

Queen Creek Small Area Transportation Study

final report

prepared for

Town of Queen Creek

prepared by

Cambridge Systematics, Inc.

with

PSM²

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date

May 2007

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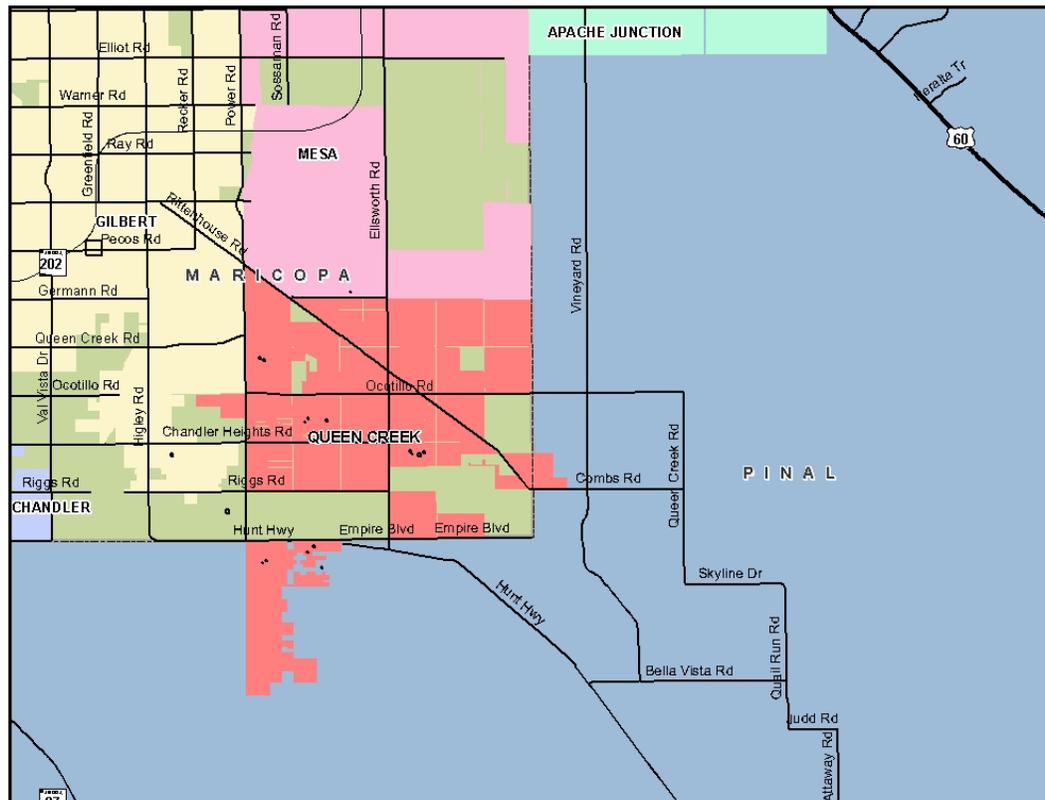
1.0 Introduction

The Queen Creek SATS is intended to help address long-term transportation planning issues for the Town of Queen Creek. The study addressed both roadway and transit improvements that can help alleviate congestion in the Town, and provide mobility for residents and connections to major regional transportation facilities. Funded primarily by ADOT, the SATS provides long-range planning assistance to communities throughout Arizona.

Study Area

The primary study area for the Queen Creek SATS is the Town of Queen Creek. Most of the information presented in this report is for the Town, but given the regional nature of many of the transportation issues in the Town, information for surrounding areas is also presented, where appropriate. Figure 1.1 presents a basic overview of the study area with major roads and surrounding communities identified.

Figure 1.1 Queen Creek Study Area



The study encompassed a wide range of transportation investments, including new or upgraded roads, transit service ranging from local circulators to regional service; potential commuter rail service; and non-motorized transportation, including bicycle, pedestrian, and equestrian facilities.

Organization of Report

This report provides a summary of all of the work completed for the study. The report is organized as follows.

- **Section 2.0** presents the current and future conditions analysis. This includes a review of existing studies, socioeconomic data, transportation systems, and current and future conditions. This section provides a high-level summary of the information collected for Working Paper 1.
- **Section 3.0** presents the project identification and evaluation process. The study included an analysis of numerous roadway, public transportation, and non-motorized investments. This section identifies the projects evaluated and provides a summary of the analysis conducted as part of Working Paper 2.
- **Section 4.0** summarizes the public involvement process conducted as part of the Queen Creek SATS. This process included two open houses and consultation with transportation stakeholders.
- **Section 5.0** summarizes the analysis and provides an implementation plan for the study.

2.0 Current and Future Conditions

This section summarizes information about current and future conditions for the Queen Creek SATS. It is based on the first of two working papers that were generated to support the SATS. The following elements were evaluated for the first working paper:

- Relevant studies by Queen Creek, neighboring jurisdictions, counties, regional agencies, and others were reviewed to support the study. Key relevant information from these studies includes proposed developments, socioeconomic data, and planned and proposed transportation investments.
- Socioeconomic data forms the foundation of the analysis for the study. Potential data sources for population and employment were identified and evaluated and final socioeconomic estimates were generated.
- The current and future transportation system was identified, including existing systems; systems that will be implemented during the course of the plan (i.e., funded systems); and systems that have been identified and planned, but which lack a dedicated source of funding.
- All of this information was used to evaluate current and future conditions on the transportation system, including traffic volumes, ridership, LOS, and related information.

2.1 REVIEW OF STUDIES

A number of studies were reviewed to support Queen Creek SATS. The review of studies supports the overall analysis by identifying proposed improvements, data sources, known transportation issues, and related information. Several types of studies were reviewed for this report, including the following:

- **Queen Creek** studies, including the general plan, previous transportation studies, socioeconomic studies, and others were reviewed for information to support the SATS. Key socioeconomic data were extracted from these sources. In addition, policies and plans from the General Plan and the Town Center Plan were considered as guiding principles for identifying future projects.
- **State and regional** transportation plans and studies, including recently completed ADOT Corridor Definition Studies, the Southeast Maricopa/Northern Pinal County Area Transportation Study, the Maricopa Association of Governments (MAG) Regional Transportation Plan (RTP), and others were reviewed. These provided key input for future investments in and around the study area.

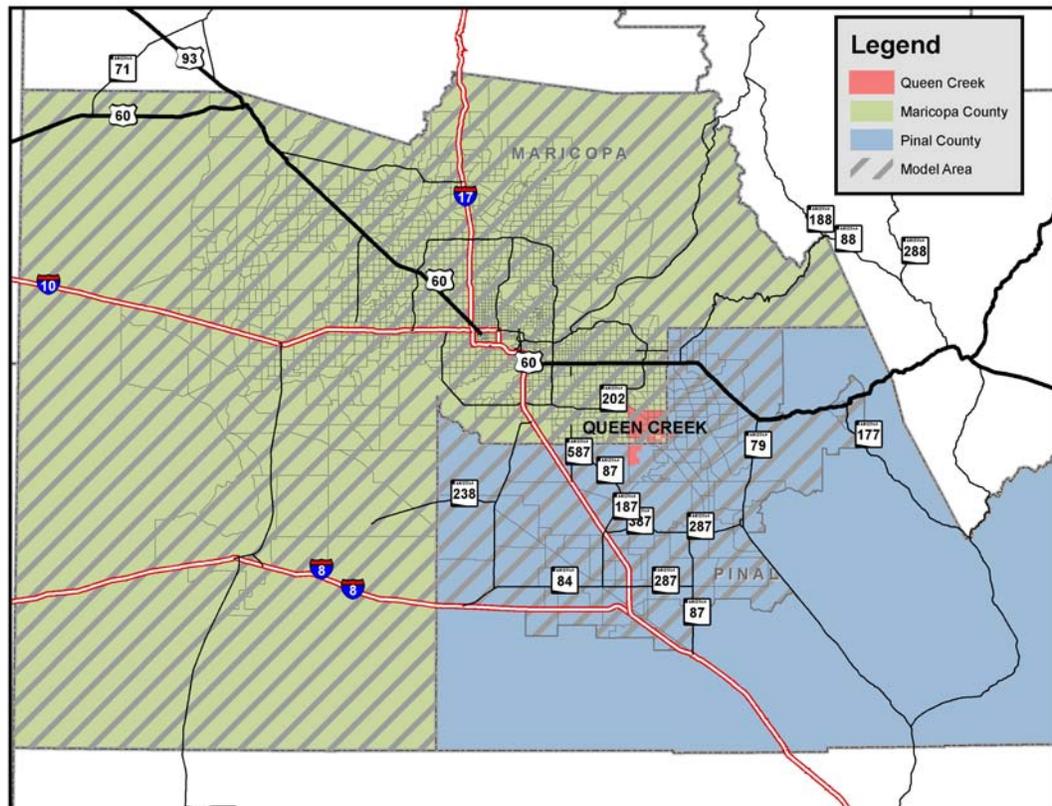
- **Local jurisdiction** plans and studies (including the MCDOT system and corridor studies; Pinal County SATS; and local transportation plans from Mesa, Gilbert, and Apache Junction) were also reviewed. These plans and studies provided important information about the future transportation systems for neighboring jurisdictions.

2.2 SOCIOECONOMIC ESTIMATES AND FORECASTS

Socioeconomic estimates and forecasts are vital for any transportation planning effort, especially in area that is currently experiencing rapid growth, like Queen Creek and the Phoenix metropolitan area. Socioeconomic data are key inputs to travel demand models that are used to forecast traffic volumes, transit ridership, and the distribution of travel in the study area.

The Town of Queen Creek is located primarily in Maricopa County, but it extends into Pinal County. Growth in both the Town and adjacent jurisdictions will impact travel patterns in Queen Creek. For this reason, socioeconomic data were estimated for an area greater than the Town of Queen Creek; the geographic area under study corresponds to the area covered in the MAG travel demand model (Figure 2.1).

Figure 2.1 Queen Creek Model Area Overview



The MAG travel demand model was the primary tool used to estimate current and future traffic volumes in the area. This model includes socioeconomic data for all of Maricopa County and a significant portion of Pinal County. Socioeconomic data were estimated separately for each of three areas:

1. The Town of Queen Creek;
2. The portion of Maricopa County outside of the Town of Queen Creek; and
3. The portion of Pinal County that falls within the MAG travel demand model and outside the Town of Queen Creek.

The data sources used for these estimates and forecasts included the Town of Queen Creek Impact Fee Study, the Arizona DES population estimates and forecasts, the MAG travel demand model, and the Pinal County SATS.

Table 2.1 presents the socioeconomic estimates and forecasts used to support the study for the three separate areas. The Pinal County numbers only include that portion of the County that is included in the MAG travel demand model, not the entire County. For Pinal County, two future numbers are shown. One is derived from the Pinal County SATS and the other from the Arizona DES forecasts.

Table 2.1 Queen Creek Socioeconomic Estimates and Forecasts

| | Queen Creek | | Maricopa County* | | Pinal County** | | |
|------------------------------|-------------|--------|------------------|-----------|----------------|----------------|---------------|
| | 2005 | 2026 | 2005 | 2026 | 2005 | 2026 (SATS) | 2026 (DES) |
| Population | 15,990 | 93,386 | 3,633,145 | 5,641,489 | 205,188 | 1,757,186 | 604,593 |
| Housing units | 5,100 | 29,762 | 1,502,258 | 2,202,115 | 103,779 | 888,742 | 305,788 |
| Households | 5,050 | 29,471 | 1,350,454 | 2,015,581 | 78,872 | 675,444 | 232,399 |
| Employment | 6,250 | 46,835 | 1,736,850 | 3,052,056 | 67,984 | 492,269 | 165,786 |
| Jobs-to- population ratio | 0.39 | 0.50 | 0.48 | 0.54 | 0.33 | 0.28 | 0.28 |

Sources: Arizona Department of Economic Security, 2006; Tischler and Associates, 2006; Maricopa County Association of Governments, 2003; and Pinal County Small Area Transportation Study, 2006.

*Maricopa County data do not include Queen Creek.

** Pinal County data are for the MAG model area only, not the entire County. SATS forecasts are from the Pinal County SATS; and DES forecasts are from the Arizona Department of Economic Security.

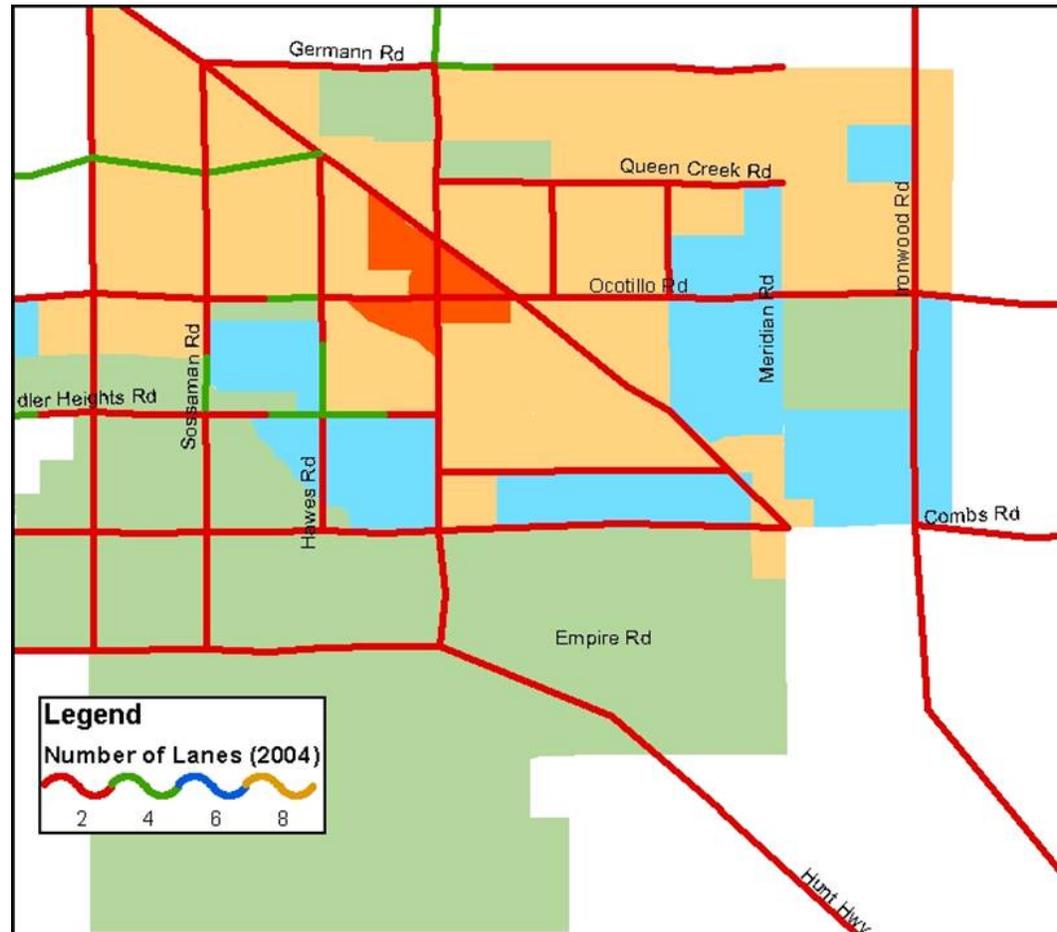
2.3 CURRENT SYSTEM

Roadway Network

This section provides a description of the existing conditions of Queen Creek's roadway network. Most of Queen Creek's roadway network is currently comprised of two-lane roads. However, there are a few short four-lane segments and

some segments that have been updated to three lanes. It is likely that plans will call for these segments to be updated to four or more in the future. The current number of lanes is shown in Figure 2.2.

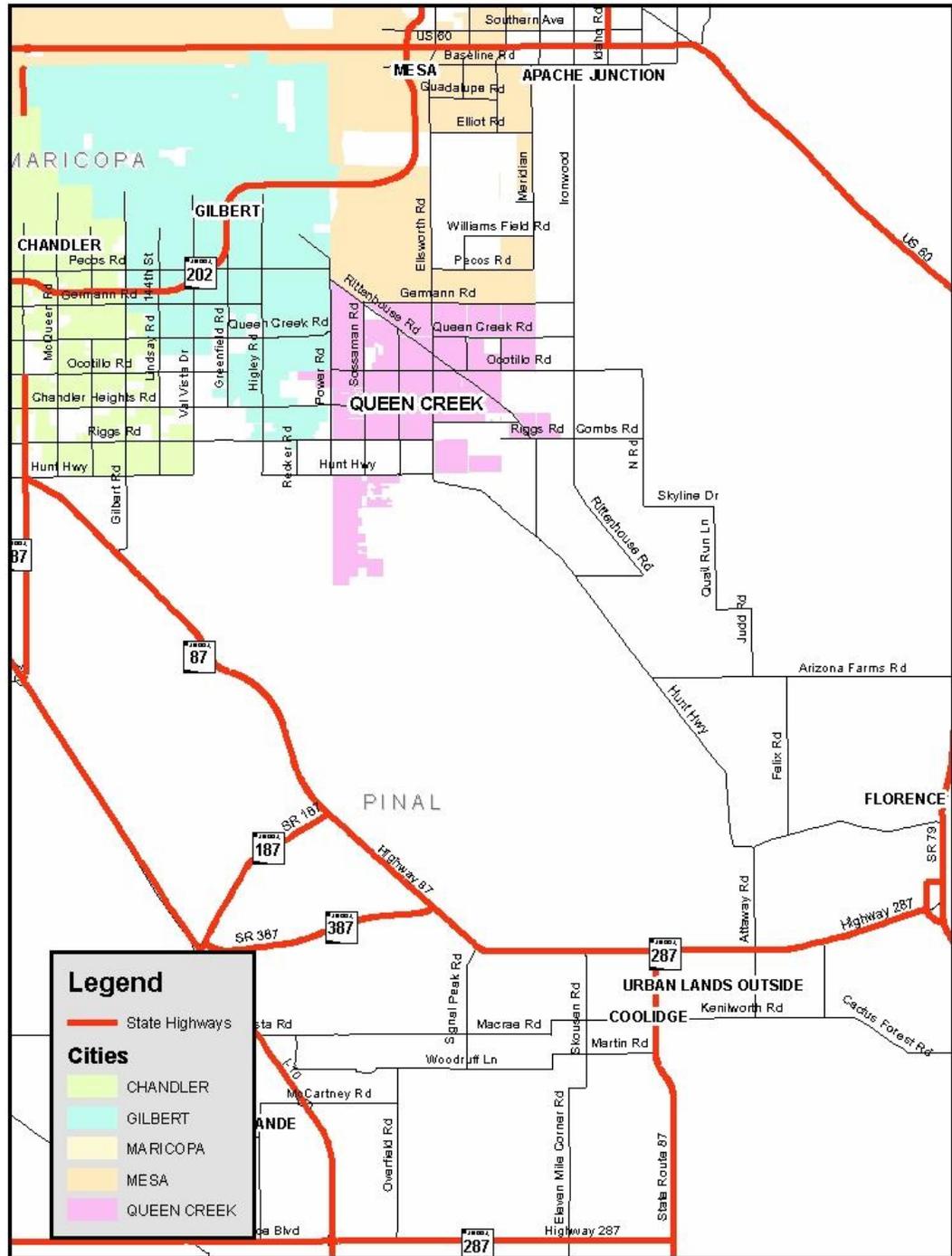
Figure 2.2 Number of Lanes, 2004



Speed limits on arterials within Queen Creek vary between 35 and 50 miles per hour (mph). The roads with the highest speed limits are Ellsworth and Ocotillo Roads, with speed limits between 45 and 50 mph. Principal arterials, such as Power, German, and Riggs Roads, have speed limits in a range between 35 and 45 mph.

Queen Creek is relatively isolated from the Arizona state highway system. Currently, there are several highways close to Queen Creek, but none that touch the Town itself (Figure 2.3).

Figure 2.3 Existing and Future Highways Influencing the Area



The nearby highways include the following:

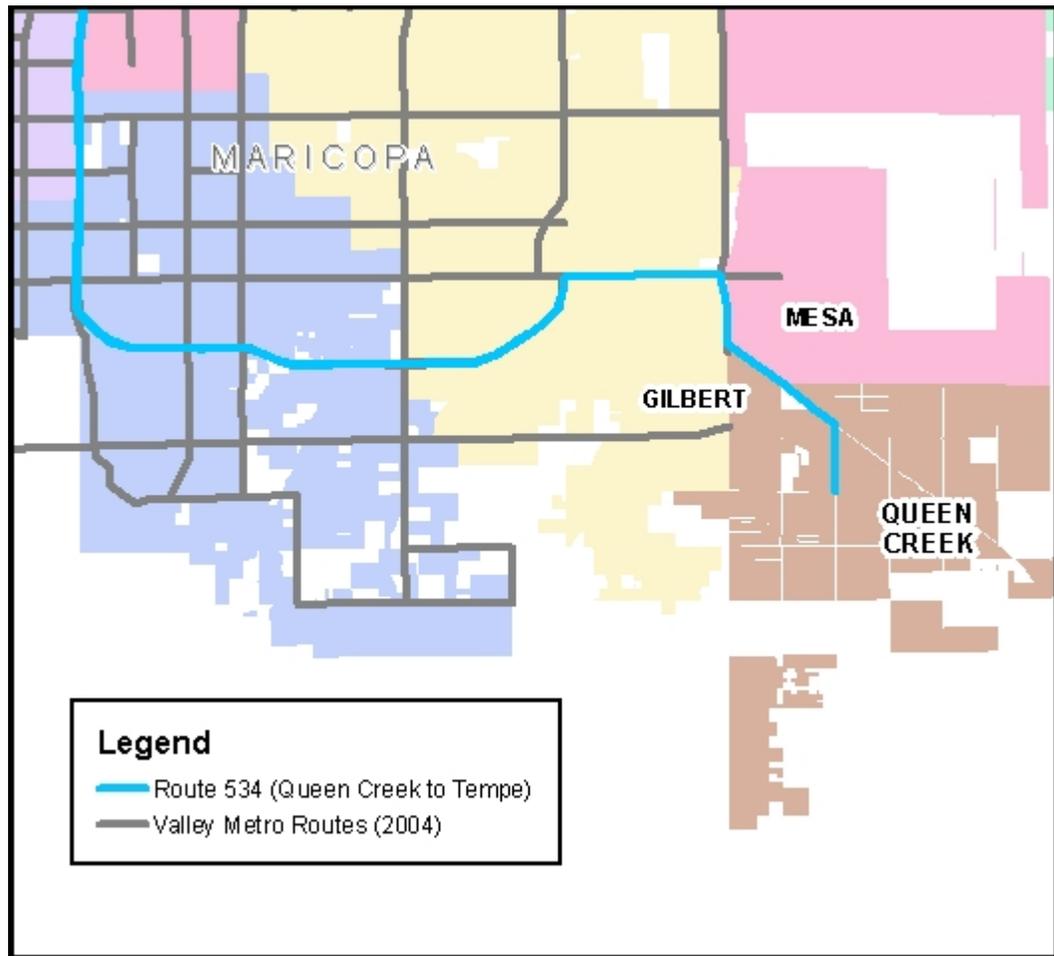
- The Santan Freeway (Loop 202), which was completed in 2007;
- U.S. 60, connecting eastern Arizona with the Phoenix metropolitan area; and

- SR 87, which is several miles away and is located in the Gila River Indian Community, making any future connection to the facility unlikely.

Public Transportation

Queen Creek joined Valley Metro in 2006 and implemented its first transit line in 2007, with an express bus route to Tempe (Route 534). An additional route to Chandler is expected in the fall of 2007. Figure 2.4 presents the existing transit system in and near Queen Creek.

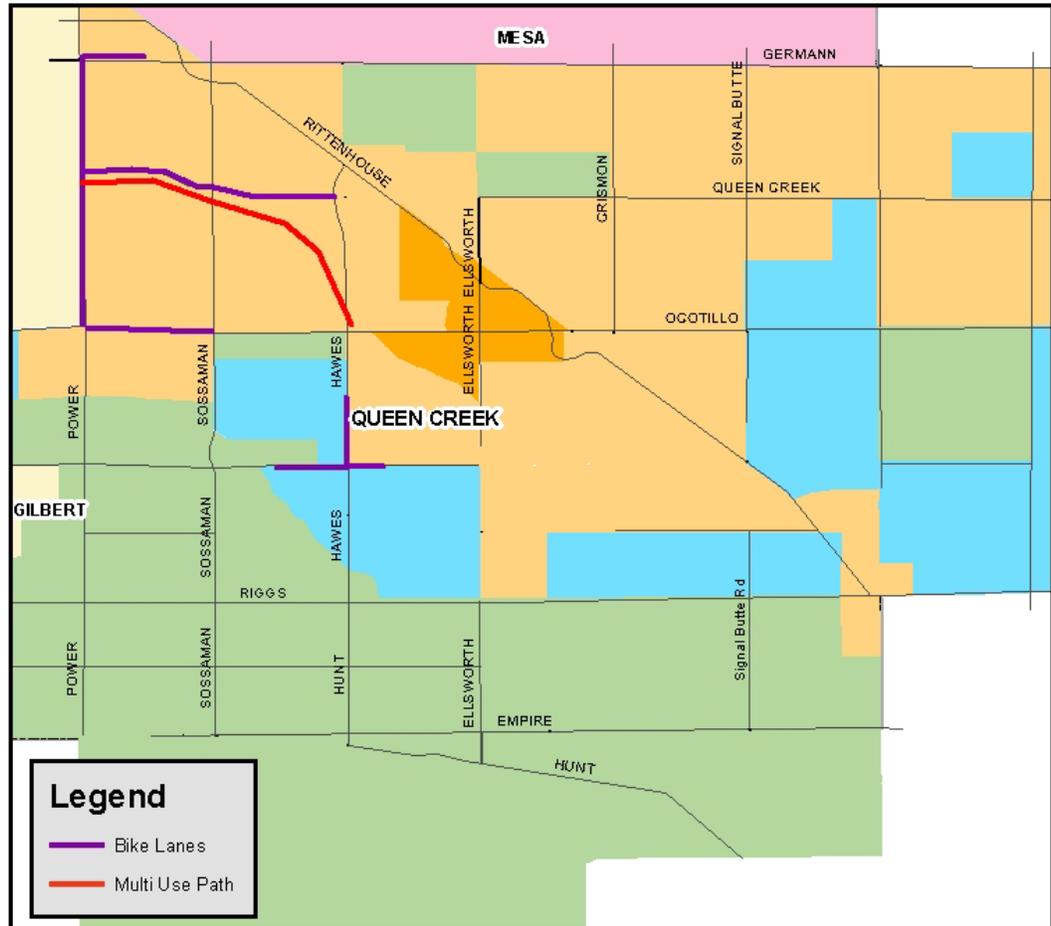
Figure 2.4 Existing Public Transportation System



Non-Motorized Transportation

At present, there are approximately 10 miles of bicycle lanes in Queen Creek distributed over various roads. These include striped lanes on Power and Queen Creek Roads and an off-road path (Figure 2.5).

Figure 2.5 Queen Creek Bicycle and Multiuse Trail Network



2.4 PROGRAMMED SYSTEM

In addition to identifying the current system, this report also identifies the likely future system. The analysis of future conditions includes all of the currently funded projects in the area. This section identifies these funded projects. The final section identifies projects that have been planned, but not funded.

Roadway System

The primary source of information for the programmed or funded roadway projects is the Queen Creek Transportation Improvement Program (TIP). The TIP includes the following key projects:

- Construction of a new Ellsworth Loop Road around the existing town center to separate through and local traffic;
- Rerouting some portions of Rittenhouse Road to eliminate some of the skewed angle intersections in the Town;

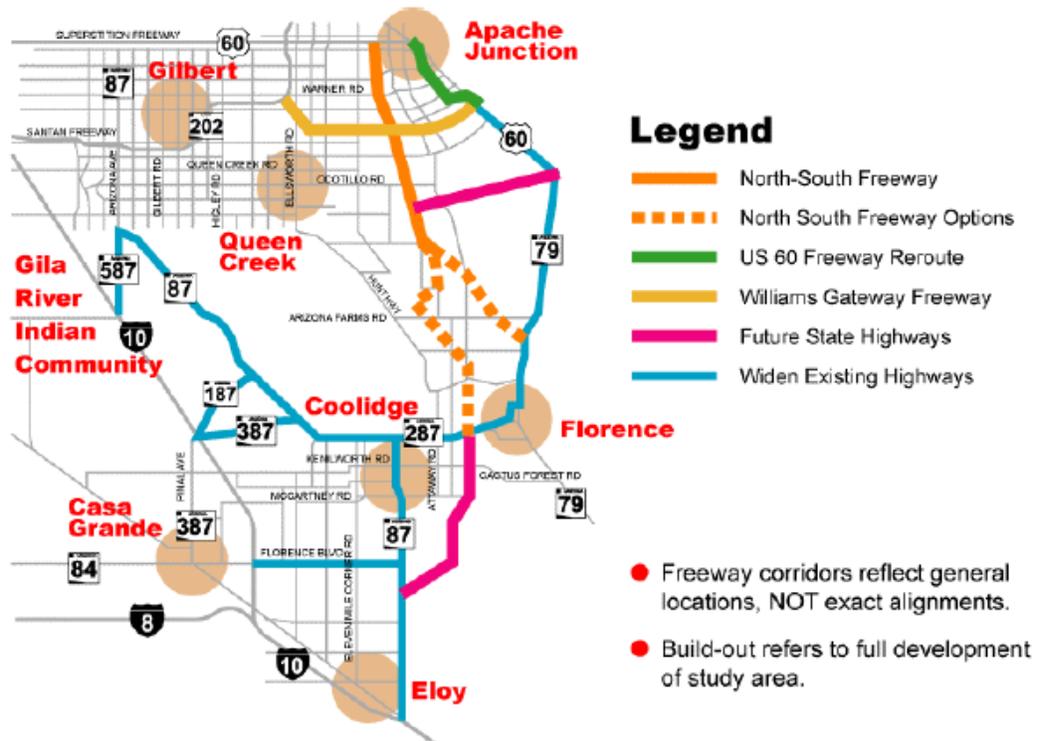
- Widening sections of major east-south and north-west arterials, including some developer-funded projects (a total of 47 street lane-miles); and
- Widening, adding turning lanes, and adding signals to 28 intersections;

In addition to these local projects, information from the MAG RTP, ADOT, and local jurisdictions was used to develop a complete picture of current regional investments. Major local and regional projects of note include:

- Completing and widening Maricopa County arterials in Queen Creek, including Riggs, Meridian, and Germann Roads;
- Widening and completion of arterials in Mesa and Gilbert; and
- New arterials and arterial improvements in Pinal County.

In addition, potential ADOT investments in the regional freeway system were included in the analysis, including the Williams Gateway Freeway, the North-South Freeway, and a reroute of U.S. 60 (Figure 2.6). The ADOT corridors represent general locations where potential future roadways may be located, but no funding has been identified for the purchase of right-of-way or construction. The actual alignments will be determined by future ADOT engineering studies.

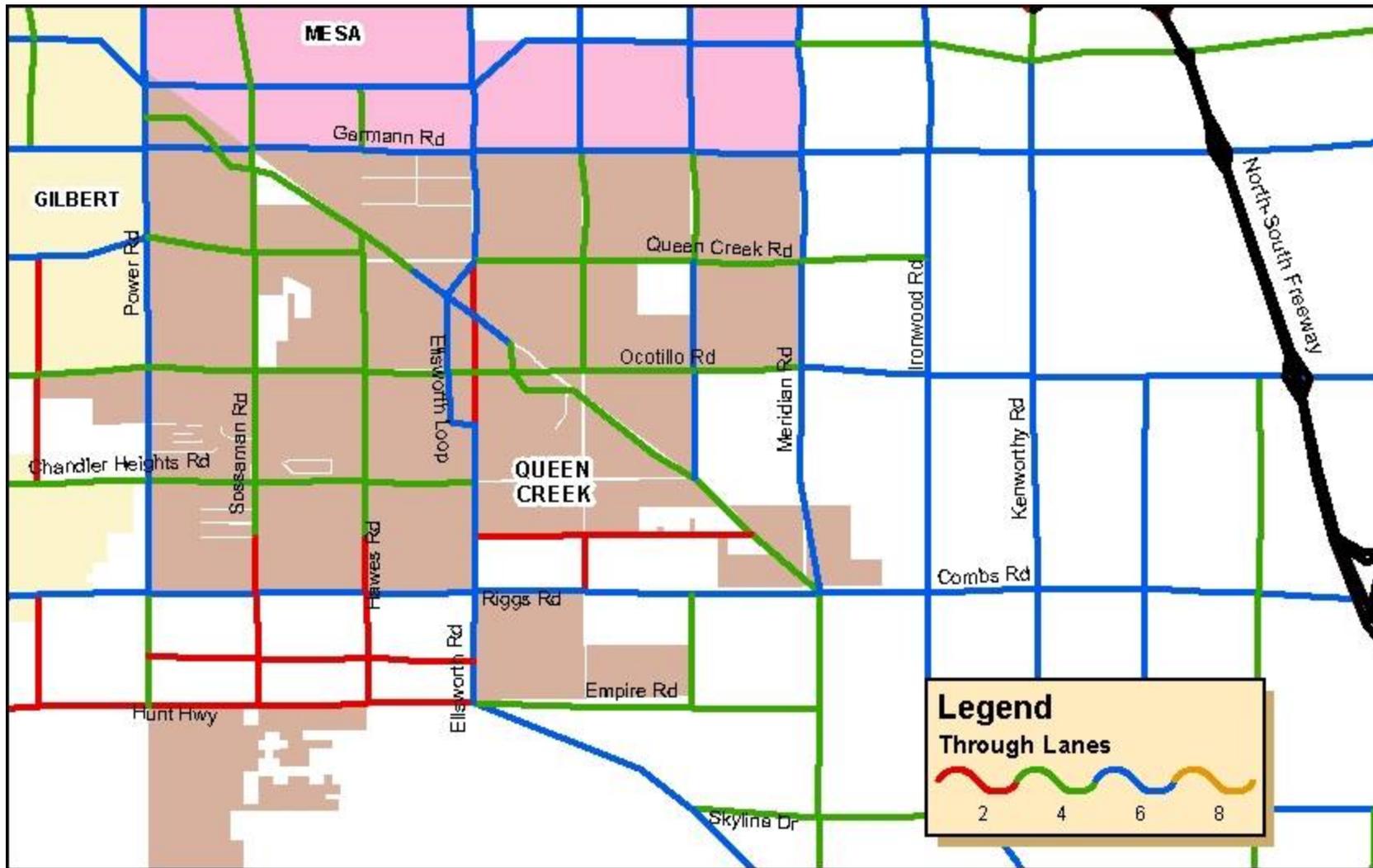
Figure 2.6 ADOT Defined Corridors



Source: Arizona Department of Transportation, 2006.

The resulting expected number of lanes in 2026 is shown in Figure 2.7.

Figure 2.7 Future Number of Lanes, 2026



Public Transportation

Queen Creek and Valley Metro have plans for a new route to Chandler starting in the fall of 2007. This will be the second route serving Queen Creek. In addition, the MAG RTP identifies a number of proposed bus routes that will be implemented in the surrounding area over the next 20 years, including the following:

- Extension of Route 156 to Williams Gateway Airport/ASU Polytechnic Campus in 2007;
- A new bus route along Power from McDowell Road to Rittenhouse Road, implemented in 2014;
- A new bus route along Ray Road from 40th Street to Williams Gateway Airport/ASU Polytechnic Campus in 2015;
- A new bus route along Queen Creek Road from Power to I-10, implemented in 2018;
- Freeway BRT to the Williams Gateway Airport, implemented in 2017; and
- Arterial BRT on Chandler Boulevard/Williams Field Road, implemented in 2023.

For the street network, several recent and ongoing plans provide potential future directions. Apache Junction finished a SATS several years ago and has identified new street network in northern Pinal County. Mesa is currently updating their transportation plan, and will have additional roadway investments that could impact Queen Creek. Gilbert recently completed an arterial system study. Finally, Pinal County recently developed a SATS that identified needed new county roads. This information was incorporated into the analysis conducted for the Queen Creek SATS.

Beyond the MAG RTP, public transportation planning includes two significant efforts: the MAG High Capacity Transit Study and the ongoing Commuter Rail Strategic Planning Study. This High Capacity Transit study recommended three new high capacity transit services:

- A new commuter rail line along the UP Southeast line with service to Queen Creek and Pinal County;
- A BRT corridor along Power Road; and
- A BRT corridor along Chandler Heights Road.

The Commuter Rail Strategic Planning Study will address funding and implementation phasing for the identified commuter rail corridors.

In addition to fixed-route transit, previous studies have also identified the need for paratransit service in the study area. The Southeast Maricopa/Northern Pinal County Area Transportation Study (SEMNPTS), undertaken in 2003,

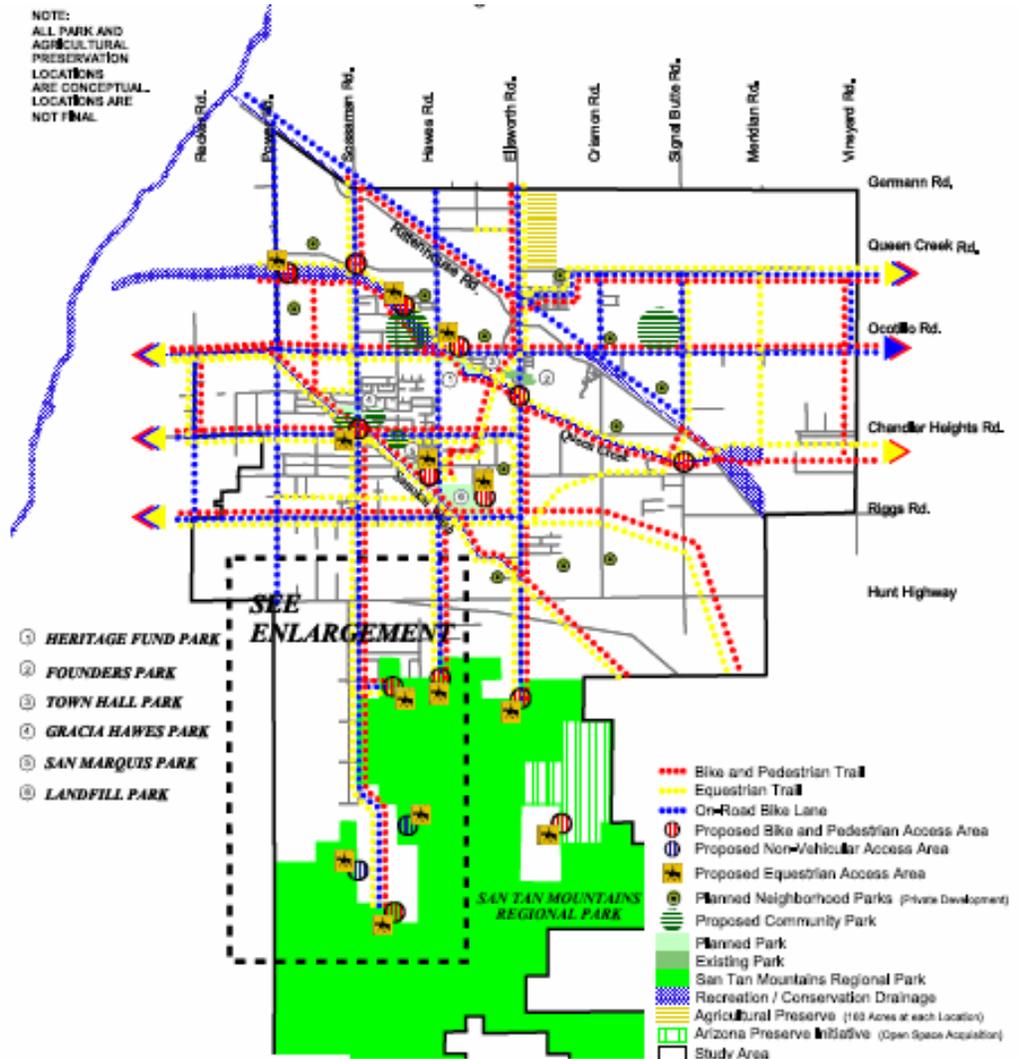
estimated that Queen Creek will require 15 hours per day of paratransit services to persons with disabilities and seniors. The Regional Public Transportation Agency (RPTA) has undertaken a regional paratransit study that will identify and evaluate potential regional service models for paratransit and Dial-a-Ride service. Output from this study could result in improved services for riders and more efficient service provision by paratransit providers.

Non-Motorized Transportation

Several documents have been produced to identify potential improvements to the non-motorized network. Recent studies that have identified bicycle system improvements include the Maricopa County Bicycle System Plan (1999, currently being updated); the Maricopa County Power Corridor Improvement Study (2000); the SEMNPTS; and the Queen Creek Trails and Open Space Plan. The Queen Creek Trails and Open Space Plan contains the most ambitious non-motorized network plan of the studies reviewed. Queen Creek's trail plan envisages bicycle, pedestrian, and equestrian trails on nearly every roadway in Queen Creek (Figure 2.8).

The ultimate purpose is to develop non-motorized facilities that connect to parks and open space areas within the Town and surrounding jurisdictions. This is in line with Maricopa and Pinal Counties' purposes of providing continuity of non-motorized facilities across municipal boundaries, linking recreational corridors around the Valley, and helping preserve open space in the community. The implementation of bicycle and pedestrian trails along Sossaman, Hawes, Ellsworth, and Rittenhouse Roads would improve north-south and east-west connectivity across jurisdictions, and would provide direct access to San Tan Mountain Regional Park.

Figure 2.8 Queen Creek Proposed Non-motorized Network



Source: Queen Creek General Plan, 2002.

2.5 CURRENT CONDITIONS

This section summarizes current and future system conditions for the transportation network in Queen Creek using traffic counts, volumes, LOS, and related information.

Existing Conditions

Several aspects of the condition of the roadway network are presented here, including traffic counts, intersection LOS, and traffic crashes. Current system conditions are based largely on actual observed traffic counts. Future conditions use modeled volumes, which are based on the validated MAG travel demand model.

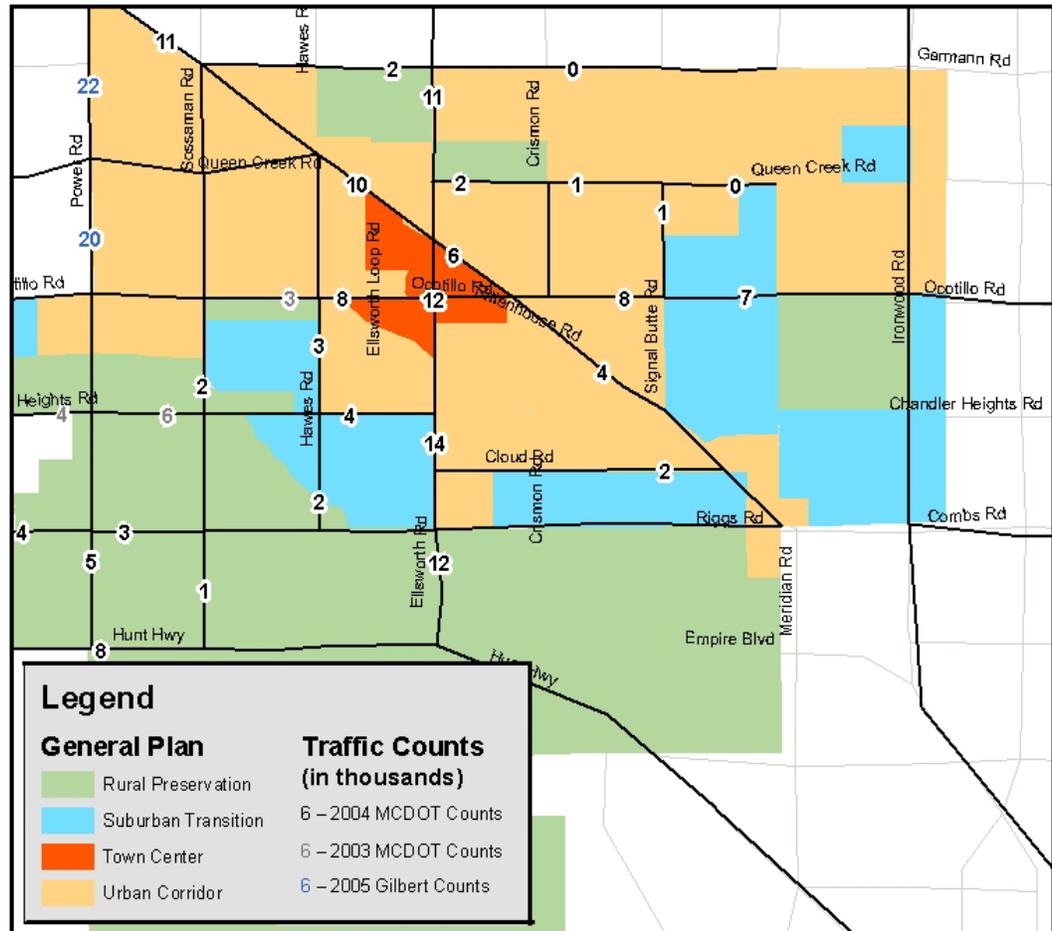
Traffic Counts

Queen Creek does not currently collect traffic counts on a systematic basis, but other jurisdictions and agencies, such as MCDOT, MAG, and the Cities of Gilbert and Mesa, collect regular traffic counts. The latest available traffic counts were gathered from MCDOT (2004 and 2003) and Gilbert (2005). Figure 2.9 presents the traffic counts for roads in and near the Town of Queen Creek.

The most significant traffic volumes are found on north-south roads, including Power, Ellsworth, and Rittenhouse Roads. These volumes reflect the tendency for movements both from and through Queen Creek to employment destinations elsewhere in the Phoenix metropolitan area. The most recent traffic counts on Ellsworth and Rittenhouse Roads range from 10,000 to 14,000 vehicles per day. On Power Road, volumes at the Queen Creek/Gilbert border are over 20,000 vehicles per day. The extent of traffic passing through Queen Creek can be seen most clearly on Ellsworth Road. Traffic volumes are consistently over 10,000 vehicles per day for the length of the road through Queen Creek. Notably, Ellsworth is also the road that provides the most direct access from Pinal County.

It is important to note that, though many of the volumes in Queen Creek are relatively low compared to other locations in the metropolitan area, they are causing substantial congestion on Queen Creek's road network; most of which is currently only two lanes.

Figure 2.9 Queen Creek Traffic Counts

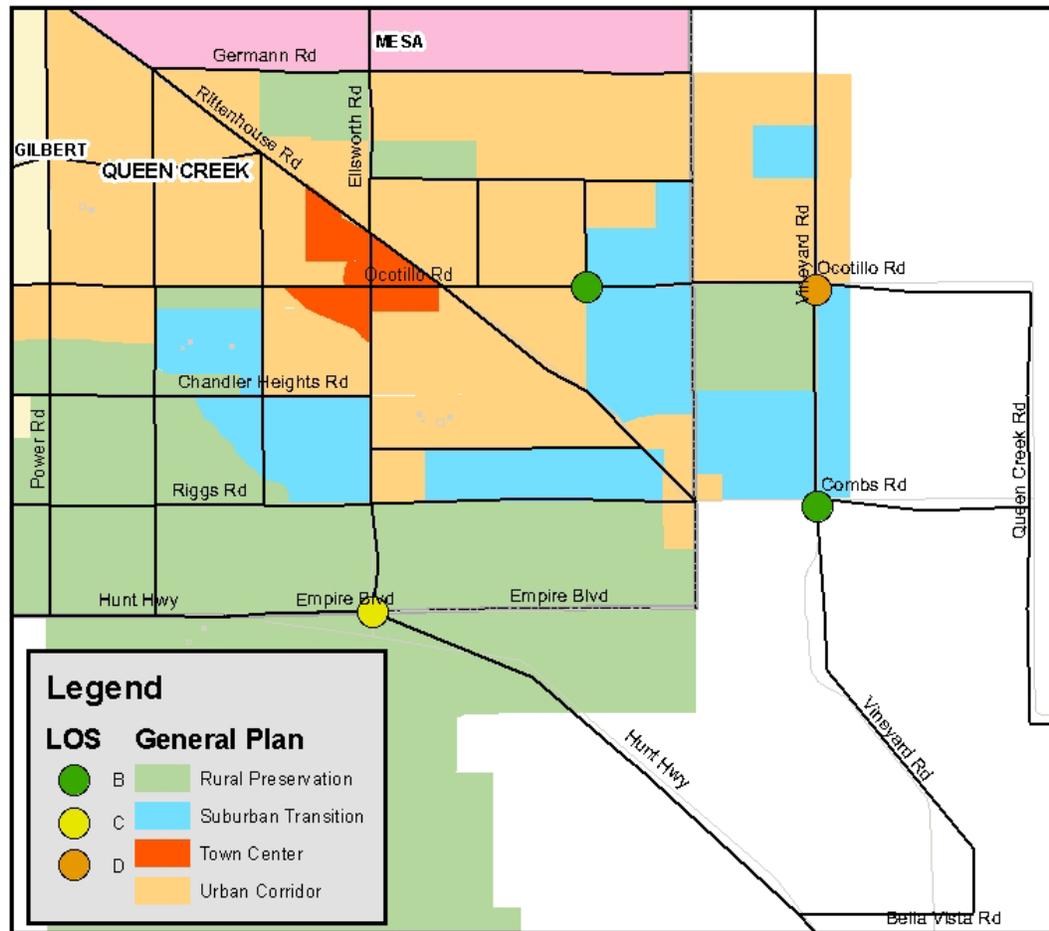


Sources: Maricopa County Department of Transportation, 2004 and 2003; and Gilbert, 2005.

Intersection Level of Service

As part of the modeling effort, MAG calculates intersection Level of Service (LOS) for every intersection in the MAG model. LOS is graded from A to F. Grades E and F represent severe congestion. Grade D represents congested conditions, and C shows intersections that are approaching congestion. LOS calculations for intersections within Queen Creek are shown in Figure 2.10. If no symbol is shown, the intersection is considered to be at LOS A in the current year. Notably, there were few intersections of concern in 2004. The intersection of Ellsworth and Empire Roads was at C, and Ocotillo and Ironwood Roads at D. Two additional intersections are at LOS B, but this is well with acceptable bounds.

Figure 2.10 Intersection LOS, 2004



Given the rapid increase in population from 2004 to 2007, current conditions may be somewhat worse than estimated for several intersections. One intersection of note is where Hunt Highway enters Queen Creek. This is the main connection point from the south into Queen Creek, and recently has shown substantial delays. Pinal County recently updated this intersection to improve traffic flow.

Traffic Crashes

Traffic crashes were identified within the Town of Queen Creek from accident records collected by the Motor Vehicle Division of ADOT. These records are based on traffic reports made by motorists and police officers, and inevitably do not include all crashes, as some go unreported.

Figure 2.11 presents the location of crashes within Queen Creek; and Table 2.2 presents the total number of crashes, injury crashes, and fatality crashes for each of the previous three years. Crashes have increased substantially in recent years as traffic has increased. However, the number of fatalities has remained low, averaging only one per year within the town limits.

Figure 2.11 Queen Creek Crash Locations, 2003 to 2005



Table 2.2 Traffic Crashes in Queen Creek, 2003 to 2005

| | 2003 | 2004 | 2005 | Average |
|------------------|------|------|------|---------|
| Total Crashes | 135 | 185 | 267 | 196 |
| Injury crashes | 48 | 79 | 82 | 70 |
| Fatality crashes | 2 | 0 | 1 | 1 |

Source: Arizona Department of Transportation, 2006.

Many of the highest incident locations are along Rittenhouse Road. The plan to realign this road to meet at right angles with the crossroads should provide a significant improvement in crashes by eliminating many of the angled intersections in Queen Creek. In addition, the Ellsworth Loop Road should reduce conflicts, especially between Rittenhouse and the existing Ellsworth Road by rerouting traffic.

The following remaining intersections that show relatively high numbers of crashes include:

- Power and Queen Creek Roads;
- Ocotillo and Signal Butte Roads;
- Rittenhouse and Hawes Roads;
- Hunt Highway and Ellsworth Road; and
- Germann and Ellsworth Roads.

These are among the highest volume roads and intersections in Queen Creek. Increased signalization and use of protected left-turn phases should help reduce incidents at these locations. Many of these intersections were not signalized in the period when data were collected. After Queen Creek implements its current Capital Improvement Program, which includes adding over 20 permanent signals and several temporary signals, additional analysis of intersections should be conducted to determine which intersections require additional attention.

In addition to examining the locations of crashes, crash data were also evaluated relative to vehicle miles of travel (VMT) to establish a crash rate. Overall, crash rates were consistent with the observed crash data. In general, the VMT on roadway links in the study area did not vary substantially in 2004. The two exceptions were at Sossaman and Germann, and at Ellsworth and Hunt Highway. These two intersections had lower crash rates than other intersections with similar total numbers of incidents.

Public Transportation

Fixed-route services in Queen Creek were added in 2007, and only preliminary ridership data are available for these services at the time of writing. For para-transit service, however, needs can be identified based on existing population counts. The potential transit-dependent population was estimated using current

population estimates from the Arizona DES and the 2000 Census. Table 2.3 presents the population over age 65, disabled, and either over age 65 or disabled for both Queen Creek and Maricopa County. Using 2005 population estimates for Queen Creek from the Arizona DES and assuming that the percentage of transit dependents remains the same, 1,920 people may need some paratransit services in Queen Creek. Notably, Maricopa County has a substantially higher proportion of residents over age 65 than Queen Creek (12 percent compared to 5 percent).

Table 2.3 Potential Paratransit Dependent Population

| | Queen Creek | | Maricopa County | |
|------------------------|-------------|---------|-----------------|---------|
| | Number | Percent | Number | Percent |
| Over age 65 | 217 | 7.8% | 351,120 | 11.4% |
| Disabled, Age 21 to 64 | 339 | 5.0% | 314,158 | 10.2% |
| Disabled, over age 65 | 75 | 1.7% | 134,454 | 4.4% |

Source: 2000 Census.

Note: Over age 65 or disabled category is not a sum of the two categories (i.e., over age 65 and disabled are not double counted).

Future Conditions

The future expected conditions of the transportation system are based primarily on results from the MAG model. Using the updated demographic data and network characteristics, model runs were generated to estimate future traffic volumes, intersection LOS, and other relevant information.

Two separate model runs were conducted for the base future year (2026) to account for varying estimates of the population of Pinal County: one using numbers from the Arizona DES and the other using numbers from the Pinal County SATS. The Maricopa County data, including Queen Creek, are the same for both model runs. The SATS model run has more than double the population for Pinal County than the Arizona DES run.

Volumes and Intersection LOS

Figures 2.12 and 2.13 show the future volumes and intersection LOS for the DES and SATS model runs, respectively. The planned investments can handle the expected traffic growth if Pinal County grows to around 800,000 (DES scenario). At 1.9 million (SATS scenario), however, over one-half of the intersections was expected to be at LOS E or F, representing substantial congestion within Queen Creek.

Figure 2.12 Future (2026) Volumes and Intersection LOS
DES Model Run



Figure 2.13 Future (2026) Volumes and Intersection LOS
SATS Model Run

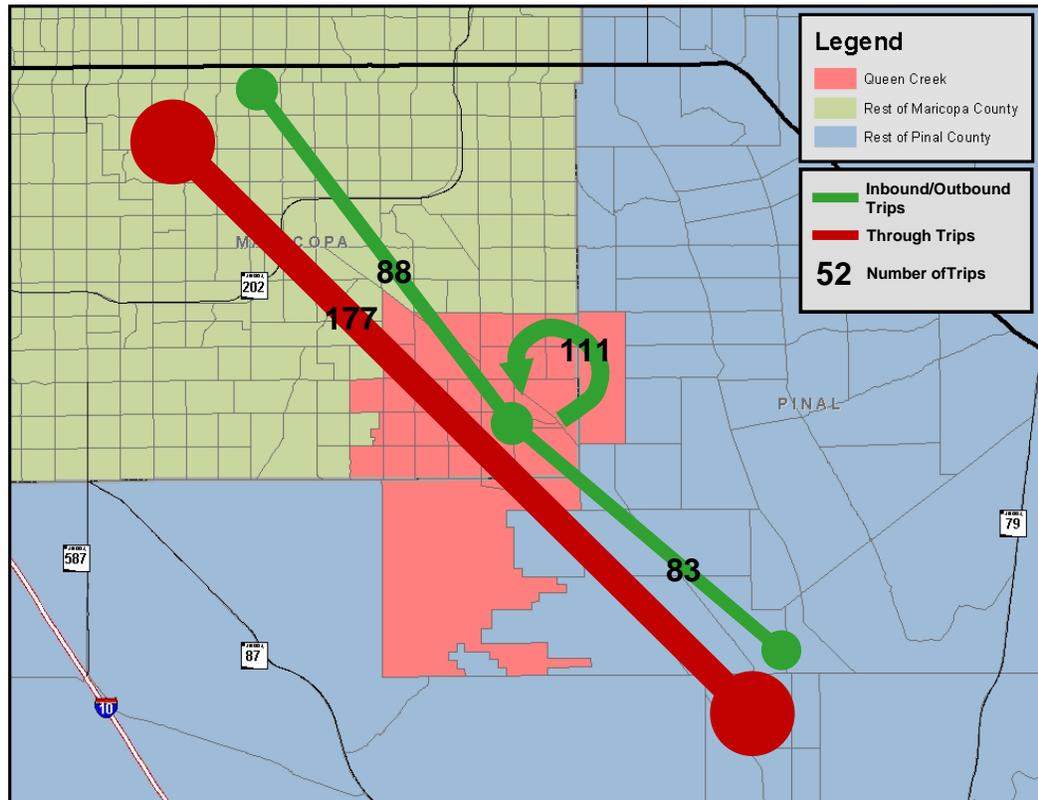


Travel Patterns

In addition to traffic volumes and transit ridership, an overview of travel patterns in the region help describe the root causes of traffic congestion in Queen Creek. Because of Queen Creek’s position in the Phoenix urban area, it is important to acknowledge the regional transportation needs in the SATS, in addition to the needs within the Town itself. In particular, it is useful to understand how much of the traffic in Queen Creek is a result of local travel, and how much is driven by development outside of the community.

Figure 2.14 presents a high-level summary of the expected travel patterns to, from, and through Queen Creek in 2026 using the Pinal SATS-based model results. The figure presents a rough estimate of the total number of daily trips (indicated by the thickness of the band) between Queen Creek and its various neighbors. Through trips are those likely to use Queen Creek’s roads for through trips, but congestion, individual preference, and other factors may mean that they will use a different route. The trips are aggregated to areas from zone-to-zone trip estimates generated by the MAG travel demand model.

Figure 2.14 Travel Patterns in the Queen Creek Area, 2026



Note: Based on Pinal SATS model run. Trips are thousands of daily trips.

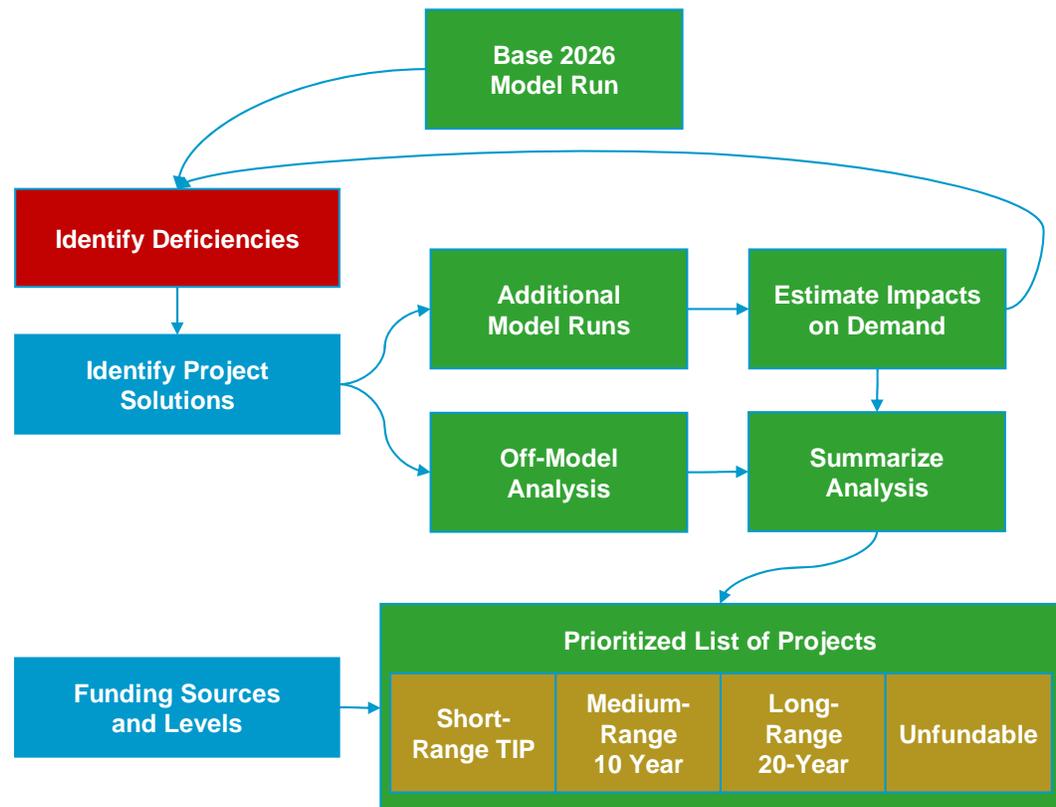
The most significant travel pattern in 2026 is expected to be through movements between Pinal and Maricopa Counties in a generally north-south direction (177,000 trips per day). It is important to note that this number does not represent the total number of trips between Pinal and Maricopa Counties, just the number that would be likely to pass through Queen Creek. Internal trips (111,000) represent the second largest movement. Internal trips are usually among the most significant when analyzing trip-making over a 24-hour period, as this includes trips of all types. Trips between Maricopa County and Queen Creek and Pinal County and Queen Creek are each over 80,000 trips per day. A small number of trips passes through in a more east-west direction.

3.0 Project Identification and Evaluation

3.1 EVALUATION METHODOLOGY

The evaluation methodology developed for the Queen Creek SATS is iterative in nature. It began with the initial evaluations identified in the current and future conditions analysis; identifies deficiencies and solutions; and evaluates these solutions using clear criteria, which, to the extent possible, have been quantified. Figure 3.1 presents a graphic overview of the process.

Figure 3.1 Methodology Overview



Performance Evaluation Criteria

A variety of tools and methods were employed to generate performance criteria for the proposed transportation projects in Queen Creek (Table 3.1). These criteria have been selected to balance the demand across the system and reduce the impact of congestion.

Table 3.1 Queen Creek SATS Evaluation Criteria

| | Description | Assessment Criteria |
|---------------------------|--|---|
| Traffic volumes or riders | Number of vehicles carried on Queen Creek Roads; number of riders | Traffic volumes should be decreased or shifted across the system to roads with available capacity. |
| Intersection LOS | Intersection LOS by grade (A, B, C, D, and E/F) | Number of intersections by grade and intersection-by-intersection evaluations. |
| General plan consistency | Supports designations of commercial and residential areas; supports open space plan; supports Town Center plan | Qualitative assessment by Queen Creek staff – Do planned roads support the town access and circulation in economic areas and reduce traffic conflicts in the Town Center? |
| System impact | Level of traffic in the Town as a whole | Change in average traffic volumes. |
| Cost effectiveness | Cost per vehicle or cost per rider | |

From these criteria, a hierarchy of considerations was identified to support the overall SATS evaluation:

- **Commercial development.** One of the top priorities to support the Town’s General Plan and Town Center Plan is to support commercial development in designated areas of the Town. Investments that support this development will help generate future funds for additional investments.
- **Connectivity.** A second consideration is for local investments. Do new investments help complete key gaps in the arterial system and allow Queen Creek residents to access destinations across the metropolitan area?
- **Through traffic.** A third consideration is for through traffic. As identified in the SATS, many of the issues facing Queen Creek relate to the massive residential growth expected in Pinal County. Although providing for this growth may seem to be a secondary consideration for Queen Creek, it is important to address these issues to allow for easy circulation and economic development in Queen Creek.

As projects were identified, they were ranked using this three-part hierarchy. Investments that support all three criteria were identified as the highest priority for the short term. Other projects were ranked based on their contribution to these goals. In addition, the relative expense of right-of-way, construction, and other factors was an important consideration. In the short term, implementing more cost-effective projects first can help address existing issues and provide additional time to address more expensive and complicated projects.

The project identification process was based on an analysis of potential project solutions from three key sources – state, regional, and local – for three modes – roadway, public transportation, and non-motorized. Table 3.2 provides a matrix of the types of projects considered in each category.

Table 3.2 Project Identification Matrix

| | Roadway | Public Transportation | Non-motorized |
|----------|---|--|--|
| State | <ul style="list-style-type: none"> New highway, such as the North-South Corridor | <ul style="list-style-type: none"> New 5310 (Elderly and Disabled) or 5311 (Rural Transit) programs | <ul style="list-style-type: none"> No state non-motorized system at this level |
| Regional | <ul style="list-style-type: none"> Potential new expressway to move vehicles in and around Queen Creek Identifying and expanding roads of regional significance | <ul style="list-style-type: none"> New commuter rail service along existing right-of-way New or expanded bus rapid transit service | <ul style="list-style-type: none"> Continued development of the regional trail system Continued development of the regional on-street bicycle system |
| Local | <ul style="list-style-type: none"> Widening or new arterials and collectors Installing additional traffic signals | <ul style="list-style-type: none"> Local circulator shuttle | <ul style="list-style-type: none"> Locally sponsored trail system, connecting to regional system Local on-street system |

Roadway Projects

Several model runs were conducted to evaluate potential new roadway investments, including the following:

- Local improvements.** Filling out the local roadway network to ensure a consistent number of lanes is available for travel in both east-west and north-south directions. Improve connections between Pinal and Maricopa Counties along major north-south connectors, such as Power Road, by widening Hunt Highway between the county line and Power Road and sections of Power Road that have fewer than four lanes.
- Expressway.** A new limited access corridor connecting the Williams Gateway Freeway to residential developments in northern Pinal County. This corridor could be constructed as an expressway, freeway, or potential toll road. The purpose would be to connect Queen Creek's major employment centers and residents in both Queen Creek and Pinal County to the regions freeway system without over-extending the local arterial system.
- Arterial Capacity.** Consider widening some east-west and/or north-south roads to eight lanes and providing improved access control (i.e., shifting property access to cross streets) in the future to enable both through and local traffic movements. Potential routes include Riggs, Ironwood, Ocotillo, Ellsworth, Power, and Germann Roads.

This initial set of model runs was conducted and evaluated to determine the relative benefits of the various solutions. The purpose of the model runs is to develop a general determination of additional needed capacity. The model output itself does not provide a final determination on the best network, and cannot capture all of the subtleties and complexities of the transportation planning process.

After reviewing this first set of model runs with the Technical Advisory Committee (TAC) – a group of stakeholders and partners that provided advice and information in support of the SATS – and Queen Creek staff, an additional model run was conducted to achieve the following three purposes:

1. The initial model runs were conceptual only and did not reflect limits on right-of-way and other constraints. Queen Creek staff provided a ‘build out’ maximum for each scenario that was evaluated.
2. For the expressway scenario, there were significant issues with the potential cost and the connection to the Williams Gateway Freeway. In the initial concept, the connection was identified just east of Ellsworth Loop Road. However, the proximity of this interchange to Ellsworth interchange and the connection of the Williams Gateway Freeway to Loop 202 made this infeasible.
3. It includes a proposed connection from Queen Creek Road to Germann Road at the northern border of Queen Creek. This extension has the potential to funnel some traffic from the southeast through the northern part of Queen Creek and into Mesa.

The **combined** model run included a modified expressway (connecting to the Williams Gateway Freeway at Meridian), a limited set of arterial improvements, widening of the Williams Gateway Freeway from Meridian to Loop 202, and the additional connector from Queen Creek Road to Germann Road just west of Hawes Road (Figure 3.2). This model run was not intended as a final analysis point, but does reflect the constraints that Queen Creek faces in building out the transportation network.

Figure 3.2 Combined Concept Number of Lanes, 2026



Transit Projects

Several transit projects were also evaluated, including the following:

- Potential commuter rail with a stop in Queen Creek;
- Extensions of existing fixed-route service (either BRT or regular bus) into Queen Creek; and
- Implementation of a Queen Creek circulator system.

Transit projects were evaluated using a combination of results from the MAG model and sketch planning analyses. MAG is conducting a Commuter Rail Strategic Plan jointly with ADOT. This study will provide much more detailed information about the feasibility of commuter rail, but it is not expected to be completed until the fall of 2007.

3.2 ROADWAY CAPACITY

Two key statistics were used from the MAG model to conduct initial evaluations of the model runs:

1. Predicted traffic volumes by roadway segment; and
2. Estimated intersection LOS for each intersection.

Table 3.3 presents a short summary of each model run. Table 3.4 presents an overall summary of the LOS of Queen Creek's intersections by model run. Figure 3.3 presents volumes and LOS for the combined model run.

Some of the key findings of the model runs include the following:

- The local improvements model run shows some improvements to intersections on Sossaman, Ellsworth, and Crismon Roads. Traffic increases on Hunt Highway and Power Road within Queen Creek, and some of these intersections show worsening LOS as a result of this shift. Overall, the small improvements in the west part of the study area help even traffic. There are limited changes on the east side of Queen Creek and continued severe congestion.
- The expressway model run predicts substantial volumes on the new expressway, as expected. The expressway would be congested, although only at the limited set of intersections that were included in the model run. The expressway provides some improvements to the east side of Town, but they are limited. The expressway also draws some traffic and improves LOS along parallel Pinal County arterials.
- The arterial capacity model run heavily loads Riggs/Combs and Ironwood Roads. There are some intersections with improved LOS on Signal Butte and Ellsworth Roads.

Table 3.3 Queen Creek SATS Model Runs

| Model Run | Description |
|-----------------------|--|
| Base Future | The model on which all others are based. It includes all funded roadway improvements. It also includes the ADOT Williams Gateway and North-South Freeways, though these have yet to be funded. |
| Local improvements | Minor additional capacity on arterials within Queen Creek primarily focused on fixing scalloped streets. |
| Expressway (original) | An expressway connecting to the Williams Gateway freeway near Ellsworth, running through Queen Creek along Ryan, and heading south around Meridian. |
| Arterial capacity | Additional north-south and east-west capacity on arterials, primarily on Ironwood and Riggs Roads. |
| Combined | A model run that address right-of-way constraints within Queen Creek, and includes an expressway from the Williams Gateway freeway running south on Meridian into Pinal County. |

Table 3.4 Number of Intersections by LOS and Model Run, 2026

| Model Run | Level of Service (Number of Intersections) | | | | Total |
|---------------------------|---|----|----|-----|-------|
| | A-B | C | D | E-F | |
| Base future | 2 | 9 | 11 | 27 | 51 |
| Local improvements | 1 | 8 | 16 | 25 | 51 |
| Expressway (original) | 1 | 16 | 13 | 21 | 52 |
| Arterial capacity | 1 | 13 | 16 | 19 | 51 |
| Combined (new expressway) | 2 | 13 | 13 | 25 | 54 |

Source: MAG Travel Demand Model Runs, Queen Creek SATS, 2006.

Note: The Expressway and Combined model runs have more intersections due to the addition of new facilities, including the expressway and the proposed Queen Creek-Germann connector.

Figure 3.3 Combined Model Volumes and LOS, 2026



- The combined model run again heavily loads the proposed expressway. The correction to Ocotillo (maximum four lanes instead of the six originally proposed) creates increased east-west congestion.

Over one-half of the intersections within Queen Creek's borders is expected to operate at LOS E or worse by 2026 in the base scenario, and three-quarters is expected to be at LOS D or worse. Each of the model runs provides some improvements, though all are partial. The original expressway and arterial capacity model runs have the greatest reductions in the number of congested intersections, but they still remain at or close to 40 percent. Most of the improvements are only a single LOS grade, moving from E or F to D.

Change in Volumes

Another consideration in the analysis was the change in traffic volumes exhibited from the base future model runs to each of the other model runs. Because of the high traffic volumes, it is difficult to see these changes in the original set of figures. This information helps identify the locations that are showing increased traffic - are the investments drawing even more trips into Queen Creek from Pinal County? Or are they shifting trips from one arterial to another and balancing the system overall? Figures 3.4 and 3.5 present the changes in volumes (blue is increase; brown is decrease) from the base future model run to the arterial capacity and combined model runs, respectively.

The following changes in volume are shown in the model runs:

- The arterial capacity model run (Figure 3.4) has a significant shifting effect from other arterials to Riggs/Combs and Ironwood. This is evident in both Queen Creek and Pinal County. Notably, the increased capacity on the Williams Gateway Freeway helps to draw traffic away from some of the arterials in Queen Creek. Because of the high levels of congestion, adding capacity to arterials can have a variety of intended and unintended impacts. For example, adding east-west capacity could potentially shift traffic from north-south arterials in Queen Creek to other parallel arterials elsewhere in Maricopa County.
- The combined model run (Figure 3.5) shows similar patterns of change, though not as significant as the arterial capacity model run. Meridian is expected to show significant volume increases. The model shows declining volumes for much of the western part of Queen Creek, except in the locations where capacity has been added to Hunt Highway and the ends of Power, Sossaman, and Hawes Roads. There continues to be traffic declines on many of the arterials in Pinal County as well.

Figure 3.4 Change in Volumes – Base Future to Arterial Capacity Model Run, 2026

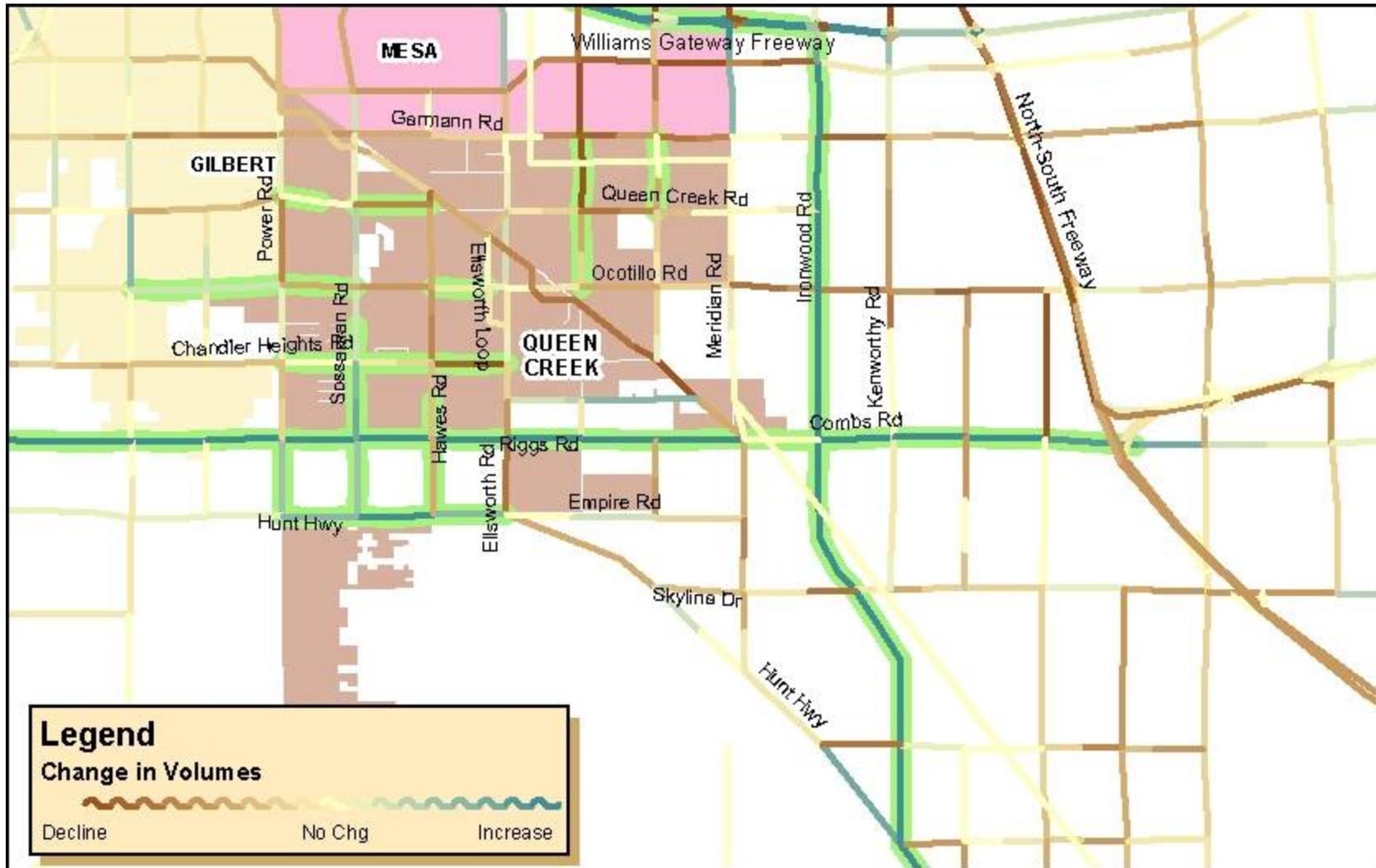
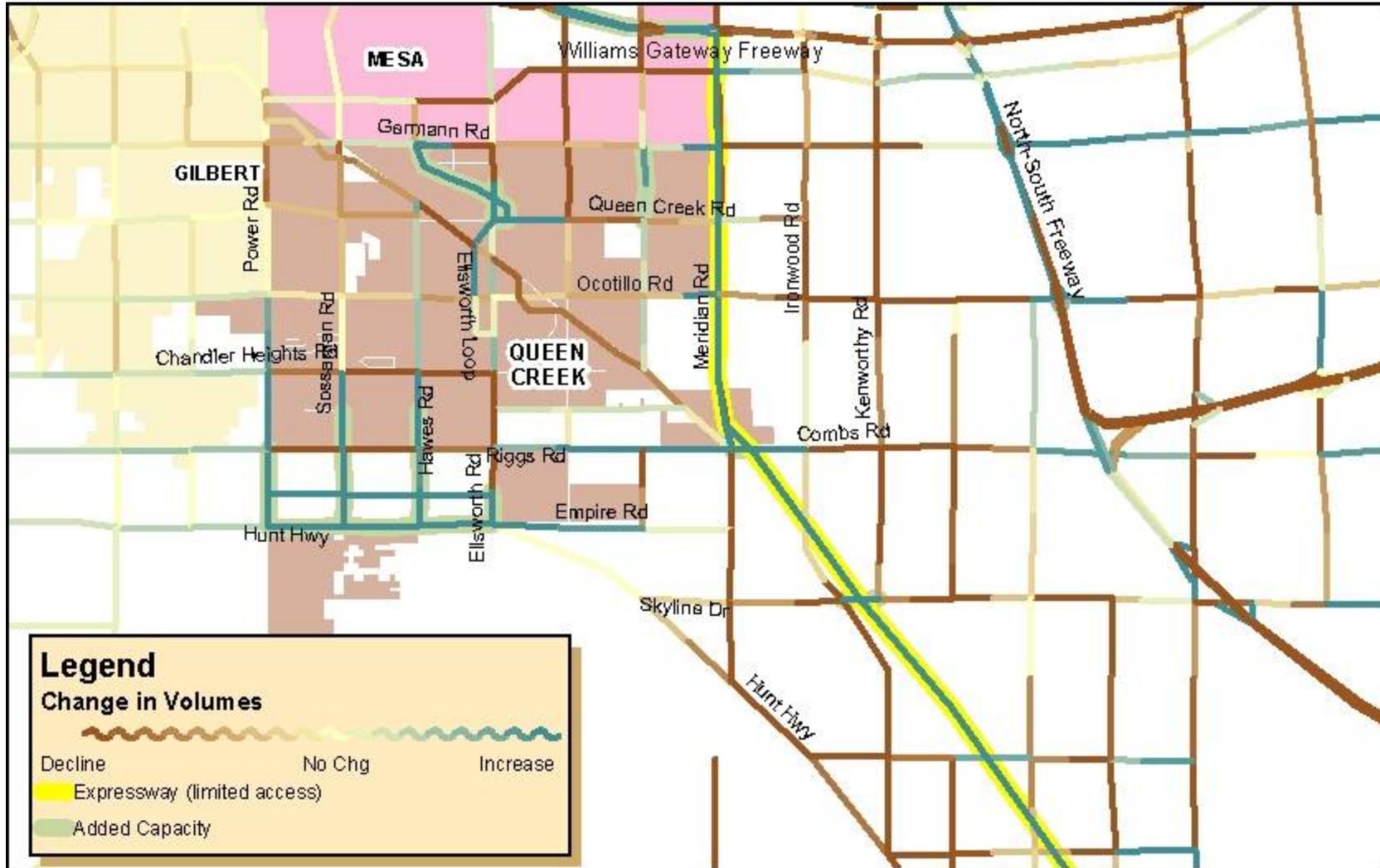


Figure 3.5 Change in Volumes – Base Future to Combined Improvements Model Run, 2026



3.3 ROADWAY MAINTENANCE AND PRESERVATION

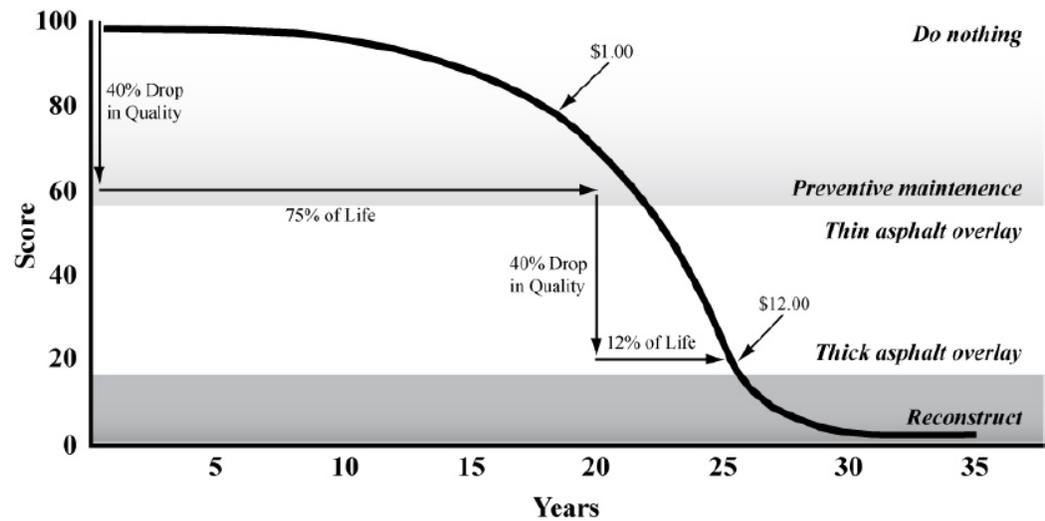
Up until recently, most of the roads in the Town of Queen Creek were owned by Maricopa County. As the Town has grown, more of these roads are coming under city responsibility and, as a result, will require increased investment in pavement preservation and maintenance. Many local agencies track the condition of their assets (typically pavement and bridges, but also signs, signals, and other assets); and predict future conditions using asset management models. Though it is well beyond the scope of the SATS to develop such a system for Queen Creek, the following provides some information that should help the Town analyze pavement resurfacing, rehabilitation, and reconstruction needs.

There are three basic categories of pavement preservation and maintenance that Queen Creek will consider as it develops a pavement preservation program:

1. **Routine Maintenance** is the day-to-day, regularly scheduled activities to prevent water from seeping into the surface, such as street sweeping, drainage clearing, gravel shoulder grading, and sealing cracks. This category also includes roads that are newly constructed or recently seal coated. They require little or no maintenance.
2. **Capital Preventive Maintenance (CPM)** is at the heart of asset management. It is the planned set of cost-effective treatments to an existing roadway that retards further deterioration, and maintains or improves the functional condition of the system without significantly increasing the structural capacity. The purpose of CPM fixes is to protect the pavement structure, slow the rate of deterioration, and/or correct pavement surface deficiencies. Roads in this category still show good structural support, but the surface is starting to deteriorate. CPM is intended to address pavement problems before the structural integrity of the pavement has been severely impacted.
3. **Structural Improvement** (PASER 1, 2, 3, and 4) is the category of roads requiring some type of repair to improve the structural integrity of the pavement. Pavements in this category exhibit deficiencies, such as rutting, large holes, alligator cracking, or joints and cracks that are badly spalled. Typical structural improvement activities include major rehabilitation or reconstruction.

Figure 3.6 presents the typical pavement life curve. Over time, increasingly expensive fixes are required. The pace of pavement degradation increases with time, so short-term expenditures on resurfacing can extend pavement life substantially and avoid or delay more costly reconstruction.

Figure 3.6 Typical Pavement Life Curve



Source: Maricopa County Department of Transportation, 2006.

Assessing asset condition requires several steps, starting with accurate inventory and condition data. The condition data that is collected should support performance measures of pavement condition, such as remaining service life (RSL) or others. Condition data are typically collected every one or two years using windshield surveys and/or vehicles equipped with automated sensing and recording equipment. These data are then fed into predictive models to help identify future conditions and to select potential improvements.

Queen Creek has many newly constructed or paved roads. Although these roads will not need significant treatments for the first several years, as time passes, it will become increasingly important to provide preventative maintenance to extend the life of the pavement asset.

3.4 TRANSIT

Local Circulator

One of the transit concepts that has been considered for Queen Creek is a local shuttle that is similar to the Ahwatukee Local EXplorer (ALEX). Started in 2002, the ALEX is a free local neighborhood bus circulator that follows a 40-mile route and provides service to schools, shopping centers, a senior center, parks, and a public library. Average weekly ridership on the ALEX shuttle is around 1,000 passengers per week.

ALEX serves a roughly 30-square mile area with approximately 72,000 residents and 31,000 jobs. This area is similar in size to Queen Creek, but with over four times as many residents. Given the expected rate of growth in Queen Creek, a similar shuttle service may be appropriate by 2020. However, ALEX has several features that help contribute to its success: significant community

involvement on its planning, flexible stops, and two dedicated populations (students and the elderly) that have relatively limited mobility options.

Total capital costs for the ALEX line are primarily for vehicle acquisition. New buses average around \$35,000 and annual operating costs are around \$750,000 for the line. This equates to roughly \$2.00 in operating cost per passenger trip, which is slightly less than average transit lines.

Fixed and Express Bus Service

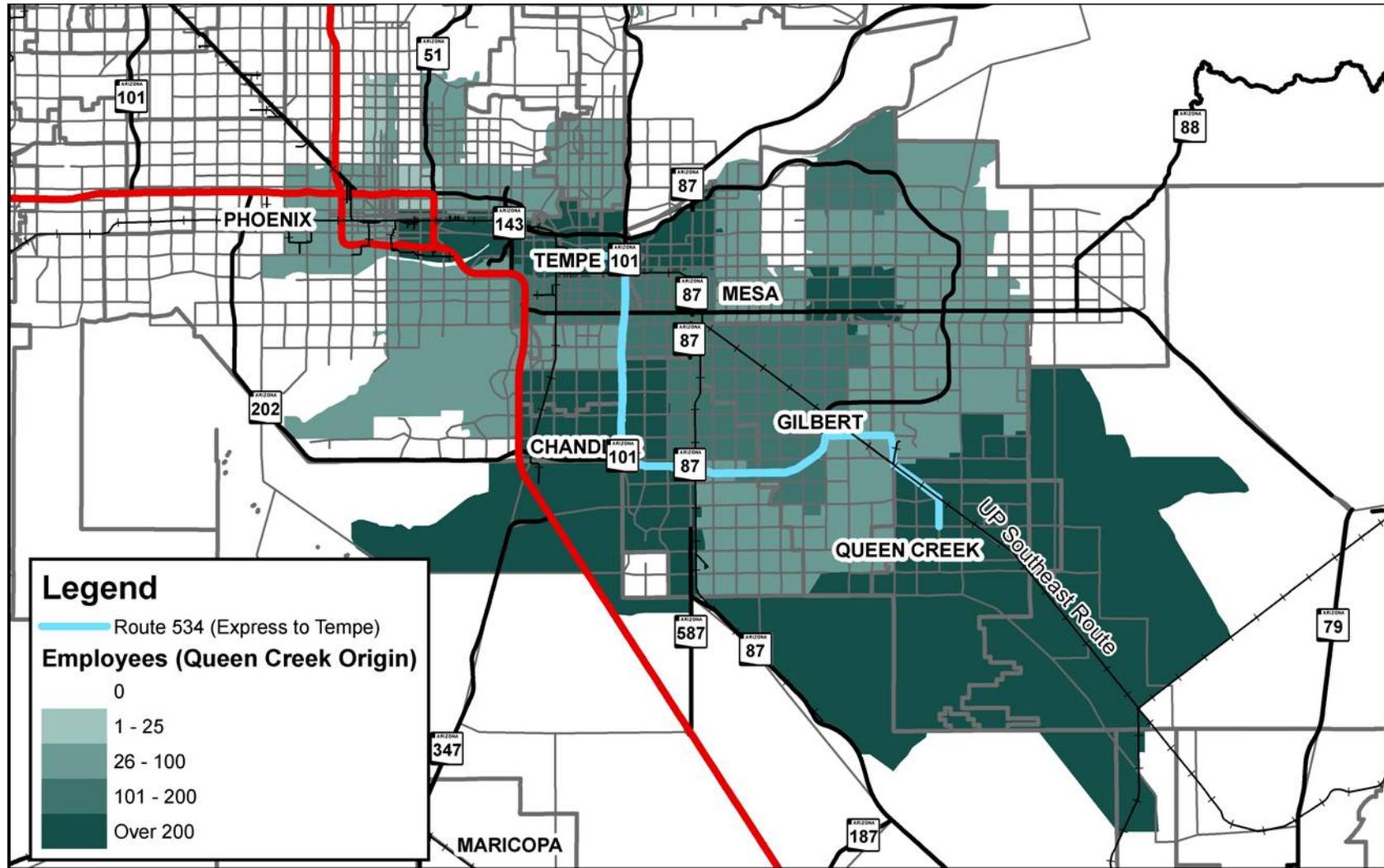
Queen Creek recently joined Valley Metro and initial service to Tempe (Route 534) has begun. The Town is working with Valley Metro to identify the appropriate set of destinations for future service. Table 3.5 and Figure 3.7 present the major destinations from Queen Creek (Zip Code 85242) and the surrounding area (Zip Code 85243) for commuters from a survey of commuters.

Table 3.5 Commuters from the Queen Creek Area to Major Destinations

| Area | Zip Code 85242 | Zip Code 85243 | Total |
|-------------------------|----------------|----------------|-------|
| Tempe (ASU/Sky Harbor) | 848 | 43 | 891 |
| Chandler | 990 | 58 | 1,048 |
| Downtown Phoenix | 135 | 11 | 146 |
| Mesa (U.S. 60 corridor) | 969 | 42 | 1,011 |
| Williams Gateway | 86 | 12 | 98 |
| Queen Creek | 430 | 30 | 460 |
| Other | 1,165 | 72 | 1,237 |

Source: Valley Metro Commuter Survey, 2006.

Figure 3.7 Destinations for Queen Creek Commuters, 2006



Commuter Rail

Commuter rail is currently being evaluated as part of the MAG Commuter Rail Strategic Plan; the first phase of which is expected to be completed in the fall of 2007. This study is examining commuter rail in several corridors, including the Southeast. This study will identify critical implementation issues for commuter rail, including environmental, safety, ownership, liability, and funding. The first phase will not rank individual commuter rail corridors, but will identify overall feasibility. More detailed technical evaluations, including ridership forecasts, will be completed in future phases. As such, ridership estimates for commuter rail lines will not be produced until 2008.

The MAG High Capacity Transit Study previously evaluated commuter rail along the UP Southeast line with a terminal in Queen Creek. The High Capacity Transit Study used a three-mile catchment area to identify the potential population served. A basic sketch plan was identified for two stations beyond the Queen Creek terminal identified in the High Capacity Transit Study. Table 3.6 identifies the population within three miles of the Queen Creek station and two additional stations in Pinal County. Ridership for the additional two stations was generated by estimating the ratio of ridership from the High Capacity Transit Study to the catchment area population.

Table 3.6 Population Served and Ridership for Proposed Commuter Rail Line, 2026

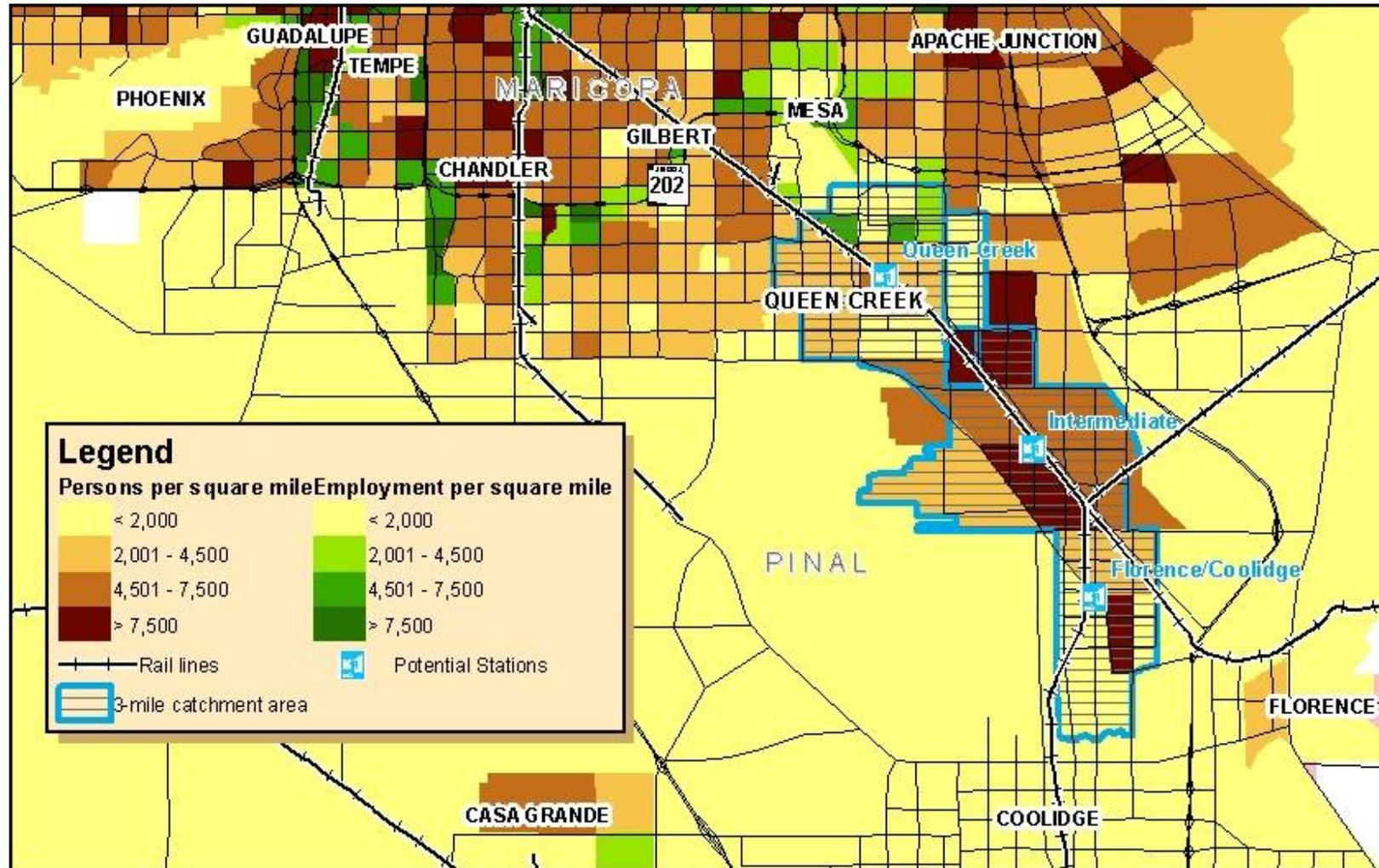
| Station | Population in Catchment Area | Estimated Daily Boardings |
|-------------------|------------------------------|---------------------------|
| Queen Creek | 163,633 | 941 |
| Intermediate | 271,030 | 1,559 |
| Florence/Coolidge | 82,977 | 477 |

Source: MAG High Capacity Transit Study, 2003.

Note: Projected boardings are a function of the amount of service assumed in the analysis. The boardings show AM trips in the peak direction and do not include reverse commute, off-peak, or PM trips.

Figure 3.8 identifies the stations and presents population and employment densities and catchment areas. Using a three-mile catchment area is somewhat limited; the Commuter Rail Study will likely identify true market areas, and will use an updated MAG travel demand model to estimate ridership. Until that time, this analysis provides a rough estimate of potential ridership. The two additional stations would add significant ridership to the commuter rail line, but given overall traffic volumes, the commuter rail line will do little to reduce congestion in Queen Creek.

Figure 3.8 Commuter Rail Station Potential, 2026



Note: The employment density shows only if greater than population density. The catchment area includes all TAZs that are at least partly within 3 miles of the stations. The commuter rail lines would be developed using existing trackage. The southeast line is owned by UP.

4.0 Public Involvement

The public involvement effort for the Queen Creek SATS was conducted over two rounds. The first round was conducted in conjunction with the identification of current and future conditions; and the second round in conjunction with the evaluation of alternatives.

4.1 ROUND I

The first round of public involvement took place in July 2006, and focused on the results of the current and future conditions analysis. The following events were included in this process:

- A presentation to the Queen Creek Town Council;
- A presentation and information gathering session with elected officials and key transportation stakeholders from Queen Creek and the surrounding jurisdictions; and
- A public open house that provided an overview of the study, presented key findings from the current and future conditions analysis, and provided an opportunity for members of the public to interact one-on-one with the project team.

Presentations

The presentations given at each of the events were fairly similar. Each presentation provided an overview of the study and highlighted key points from the current and future conditions analysis. The key points addressed by the presentation include:

- **The purpose of the study.** To identify the local transportation improvements needed to support the long-term development of the Town of Queen Creek and to address regional transportation issues in the Queen Creek area;
- **Open house summary.** Time, date, location, and purpose;
- **Demographic overview.** Population and employment growth in the Town of Queen Creek and Maricopa and Pinal Counties;
- **Current and future roadway system conditions.** LOS, numbers of lanes, and other relevant information; and
- **Overview of public transportation in Queen Creek.** Existing and future proposed systems.

Open House

Over 20 Queen Creek residents attended the public open house held on July 18, 2006. The open house was held in the evening and included a formal presentation and an informal opportunity to discuss the study findings with the project team, including both Town and consultant staff.

Several key questions were raised and discussed during the open house, including:

- Participants asked why so much traffic is anticipated to come to Queen Creek.
- The project team explained that much of the traffic was a result of substantial growth expected within Pinal County.
- Some participants noted that the residential and commercial development time line from SATS to construction is 10 to 20 years. They were concerned about today's traffic issues.
- The project team noted that there are a number of projects ongoing as part of Queen Creek TIP that will help relieve traffic congestion today. These include the Ellsworth Loop Road and a number of widening projects being funded by both the city and developers.
- Participants expressed concerns that a number of studies are being conducted, but that they may not lead to tangible results.
- The project team noted that there are several roadway projects under construction or design within Queen Creek. In addition, some of the larger issues are being studied in light of new proposed freeways, commuter rail, and rapid growth in Pinal County. Planning studies need to be updated regularly to be able to provide useful information to identify the projects that need to be constructed in the future.
- Participants asked if the proposed Williams Gateway Freeway alignment could be moved further south.
- The project team explained that MAG had conducted a detailed study and recommended an alignment for the proposed Williams Gateway Freeway. This recommendation was transmitted to ADOT, who will consider this and one or two other potential alignments in an engineering and environmental study over the next few years. It is possible that the alignment will shift at that time. This future design study will likely also include a public involvement component that will allow residents to express their concerns.
- Participants wanted to know if it was possible to speed up the construction of the Williams Gateway Freeway.
- The project team noted that MAG and ADOT have been looking into accelerating parts of the program. However, construction materials and labor are at a premium right now, increasing the costs of building more now.

- Participants noted that Pinal County is contributing substantially to traffic congestion in Queen Creek.

4.2 ROUND II

The second round of public involvement took place in February 2007, and focused on the results of the project evaluation and prioritization.

Presentations

The presentation given at the second open house provided an overview of the study and highlighted the strategic priorities identified as part of the SATS. The key points addressed by the presentation include:

- **The purpose of the study.** To identify the local transportation improvements needed to support the long-term development of the Town of Queen Creek and to address regional transportation issues in the Queen Creek area;
- **Open house summary.** Time, date, location, and purpose;
- **Future transportation issues.** A review of the impacts of population and employment growth on future transportation conditions in the Town of Queen Creek; and
- **Solutions.** Potential roadway and transit solutions, including high capacity roadways, local arterials, new transit services, and others.

Open House

Eight Queen Creek residents attended the public open house held on February 15, 2007. The open house was held in the evening and included a formal presentation and an informal opportunity to discuss the study findings with the project team, including both Town and consultant staff. Boards were also provided.

5.0 Program of Projects

This section summarizes the future prioritizes for the Town of Queen Creek, based on the work conducted for the SATS. It begins with a summary of available funding expected over the next 20 years, and provides key priorities by transportation mode.

5.1 FUNDING SOURCES

Revenue forecasts were identified for state and local funding available to Queen Creek. State sources of future revenue include the Arizona Highway User Revenue Fund (HURF) and the Local Transportation Assistance Fund (LTAF) I and II. Local sources include development fees and the recent established construction sales tax.

Based on the revenue forecasts, around \$60 million will be available over the short term (2007 to 2010), nearly \$150 million between 2011 to 2020, and over \$45 million from 2021 to 2026 (Table 5.1). The sales tax and HURF are the major two sources of revenue for transportation projects within Queen Creek. This table does not reflect any contributions from other sources, such as developers, that will also be available to help program transportation projects. These projects are usually tied to a specific development, so they are not estimated here.

Table 5.1 Summary of Estimated Funding Sources
2006 Dollars in Millions

| | 2007-2010 | 2011-2020 | 2021-2026 |
|-----------------|-------------|--------------|-------------|
| Local | | | |
| Development fee | 2.5 | 1.4 | 1.0 |
| Sales tax | 54.1 | 119.8 | 21.3 |
| State | | | |
| HURF | 5.0 | 21.2 | 23.7 |
| LTAF I | 0.3 | 0.8 | 0.6 |
| LTAF II | 0.2 | 0.4 | 0.2 |
| Total | 62.0 | 147.6 | 46.7 |

5.2 ROADWAY PRIORITIES

Projects have been identified from several sources for future prioritization, including the existing Queen Creek's TIP, the Maricopa County Department of

Transportation (MCDOT) TIP, assumptions made as part of the MAG model, and the analysis conducted for Queen Creek.

Three key factors were considered to establish the priorities, including the following:

- **Commercial development.** One of the top priorities to support the Town's General Plan and Town Center Plan is to support commercial development in designated areas of the Town.
- **Connectivity.** A second consideration is for local investments. Do new investments help complete key gaps in the arterial system and allow Queen Creek residents to access destinations across the metropolitan area?
- **Through traffic.** A third consideration is for through traffic. As identified in the SATS, many of the issues facing Queen Creek relate to the massive residential growth expected in Pinal County. Although providing for this growth may seem to be a secondary consideration for Queen Creek, it is important to address these issues to allow for easy circulation and economic development in Queen Creek.

In addition, safety and cost effectiveness were considered in the evaluation. For safety, potential investments took into account existing high crash locations. These are likely to change significantly in the future as the Town continues to develop. For cost effectiveness, the relative expense of right-of-way, construction, and other factors was considered. In the short term, implementing more cost-effective projects first can help address existing issues and provide additional time to address more expensive and complicated projects.

Using these criteria, four general categories of roadway investments have been identified. These reflect a combination of priorities, timing, and the appropriate agency to take the lead.

Short Term

Primary Routes

These are key routes that serve a combination of local, commercial, and through traffic. Advancing capacity expansion projects (new lanes and signals) on these routes is the Town's top priority. These projects will help promote orderly development, attract businesses and customers to commercial centers, and allow for the through movement of people. The following are the top three roadway segments:

1. **Ellsworth** from the Pinal County border to Mesa. This is the primary north-south route through Queen Creek and provides access to the core business area of Queen Creek. The project includes completing the Ellsworth Loop Road, redeveloping Ellsworth downtown to support the Town Center Plan, and widening the segments of Ellsworth to the north and south of the Loop Road to four through lanes with a long-term plan for six through lanes.

2. **Rittenhouse** from the Mesa/Gilbert border to Ocotillo, just southeast of downtown. Rittenhouse is another key route for through movements and also provide access to downtown Queen Creek. The project includes completing planned rerouting of Rittenhouse at Germann and Ocotillo Roads and widening Rittenhouse to four lanes. Due to limited access, the portion of Rittenhouse southeast of Ocotillo is not included as a primary route, but there are some interim fixes for Rittenhouse (see below).
3. **Ocotillo** from Hawes to Meridian. Ocotillo is one of the only east-west routes crossing the width of Queen Creek. With development occurring in Pinal County, Ocotillo Road provides access to shopping in downtown Queen Creek. Because of discontinuities on Ocotillo within Gilbert, segments west of Hawes are lower priority.

Interim Fixes

A second set of arterials was identified as needing interim fixes in the short term that can delay more significant improvements. The interim fixes include spot widening, new signals, protected left-turn lanes and signals, and other similar fixes that can be implemented at relatively low cost. All of the routes in this category will have additional improvements made in the long term. The specific segments for short-term interim fixes include:

- **Rittenhouse** from Ocotillo to Riggs/Combs. There are limited access points to Rittenhouse Road because of the railroad tracks on one side and development on the other. As a result, interim fixes including turn lanes can provide enough capacity in the short term for this segment of Rittenhouse. Long term, this road will be widened to four lanes, consistent with the ultimate goal of providing connections to downtown Queen Creek.
- **Chandler Heights** from Ellsworth to Power. The MCDOT has identified Riggs as an east-west road of regional significance, connecting all the way from I-10 to Pinal County, where it becomes Riggs Road. However, in Queen Creek, there are significant issues with right-of-way acquisition that will push development of Riggs out for several years. Chandler Heights provides a short-term alternative to support some east-west movement, especially for through movements from Pinal County to the south.
- **Sossaman** from Chandler Heights to Germann. Interim fixes on Sossaman will help to open up another north-south route for connection to the larger metropolitan area.

Medium Term to Long Term

Secondary Roads

In addition to the primary roads and interim fixes identified for the short term, there are a set of planned projects to complete the existing arterial network and expand it using information from the Queen Creek SATS. Many of these are

existing projects within the Queen Creek TIP that will likely have to be postponed due to increasing construction and right-of-way costs. These projects will have to compete with additional needs identified as part of the SATS, and will likely come up for consideration starting in 2010 and beyond.

Perimeter Roads

In addition to the completion of the arterial system, there are several roads with regional significance that have to be addressed separately. Queen Creek's location between Maricopa and Pinal Counties creates significant through movements within the Town. One of the key strategies to accommodate this travel is through improved perimeter routes. Many pieces of the arterial system are currently missing. The roads identified in this section have a primary focus of carrying through traffic, though they would naturally also carry local traffic. These roads require development over the long term, in conjunction with residential development in Pinal County. Complete development of these routes will fall at least partly under the purview of other agencies, especially MCDOT. The key perimeter projects include the following:

- **Meridian** from Riggs to Germann. Queen Creek is pursuing several potential opportunities in this corridor, including a new arterial, a regional super street, or some type of access-limited facility. More information is provided below on the need for new high capacity roads. Development of this road requires completion of the segment within Mesa from the Williams Gateway Freeway to Germann and a potential southeast extension of this route into Pinal County, depending on the particular form it takes.
- **Germann** from Sossaman to Meridian. Power is currently a two-lane road along the northern border of Queen Creek and another county road of regional significance.
- **Riggs** from Meridian to Power, including widening the existing segment from Power to Ellsworth to six lanes and constructing a new six-lane segment from Ellsworth to Meridian. As noted above, this is a road of regional significance connecting and one of very few that connect I-10 through to Pinal County.

Summary

Figure 5.1 identifies the priorities established for roadway projects in Queen Creek. Table 5.2 presents a matrix with potential long-term roadway investments. The matrix includes projects that fall under the jurisdiction of Queen Creek, as well as other agencies. The table provides a qualitative assessment of the key impacts to traffic volumes and LOS (from Section 3.0) and an overall priority ranking of low, medium, and high. Many of the projects in the table are broken into individual segments to reflect the participation of various agencies in their development.

Figure 5.1 Queen Creek Roadway Priorities



Note: The extension of Meridian to the southeast into Pinal County is shown for planning purposes only and is not intended to indicate an alignment or even necessarily a future road.

Table 5.2 Long-Term Roadway Project Prioritization

| ID | Project | Limits | Responsible Agencies | Cost | Commercial Development Support | Local Movement Support | Through Movements Support | Notes | Overall Priority |
|----|--|----------------------------------|--|--------|--------------------------------|------------------------|---------------------------|---|------------------|
| 1a | Meridian Expressway | Williams Gateway to Riggs/Combs | MCDOT, Mesa, Queen Creek, Pinal County | \$100M | Med | Low | High | Feasible because there is no existing Meridian Road | High |
| 1b | Meridian Expressway | Meridian to N/S Freeway | Pinal County | \$300M | Low | Low | High | Brings additional traffic to Queen Creek | Med |
| 2a | Widen Hunt Highway to 4 lanes | Ellsworth to Power Rd | Queen Creek, MCDOT | \$8.5M | Low | Med | High | Helps distribute traffic to Power Road | High |
| 2b | Widen Power Rd to 4 lanes | Hunt Hwy to Riggs Rd | MCDOT | \$3M | Low | Med | High | Completes a significant through arterial | High |
| 3a | Widen Gantzel/ Ironwood to 8 lanes | Hunt Hwy to Williams Gateway Fwy | Pinal County | \$35M | Low | Low | High | Draws through traffic away from Queen Creek | Medium |
| 4a | Widen Riggs/Combs to 8 lanes | I-10 to N/S freeway | MCDOT, Chandler, Gilbert, Queen Creek Pinal Co | \$74M* | Low | Low | High | Heavily utilized, but north-south capacity needs are more significant | Med |
| 5a | Widen Ocotillo to 4 lanes | Higley to Hawes | Queen Creek | \$18M | Med | High | Med | Completes east-west arterial; partial developer funding likely | High |
| 6a | Queen Creek Rd to Germann Rd Connector | | Queen Creek | \$29M | Low | Low | Med | Provides through movement link | Low |
| 7a | Widen Queen Creek to 4 lanes | Hawes to Signal Butte | Queen Creek | \$6M | Med | Med | Low | Undeveloped area of Queen Creek | Med |
| 8a | Construct Crismon Rd | Germann to Queen Creek | Queen Creek | \$4M | Low | Med | Low | Completes part of arterial network | Low |
| 9a | Construct/ widen Signal Butte to 6 lanes | Queen Creek Rd to Germann Rd | Queen Creek | \$7M | Low | Med | Low | Completes a scalloped segment; partial developer funding likely | Low |
| 9b | Construct Signal Butte to 4 lanes | Empire to Riggs | Queen Creek | \$5M | Low | Low | Low | Low traffic volumes | Low |

| ID | Project | Limits | Responsible Agencies | Cost | Commercial Development Support | Local Movement Support | Through Movements Support | Notes | Overall Priority |
|-----|-------------------------------|------------------------------|----------------------|-------|--------------------------------|------------------------|---------------------------|--|------------------|
| 10a | Construct Empire to 4 lanes | Ellsworth to Meridian | Queen Creek | \$12M | Low | Low | Low | Partial developer funding likely | Low |
| 11a | Construct Meridian to 4 lanes | Empire to Riggs | Pinal County, MCDOT | \$3M | Low | Low | Low | Completes last segment of Meridian | Low |
| 12a | Widen Sossaman to 4 lanes | Hunt Hwy to Chandler Heights | Queen Creek | \$5M | Low | Low | Med | Helps distribute through traffic to multiple arterials | Low |
| 13a | Widen Hawes Rd to 4 lanes | Hunt Hwy to Chandler Heights | Queen Creek | \$5M | Low | Low | Med | Helps distribute through traffic to multiple arterials | Low |
| 14a | Widen Cloud Road to 4 lanes | Ellsworth to Rittenhouse | Queen Creek | \$9M | Low | Low | Low | Partial developer funding likely | Low |

Note: For volume change, a reduction is desirable; for LOS change, an improvement is desirable.

*The cost estimate is for the segment of the road within Queen Creek only.

New High Capacity Facilities

The Queen Creek SATS grew out of ADOT's corridor definition studies, which were initiated to help determine the need for and feasibility of new high capacity facilities in Pinal County. Those studies noted the lack of a mature arterial system in Queen Creek as a contributor to future expected congestion.

The Arizona Department of Economic Security currently projects around 800,000 residents in Pinal County by 2030. The Pinal County SATS, completed in 2006, identified a 2030 population of 1.9 million residents. At 800,000 residents, improving the arterial system in Queen Creek is sufficient to address future congestion concerns. At 1.9 million, it is not.

In addition, it is not possible to develop a mile-spaced arterial system within Queen Creek. Several north-south roads (Signal Butte, Crismon, and Hawes) cannot be completed due to development or, in the case of Hawes, the Williams Gateway Airport. Development also precludes completion of a couple east-west roads, including Queen Creek and Chandler Heights. Finally, the UP Southeast railroad presents a major barrier cutting from the northwest to southeast corner of the town – capacity improvements across or along the railroad will be significantly more expensive and difficult to implement.

In order to address the need for new facilities, a sketch planning comparison was made between additional arterial capacity and high capacity roadways. This analysis began with the base future (2026) scenario from the model runs, but did not use the MAG model to conduct the analysis. Table 5.3 presents a comparison of adding new arterial capacity, expanding the proposed freeways from the corridor definition study, and adding a new high capacity facility in addition to those proposed freeways. The table identifies the impact on the average volume per lane during the peak hour of the arterial system in Queen Creek and the surrounding area. On average, a fully access-controlled facility can handle about 2,000 vehicles per hour in each lane at acceptable speeds and driving distances. An arterial can handle many fewer vehicles, roughly 800 at acceptable speeds and driving distances. When the number of vehicles exceeds this number, the road becomes severely congested.

Adding additional capacity to the proposed freeway system (8 lanes instead of 6) reduces traffic on the arterial system by about 15 percent. Completing all of the projects identified in the Queen Creek SATS saves an additional 10 percent. However, adding a new high capacity facility, instead of these local improvements, reduces traffic on the arterial system by 35 percent, reducing the volume on arterials to around 800 vehicles per hour in the peak period, which is within an acceptable range for arterials. If the residential population of Pinal County grows as much and as fast as expected by the Pinal County SATS (and without parallel job growth), then additional capacity may be needed to provide congestion relief for Queen Creek.

Table 5.3 Impact of Investments of Peak-Hour Volumes

| Scenario | Description | Average Peak-Hour Volume Per Lane on Queen Creek's Arterials |
|-------------------------------------|--|--|
| Base future | Williams/North-South Freeways at 6 lanes | 1,560 |
| Extra lanes on freeways | Williams/North-South Freeways at 8 lanes | 1,330 |
| Extra lanes + Queen Creek build out | Williams/North-South Freeways at 8 lanes; build out of Queen Creek arterial system | 1,200 |
| Extra lanes + new facility | Williams/North-South Freeways at 8 lanes; additional 6-lane freeway along Meridian and extending into Pinal County | 770 |

Note: Based on a sketch planning analysis of new facilities; assumes that a freeway lane can handle a peak volume of 2,000 vehicles per hour.

There is no obvious place to locate an additional access-controlled high capacity facility in the Queen Creek area, nor is it the objective of this study to identify the needs for such a facility. The recommendation of this study is that ADOT closely examine the location of the North-South freeway in its upcoming Design Concept Report (DCR). The DCR will revisit the needs and feasibility analysis developed as part of the ADOT Corridor Definition Studies. It may also be useful to consider new or upgraded regional or county roads or adding capacity to other state highways in the Pinal County that provide connections to Maricopa County. In particular, improvements to SR 79 and U.S. 60 may have the potential to help shift some of the through traffic away from Queen Creek, depending, in part, on the location selected for the North-South freeway.

Implications of Pinal County Growth

The analysis in this report is contingent on the growth forecasts used for Pinal County. Although the late 1990s and early 2000s produced rapid population growth in Pinal County, this growth has substantially cooled. The population forecasts used for this study were taken from the Pinal County SATS, which predicted a 20-year period of the fastest growth rates that any county in the U.S. has ever had, averaging over 10 percent per year.

It is useful to consider the significance of these forecasts on the transportation system in Queen Creek. At the start of this project, two scenarios were considered for Pinal County – the Pinal County SATS-based projects and a second set of projections from the Arizona DES. These latter projections showed slightly less than one-half the population level of the Pinal County SATS projections, or a total of about 800,000 people in Pinal County by 2026. Figure 5.2 presents the future speeds and intersection level of service for 2026 using the DES forecasts.

Figure 5.2 Volumes and Intersection LOS Based on Arizona DES, 2026



5.3 PUBLIC TRANSPORTATION PRIORITIES

The short-term priorities for these services include the following:

- Express service to Tempe/ASU/Sky Harbor, begun in 2007 (Line 534);
- Fixed-route service to Chandler, expected in later 2007; and
- Future service to major destinations in Mesa along the U.S. 60 corridor, most notably the Superstition Mall area, which alone receives 250 daily commuters.

Other destinations currently have fewer than 200 commuters per day (except Queen Creek itself), which is not significant enough to warrant transit service at this time. As the Williams Gateway area continues to grow, this will become a future potential destination. Notably, there are relatively few commuters to downtown Phoenix, despite being the largest employment hub of the region. This is likely due to the distance from Queen Creek to downtown Phoenix, but future residential growth may change the commute patterns of Queen Creek's residents. Queen Creek and Valley Metro should continue to monitor commuting patterns to determine the most appropriate services to implement.

In the timeframe of the SATS, the continued development of expressed and fixed bus routes is the most appropriate investment. Commuter rail has potential to carry a substantial number of passengers per year at the proposed Queen Creek station, as well as at the potential stations identified in Pinal County. However, the cost of implementation for this service is high and the benefits are unclear. Unlike local bus service, which will primarily serve Queen Creek residents, commuter rail may well attract more drivers into Queen Creek from outside the city boundaries to use the service. Three factors - locating the station in the southeastern part of Town, developing parking charges to discourage the station's use as a park-and-ride facility, and developing stations in Pinal County - may help ensure that the commuter rail investment has the intended congestion mitigation impact. However, initial development of a station area as a park-and-ride facility would be appropriate in the short term to help generate demand for public transportation. Queen Creek could provide free parking at the lot for town residents to limit added congestion. This approach would establish the site as a transit center that could be served by all types or routes, and would also ensure that a site is available for eventual commuter rail service.

A local circulator may also become appropriate in the future, but current demographics in Queen Creek make this service less likely to succeed than the one in Ahwatukee. As Queen Creek grows, it will have a significant school age population. One of the key successes of the ALEX shuttle is providing a method for kids to get home from after-school activities, especially for households where all adults are employed.

5.4 NON-TRANSPORTATION SOLUTIONS

Although the focus of the SATS is on identifying transportation problems and solutions, there are other broader considerations that could have a significant impact on future congestion in Queen Creek and the region. At the regional level, it will be vital to start considering the future relationship between Maricopa and Pinal Counties. By the time of the 2010 Census, parts of Pinal County will be large enough to be considered a metropolitan area. Given the commuting relationship between the two counties, it will be vital to begin early coordination between these two entities.

One solution that should be considered is an attempt to balance population growth in Pinal County with new sources of employment. Figure 5.3 presents the expected population to employment ratio (the number of people living in an area relative to the number of people working in the same area) in 2026, using the population and employment data that has been considered in this study. The ratios in the figure have been calculated by the municipal planning areas used in the MAG model, which correspond roughly to individual towns and cities, rather than by individual zones.

Most of Pinal County, especially the areas with significant population, have at least four times more people than jobs – the overall ratio for Maricopa County is around 2.5. Some parts of the County – notably the current state lands area that is slated for massive development in the future – are expected to have over 10 times as many people as jobs. Pinal County, the Central Arizona Association of Governments (CAAG), and MAG should work closely together to help ensure that employment in Pinal County grows apace with population. This would have major benefits for Pinal County, Queen Creek, and much of Maricopa County. Improving the balance of population and employment will do more than anything else to reduce the congestion identified in this study. As a result, it will reduce the need to invest as heavily in high capacity corridors.

Both Pinal County and economic development agencies within the County are working to address the employment issue through marketing activities, additional planning studies, and other efforts. As the broader region continues to grow, it will be useful to consider regional solutions to support these efforts.

Figure 5.3 Population-Employment Ratio in the MAG Model Area, 2026

