier, Buildout is defined as the expected growth of population and employment over a 40 to 60 year period, i.e., Buildout identifies a theoretical maximum amount of housing and population implied by existing development, approved developments, and the general land use plan. Datasets used for the ATP studies area consistent with MAG and ADOT Buildout projections for Central Arizona. The primary objectives of analyses presented for the RCP are to:

- Examine the MPA roadway network to assure functions and capacity match projected growth, if the City and surrounding communities were to develop to the full potential expressed by land use and development patterns of adopted General Plans;
- Plan for multimodal connections with other Pinal and Maricopa County communities; and
- Provide long-term guidance for right-of-way requirements for regional facilities.

12.1.1 REGIONAL HIGHWAY DEVELOPMENT

Regional highway proposals, specifically Val Vista and Anderson parkway corridors, were examined through a review of relevant studies that have focused on highway network elements potentially affecting the roadway network and transportation system of the Maricopa MPA. The most prominent of these studies are the *Hidden Valley Framework Study* conducted by MAG and the 2008 RTP Update. Development of the RCP has been based on an investigation of previous recommendations related to regional connectivity in the Maricopa MPA and confirmation and/or modification of previous recommendations, based on changes in anticipated land uses that have occurred since completion of those studies. Recommendations of the RCP are related to roadway connectivity, facility type, and associated right-of-way. Specific alignments of future roadways will be the subject of future detailed corridor studies and engineering analyses.

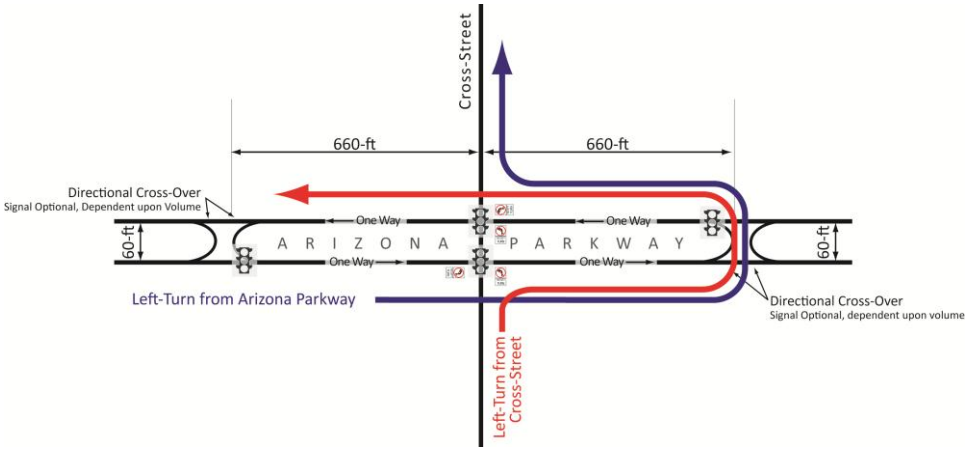
12.1.2 REGIONAL CONNECTIVITY

The relationship of Maricopa to communities in Central Arizona and the Sun Corridor was examined to identify potential issues, opportunities, and constraints associated with the future Hassayampa Freeway corridor, which currently is routed through the central portion of the Maricopa MPA. This examination and assessment focused on identifying likely geometric and design parameters for this proposed Interstate facility to aid in protecting future rights-of-way when a preferred alignment is adopted. The analysis also aided in identifying potentially feasible locations for parkway/arterial interchanges with the Hassayampa Freeway.

12.2 BUILDOUT TRANSPORTATION NETWORK ASSESSMENT

The framework for the Buildout transportation network for the Maricopa MPA initially was defined with completion of the *Hidden Valley Framework Study* (August 2009).[19] This MAG study, in which Maricopa was a participant, outlines a long-term plan for major regional highways and transit service in an area generally defined by I-10 on the east, I-8 on the south, SR 85 on the west, and the Gila and Salt rivers on the north. A key facility identified during the *Hidden Valley Framework Study* is the Hassayampa Freeway, which is proposed to be a high-capacity east-west roadway connecting I-10 on the east side of Casa Grande to I-10 in Buckeye in Maricopa County. As defined by the study, this facility would connect with the proposed Loop 303 Spur, a north-south facility connecting I-10 in Goodyear in Maricopa County with I-8 near the southwest corner of the Maricopa MPA. Figure 12-1 shows the regional roadway plan created as a result of the *Hidden Valley Transportation Framework Study*.

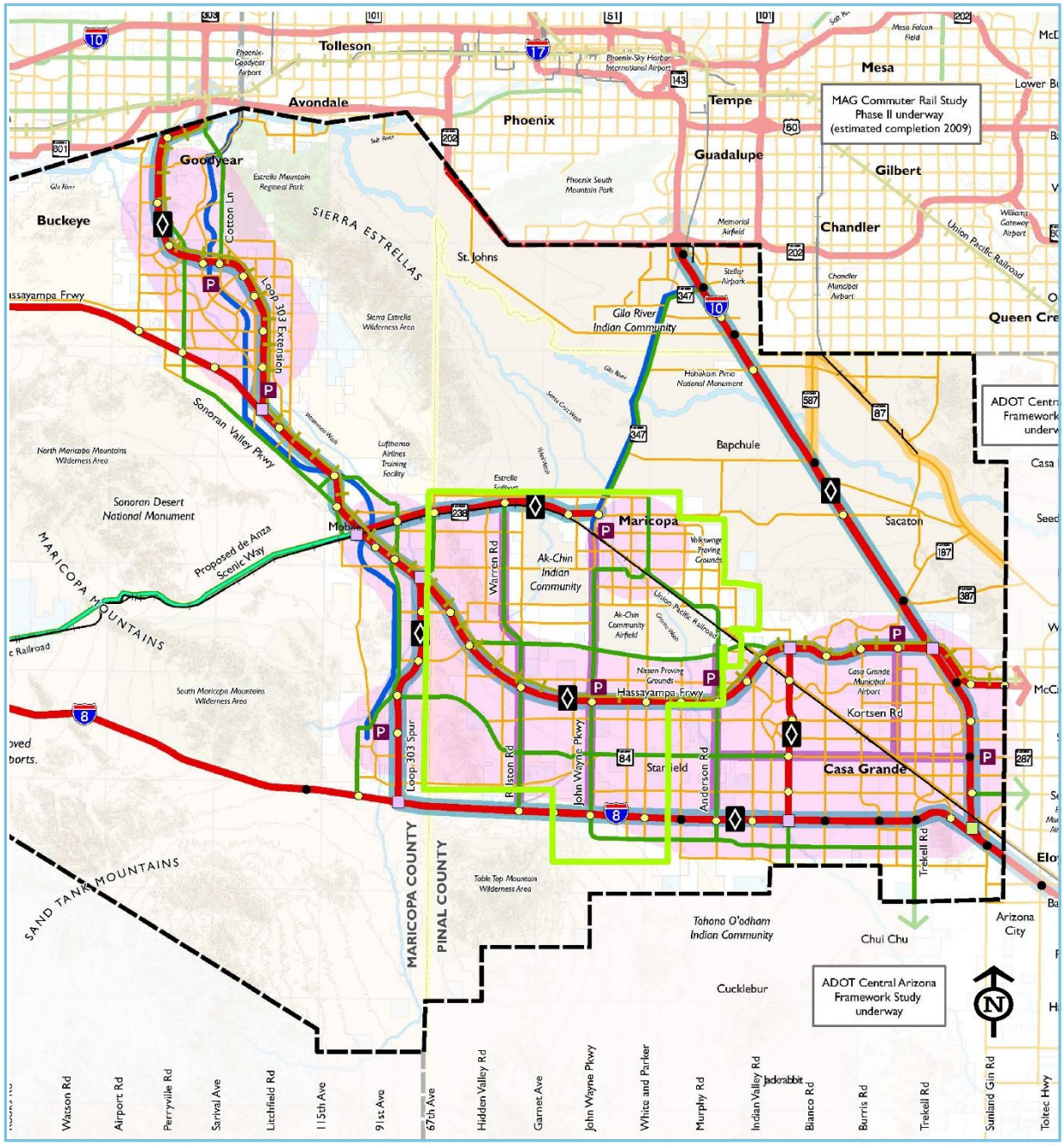
In addition to the two freeway facilities – Loop 303 Spur and Hassayampa Freeway, the *Hidden Valley Framework Study* resulted in identification of several "Arizona Parkway" facilities within the Maricopa MPA. The Arizona Parkway is a design concept (depicted below) that employs indirect left turns at major intersections to expedite through movements and increase safety by reducing conflict points (refer to additional detail regarding this roadway design treatment presented in Appendix F).



The Val Vista Parkway is proposed as an extension eastward from Casa Grande to a connection with the proposed Hassayampa Freeway in the vicinity of Hidden Valley Road. This parkway facility would provide a connection from Central Pinal County at I-10 north of Casa Grande to Western Maricopa County via the Hassayampa Freeway and Loop 303 Extension. Anderson Parkway, SR 347/John Wayne Parkway, and Ralston/Warren Parkway would be major north-south parkway facilities serving the MPA. Black Mountain Road on the boundary between Pinal and Maricopa counties would be developed as a major north-south roadway as well. The northern segment of the Anderson Parkway will be coincident with MCGH, and,

[19] The Hidden Valley Framework Study was based on a planning horizon of 2030 with Buildout defined as "post-2050." The Hidden Valley Framework Study was initiated and completed in the period 2007-2009, meaning Buildout would be interpreted as 40 years plus (2010 to 2050). Therefore, 40 to 60 years, as defined for this ATP, is now viewed as the general range within which Buildout will occur.

Figure 12-1 | I-8 & I-10 Hidden Valley Transportation Framework Plan



because the core area of Maricopa is fully developed, the SR 347/John Wayne Parkway is shown as turning east at Farrell Road to connect with White & Parker Road at MCGH. In addition, SR 84 is proposed to be developed as an Arizona Parkway with a westward extension to the proposed Loop 303 Spur Freeway just inside Maricopa County.

Preparers of the *Hidden Valley Framework Study* transportation network sought to provide a long-term vision for regional connectivity among communities in the 2,000-square-mile study area. Development of the Buildout network analyzed in this RCP relies heavily on this vision proposed in the *Hidden Valley Framework Study*. However, slight differences between the networks exist, reflecting contemporary interpretations of expected growth dynamics of Maricopa and Pinal County. The most notable differences are:

- Modification of the Hassayampa Freeway alignment to reflect recent recommendations associated with the illustrative alignment of the proposed I-11 corridor through Casa Grande, based on the *I-11 and Intermountain West Corridor Study* recently completed for ADOT;
- Revision of the alignment of the planned East-West (Val Vista) Corridor based on recommendations from the *Pinal County East-West Corridor Study*; and
- Conversion of White & Parker Road north of MCGH from a parkway facility to an arterial facility based on recommendations of both the *Pinal County East-West Corridor Study* and acknowledgment by the City of identified utility and drainage constraints.

12.2.1 COMPARISON OF MARICOPA ATP STUDY AREA WITH HIDDEN VALLEY FRAMEWORK STUDY SOCIOECONOMIC DATA

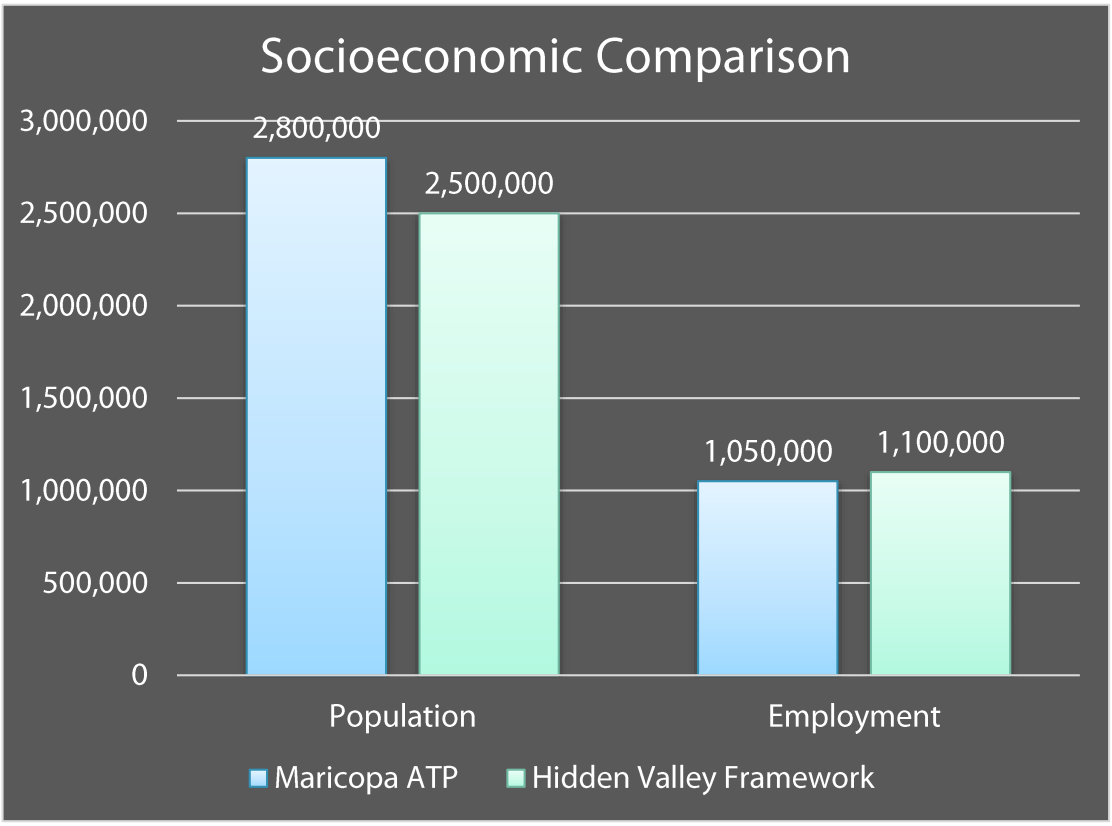
The *Hidden Valley Framework Study* was conducted in 2007-2009, during a period now generally referred to as the Great Recession. Forecasts and projections during that time were influenced by the lack of growth and severe economic impacts of the recession. Since that time, the decennial U.S. Census was completed and the Arizona Department of Administration (ADOA) prepared new projections for the State of Arizona. These projections were interpreted down to the community level during preparation of the recently completed CAG RTP.

The latest projections of population and employment for the City of Maricopa and neighboring communities indicate more population growth is likely than that anticipated during the *Hidden Valley Framework Study*. Figure 12-2 shows the latest projections indicate the Hidden Valley Study Area will grow to 2.8 million within the Buildout period compared to 2.5 million projected during the *Hidden Valley Framework Study*. Employment projections are very similar. Detailed socioeconomic projections (dwelling units, population, and employment) established for the Buildout condition are provided in Appendix I.

12.2.2 BUILDOUT NETWORK PERFORMANCE MODIFICATIONS

The most recent projections of population and employment were employed in conjunction with the MAG Regional Travel Demand Model to evaluate the performance of the modified Buildout Roadway Network. Cutlines were established to aid in assessing the relationship of network capacity to travel demand within and into and out of the MPA. Cutlines are imaginary lines drawn across all of the major north/south and east/west roadways in a selected area of the network. The total volume of traffic crossing the cutline is obtained by adding up all the volumes on the individual roadways that cross the cutline. Volumes on any particular roadway may be higher or lower, depending on variations in the assignment process of the MAG Regional Travel Demand Model. The cutline volume represents the total two-way demand for travel over a broad portion of the network.

Figure 12-2 | Comparison of Socioeconomic Projections

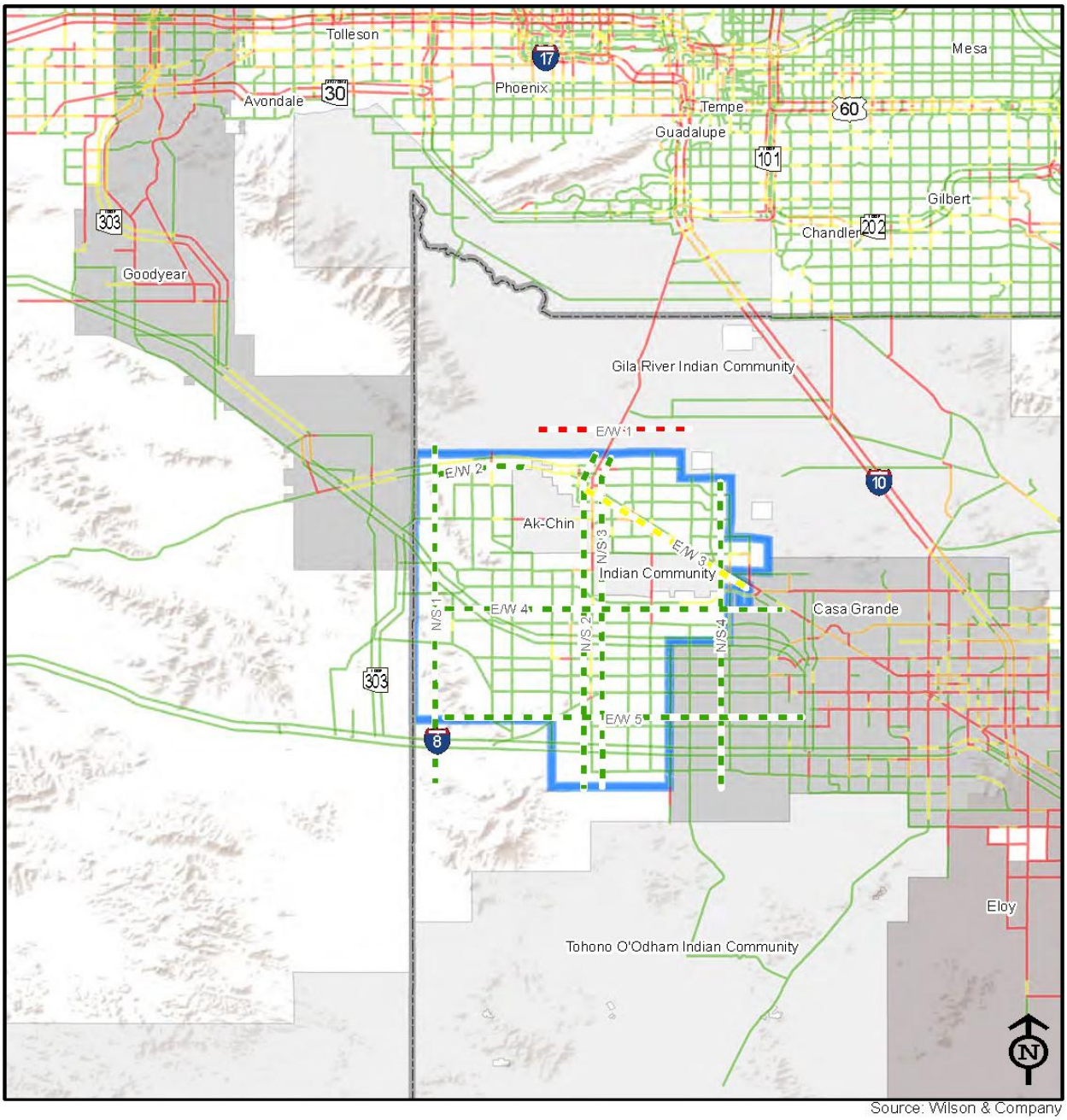


Nine cutlines were established to evaluate the Study Area adopted for the RCP, which represents the travel demand effects of the adjacent regional influences. The Study Area encompasses all of the Maricopa MPA, western Pinal County, the eastern portion of southern Maricopa County, and the southern portion of the Phoenix metropolitan area to the north. LOS was determined for each cutline, the location of which is shown in Figure 12-3. Figure 12-3 shows that the cutline E/W 1 is forecasted to be at LOS F with a value of 1.63, based on the value of 1.00 and higher representing failure of operations. All other cutlines are forecasted to operate at acceptable conditions, with LOS C or better. Specific values for each cutline are summarized in Table 12-1. Additional detailed regarding the LOS for individual facilities in the Buildout Roadway Network are provided in Appendix J.

Previous iterations of the Buildout Roadway Network analysis revealed significant underutilization of three roadway segments proposed in the *Hidden Valley Framework Study* to be Arizona Parkways (refer to Figure 12-1):

- Meadowview Parkway – Meadowview proposed as part of an extension of SR 84 west of SR 347 to the Loop 303 Spur in Maricopa County;
- Connelly Parkway – Connelly Road proposed to connect with SR 347 and parallel I-8 to an extension of Anderson Parkway; and
- Ralston Parkway – Ralston Road proposed to extend south of future Hassayampa Freeway.

Figure 12-3 | Location of Cutlines and LOS Analysis Results: Buildout Roadway Network



Source: Wilson & Company

0 5 10
Miles

Legend

Cutline Level of Service	Link Level of Service	
LOS A - C	LOS A-C	TMP Study Area
LOS D	LOS D	Railroad
LOS E	LOS E	Counties
LOS F	LOS F	

October 27, 2015

Table 12-1 | Cutline Analysis Summary: Buildout Roadway Network

Cutline	Cutline V/C Ratio	Cutline V/C Ratio without I-11
N/S 1	0.39	0.56
N/S 2	0.50	0.63
N/S 3	0.41	0.52
N/S 4	0.40	0.52
E/W 1	1.63	1.63
E/W 2	0.61	0.61
E/W 3	0.84	0.84
E/W 4	0.36	0.51
E/W 5	0.34	0.34
		Prepared by Wilson & Company, July 2015.

Given the underutilization of these facilities, these routes, all identified as potential parkways in the *Hidden Valley Framework Study*, were downgraded to minor arterials in the final version of the Buildout Roadway Network, as recommended in this RCP and presented in the following section.

12.3 RECOMMENDED BUILDOUT ROADWAY NETWORK

Based on findings derived from the deficiency and cutline analyses, recommended improvements were identified for the Buildout Roadway Network (Figure 12-4). Recommendations are defined in terms of the functional classification of major roadways in the RCP Study Area. Figure 12-4 also shows the locations of proposed traffic interchanges relative to freeway facilities expected to serve MPA in 40 to 60 years. In addition, it indicates where railroad grade separations would be desirable as a means of creating a more efficient and safer arterial roadway network. The recommended Buildout Roadway Network also highlights an arterial roadway network that is recommended to provide connectivity to areas of future growth within the Maricopa MPA. This arterial roadway network fully augments the regional roadway connections identified and evaluated during the *Hidden Valley Framework Study*, as modified by this RCP.

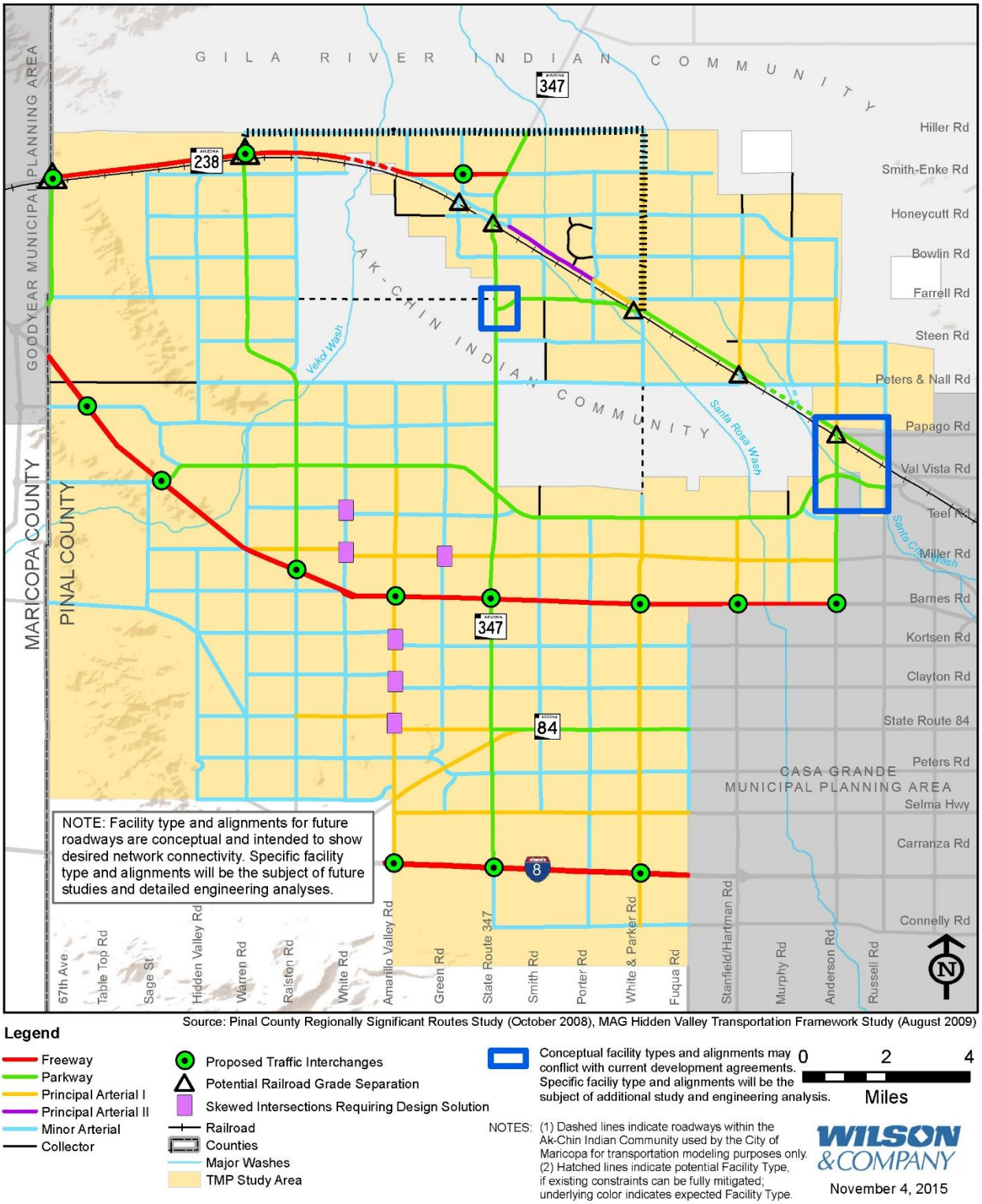
12.3.1 COMPARISON OF RECOMMENDED RCP WITH HIDDEN VALLEY FRAMEWORK STUDY

Assuming the recommended Buildout Roadway Network is implemented as defined, there would be some differences from the network defined during the *Hidden Valley Framework Study*. Table 12-2 provides a comparison of the number of centerline miles of the various roadway facility types identified by the original *Hidden Valley Framework Study*, recommended modifications to the Hidden Valley regional roadway network, and the ultimate RCP recommendations, inclusive of additional arterials to provide connectivity to developing areas with the MPA.

Table 12-2 | Comparison of RCP Network to Hidden Valley Network

Facility Type	Hidden Valley Network	Recommended Modified Hidden Valley Network	Recommended RCP Network
Freeway	33 miles	33 miles	33 miles
Parkway	81 miles	64 miles	64 miles
Arterial	225 miles	230 miles	325 miles
			Prepared by Wilson & Company, July 2015.

Figure 12-4 | Future Roadway Facility Type/Circulation Plan



Source: Pinal County Regionally Significant Routes Study (October 2008), MAG Hidden Valley Transportation Framework Study (August 2009)

Legend

- Freeway
- Parkway
- Principal Arterial I
- Principal Arterial II
- Minor Arterial
- Collector
- Proposed Traffic Interchanges
- Potential Railroad Grade Separation
- Skewed Intersections Requiring Design Solution
- Railroad
- Counties
- Major Washes
- TMP Study Area

Conceptual facility types and alignments may conflict with current development agreements. Specific faciliy type and alignments will be the subject of additional study and engineering analysis.

0 2 4 Miles

NOTES: (1) Dashed lines indicate roadways within the Ak-Chin Indian Community used by the City of Maricopa for transportation modeling purposes only. (2) Hatched lines indicate potential Facility Type, if existing constraints can be fully mitigated; underlying color indicates expected Facility Type.

WILSON & COMPANY

November 4, 2015

12.3.2 NETWORK PERFORMANCE OF RECOMMENDED RCP BUILDOUT ROADWAY NETWORK

Additional analyses were conducted to determine the sufficiency of the recommended Buildout Roadway Network. The analyses continued to support previous recommendations for high-capacity facilities to serve the region, as presented in the *Hidden Valley Framework Study* and subsequent 2008 RTP Update, particularly prior to construction of the future Hassayampa Freeway. In general, the recommended network will provide sufficient capacity to accommodate desired travel and provide access to future development. Notwithstanding recommended improvements, Table 12-3 identifies certain facilities key to achieving adequate connectivity within the MPA will continue to operate with volumes resulting in LOS E and F relative to the future proposed roadway capacity (refer to Appendix J):

Table 12-3 | Key Underperforming Facilities: Buildout Roadway Network

Facility	Operational Direction	Level of Service
	East-West Roadways	
Smith-Enke Road	East of SR 347 Parkway	LOS F
Farrell Road	West of MCGH	LOS E
Papago Road	West of SR 347/Maricopa Road	LOS E
SR 84	West of SR 347/Maricopa Road	LOS F
	North-South Roadways	
SR 347/Maricopa Road	North of the City of Maricopa within the Gila River Indian Community	LOS F
Warren Parkway	South of SR 238 Freeway	LOS E
SR 347 Parkway	South of MCGH	LOS E
Porter Road	South of MCGH	LOS F
Anderson Parkway	South of MCGH	LOS E
		Prepared by Wilson & Company, July 2015.

In addition, MCGH, east of the SR 347 Parkway past Anderson Parkway, and Val Vista Parkway, east of Anderson Parkway, will be operating at close to LOS E conditions.

Opportunities to alleviate these deficiencies will require additional coordination with both the Ak-Chin and Gila River Indian Communities. In addition, opportunities for enhancing north-south connectivity to Maricopa County, such as the Sonoran Valley Parkway between Maricopa and Goodyear, should also be supported in the near-term. Until such time as additional opportunities are identified, implementation of travel demand management strategies, such as carpooling and premium transit service, will be critical in meeting future demand and maintaining acceptable levels of service on MPA roadways.

12.4 TRANSIT LINKAGES

The *Hidden Valley Framework Study* identified the need for enhanced transit service between Maricopa and Phoenix metropolitan area. The potential for creating this service was reviewed with City staff and those preparing the *Southeast Valley Transit Study*. Based on projections of growth, forecasts of travel demand, and an analysis of proposed future transit services provided within the MAG region, the following recommended actions have been identified:

- Year 2020: Continue to support Valley Metro vanpool services to/from the Phoenix metropolitan area and develop regional transit connections to Pinal County area employment centers;
- Year 2030: Implement Express Route Services to enhance connectivity to the Valley Metro Transit System; and
- 2040: Expand Express Route Service, as demand manifests.

12.5 INTELLIGENT TRANSPORTATION SYSTEMS

Regional connectivity does not involve only the building of linkages between roadways and transit services in neighboring communities. Regional connectivity also involves establishing interconnected communications and information systems to expedite general and specific responses to traffic conditions and traffic incidents (e.g., crashes). Therefore, the RCP includes the recommendation that Maricopa move toward creating an efficient and effective ITS with supporting Regional Linkages within the next five years. This initially could take the form of a microwave link to ADOT TOC and a Maricopa TMC. Continued development would include, as appropriate to traffic conditions, the addition of other ITS elements, such as variable speed limit control, dynamic traffic light sequencing, active traffic management (ATM), automated warning systems, dynamic (or variable) message signs (DMS), and road weather information system (RWIS).

APPENDICES