



Pinal County Corridors Definition Study

Working Paper No. 2 – Evaluation of Planning-Level Corridor Definition Alternatives

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1. INTRODUCTION

This report documents the results of the needs and feasibility analysis for the Pinal County Corridors Definition Study. The findings documented in this working paper will be presented at public meetings to receive input from the public, stakeholders, and elected officials. Input received from public meetings will be combined by ADOT staff with the results documented in this working paper to develop corridor definition recommendations for consideration by the State Transportation Board. Specifically, this report presents:

- § Findings and conclusions of the needs analysis;
- § Development of corridor definition alternatives;
- § Feasibility analysis of corridor definition alternatives
- § Recommended corridor definition alternative
- § Summary of the next steps that are required for corridor development

1.1 Background Information

The Southeast Maricopa/Northern Pinal County Transportation Study (SEMNPTS), completed in September 2003 by the Maricopa Association of Governments, the Central Arizona Association of Governments, and the Arizona Department of Transportation, recommended \$12 to \$14 billion worth of transportation improvements for the southeastern Maricopa County and northern Pinal County areas. These improvements were recommended to meet the transportation needs of the 1.3 million people that are projected to live in the area roughly bounded by US 60 and SR 79 on the east, Loop 101 and the Gila River Indian Community on the west, US 60 on the north, and Coolidge and Florence on the south, by the year 2030. Recommended improvements included nearly 3,000 lane miles of new and improved arterials, an enhanced transit system, improvements to existing freeway corridors, and 95 miles of new freeways. Specific SEMNPTS recommendations included the development and/or improvement of four highway corridors that would improve mobility within the region for both Maricopa and Pinal Counties:

- § East Valley Corridor (I-10 to Florence Junction).
- § Apache Junction/Coolidge Corridor (I-10 to US 60).
- § US 60 Freeway Re-route (Baseline to Ray Roads), an
- § Williams Gateway Corridor (Loop 202 to US 60).

Since completion of the SEMPTS, several actions were taken to advance the development of the new freeway corridors including:

- § The CAAG Regional Council adopted a resolution and requested that ADOT conduct transportation planning efforts on the four corridors.
- § House Bill 2456 was passed by the Arizona Legislature assigning to MAG, CAAG, and ADOT the responsibility for carrying out further definition of the corridors identified in the SEMNPTS for right-of-way preservation and to provide the State Transportation Board with information to consider these corridors for adoption into the State Highway System by December 31, 2008.

ADOT has assumed responsibility for initiating and managing the studies required by House Bill 2456 and is conducting three separate studies for the four corridors – the *Williams Gateway Corridor Definition Study*, the *US 60 Corridor Definition Study*, and the *Pinal County Corridors Definition Study* (Apache Junction/Coolidge Corridor and the East Valley Corridor). Each study will provide recommendations to the State Transportation Board as to the types of future corridors (i.e. freeways, parkways), the general location of the corridors, and the jurisdictional

responsibility for the facilities. Although the *Southeast Maricopa/Northern Pinal County Transportation Study* serves as a resource to the three Corridor Definition Studies, the studies will reassess corridor need and feasibility.

In September 2004, ADOT awarded a contract for the *Pinal County Corridors Definition Study* to Kimley-Horn and Associates. The study objectives are listed below.

- § Confirm the need for the East Valley and the Apache Junction/Coolidge corridors (**Figure 1-1**);
- § Define planning-level corridor (2030) definition alternatives based on regional freeway planning principals, existing and future corridor conditions, and input from affected jurisdiction and stakeholders;
- § Perform a technical feasibility assessment of engineering, environmental, and land use compatibility characteristics of alternative corridor definitions;
- § Identify to the extent possible, feasible and preferred planning-level corridor definitions on the basis of the technical evaluation;
- § Document planning-level costs of corridor development (including studies, design, construction, and right-of-way costs) for feasible and preferred corridor definitions
- § Document the extent to which affected jurisdictions and stakeholders support the recommended corridor definitions.

The *Pinal County Corridors Definition Study* will result in technical recommendations and investment criteria so that ADOT and the State Transportation Board can evaluate options for the future jurisdictional responsibilities for the corridors. This study will include sufficient detail to provide a basis for the future establishment of geometric roadway alignments and corridor design concepts, the preservation of right-of-way, and the identification of required environmental clearance studies.

1.2 Needs and Feasibility Evaluation Process

As previously stated, the *Pinal County Corridors Definition Study* will evaluate the need for and the feasibility of constructing state highway corridors in Pinal County to supplement the future transportation system to be developed in northeast Pinal County. The results of the needs and feasibility analysis will serve as input to recommendations regarding inclusion of the proposed corridors into the state highway system.

1.2.1 Needs Evaluation Criteria

The corridor needs evaluation process includes four primary criteria:

- § First, it must be demonstrated that the future (2030) transportation network (without the proposed corridors) will not be able to accommodate the projected vehicle demand in 2030.
- § Second, the state highway corridor(s) must attract enough volume in 2030 to warrant a new roadway. Corridors that do not attract enough volume to warrant a new roadway will not be recommended.
- § Third, the corridors must provide some degree of relief to other transportation facilities within the study area. Corridor segments that do not attract a sufficient amount of traffic will not be recommended.
- § Fourth, the corridors must establish connectivity with the existing state highway system. Policies of the State of Arizona Transportation Board assert that the State Highway System should include routes that are primarily designed to carry through



traffic and that connect regions and population centers to improve mobility and commerce throughout the state. Corridors that primarily serve local traffic are the responsibility of local jurisdictions. The primary purpose of the corridors will be to provide for interregional and longer intraregional trips that connect residents to employment, recreation, and other opportunities. Corridors will not be recommended for areas that are better served by improving the local arterial system.

The results of the needs analysis are documented in **Section 2** of this report.

1.2.2 Feasibility Evaluation Overview

The next step following corridors needs analysis is to determine the feasibility of constructing the corridors. The purpose of the feasibility analysis is to identify potential opportunities and constraints for the location of the corridor and to identify any engineering, environmental, socioeconomic, and land use compatibility issues that would make it impractical to construct the corridor. The results of the feasibility analysis are presented in **Section 3** of this report.

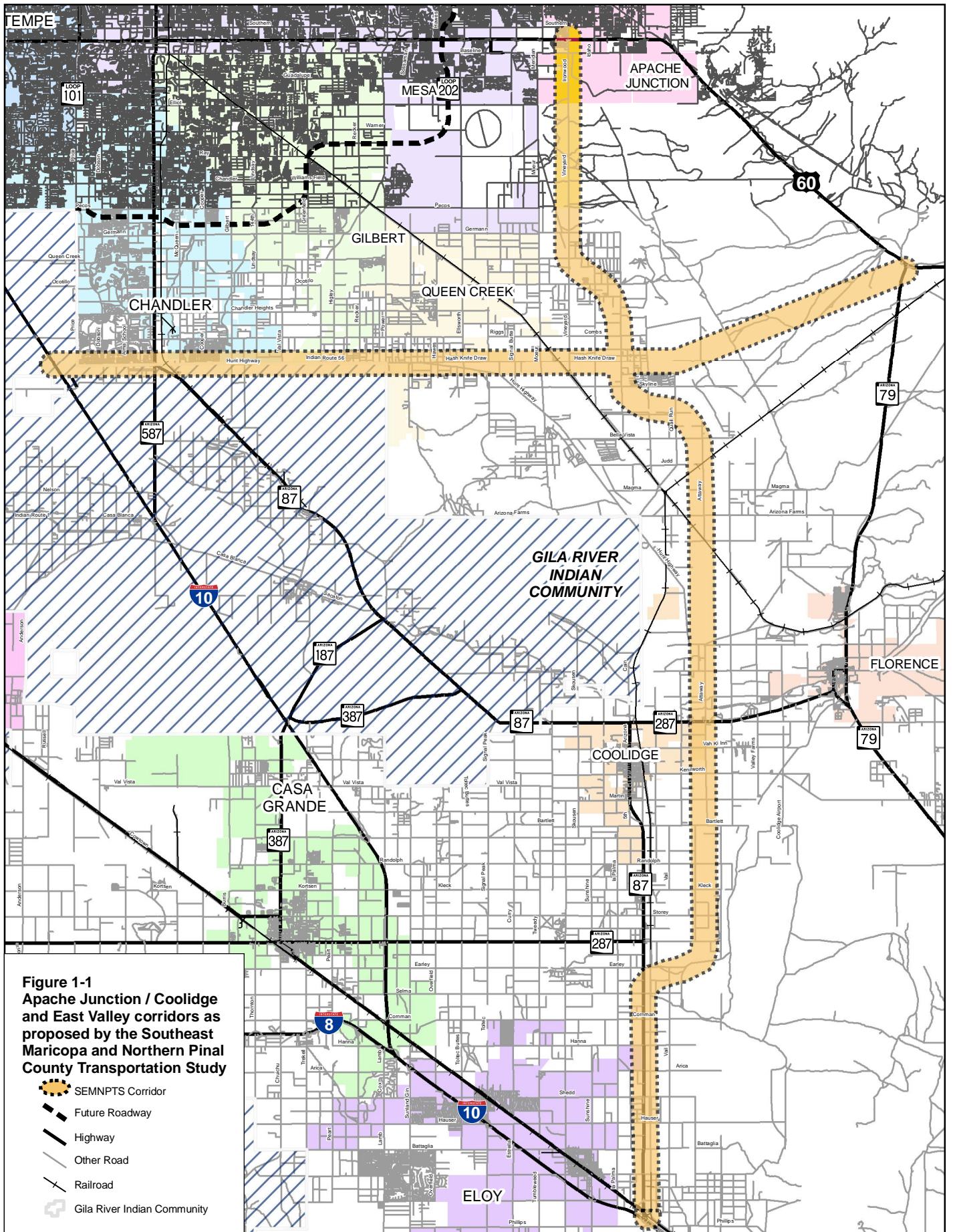


Figure 1-1
Apache Junction / Coolidge
and East Valley corridors as
proposed by the Southeast
Maricopa and Northern Pinal
County Transportation Study

- SEMNPTS Corridor
- Future Roadway
- Highway
- Other Road
- Railroad
- Gila River Indian Community

N

0 1 2 3 4 5 Miles

Data Source:
 Arizona Land Resource Information System

PINAL COUNTY CORRIDORS DEFINITION STUDY

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2. CORRIDORS NEEDS ANALYSIS

As previously explained, the purpose of the corridor needs analysis is to identify the corridor(s), or portions of the corridors that will:

- § Attract enough volume in 2030 to warrant a major transportation facility;
- § Provide relief to other transportation facilities within the study area, and;
- § Improve inter-regional and intra-regional mobility within the study area.

Section 2.1 describes the transportation demand model that formed the basis of needs analysis. **Section 2.2** presents the findings and conclusions of the needs analysis.

2.1 Pinal County Planning Model

The needs analysis is based upon the projected number of vehicles that will use the roadway system within the study area in the year 2030. This vehicle demand is estimated by creating various scenarios in the Pinal Corridors Planning Model¹. Scenarios developed with the PCPM ranged from the base condition ‘no-build’ (no new corridors are constructed), to ‘construct all new corridors’. These scenarios were incrementally analyzed to create a final scenario – the Corridor Concept. The Corridor Concept scenario includes the portions of the study corridors that meet the needs analysis criteria listed above.

Table 2-1 is a synopsis of each step of the scenario modeling process that was followed to develop the Corridor Concept. The emergent Corridor Concept was then carried forward to the feasibility analysis that is described in **Section 3.0**.

Table 2-1 – Needs Analysis Scenarios

Scenario	Description
Step 1 –2030 Base Future Network	<ul style="list-style-type: none"> • No new freeway corridors; • All planned or programmed investments in Maricopa County consistent with 2030 Maricopa Association of Governments Regional Transportation Plan; • Planned and programmed investments in Pinal County; as consistent with Pinal County Transportation Improvement Program, Pinal County Small Area Transportation Plan, Apache Junction Small Area Transportation Plan, plus very basic arterial infrastructure that will be required to support future development that will be constructed in conjunction with large developments and master planned communities. • Development of an arterial system through State Trust Lands; • Widening of existing arterials to 4 lanes throughout Pinal County; • No change to the existing state highway system, except for I-10, which is expected to be widened to 6 lanes.

¹ Pinal County Corridors Definition Study, Working Paper No. 1 – Existing and Future Conditions, Needs and Deficiencies. June 1, 2005. Available at <http://tpd.azdot.gov/planning/corridorstudies.php>.

Table 2-1 – Needs Analysis Scenarios (continued)

Scenario	Description
Step 2 –2030 Enhanced Future Network	<ul style="list-style-type: none"> • No new freeway corridors; • Improvements as described in the 2030 Base Future Network, with the following modifications: <ul style="list-style-type: none"> - Widening the future arterial network in Pinal County from 4 to 6 lanes north of SR 287; - Widening the non-interstate state highway network from 2 to 4 lanes. • No changes to improvements identified in the MAG Regional Transportation Plan.
Step 3 –2030 SEMNPTS Corridors Network	<ul style="list-style-type: none"> • Improvements as described in 2030 Base Future Network; • The four (4) corridors proposed by the 2003 Southeast Maricopa/Northern Pinal Transportation Study; <ul style="list-style-type: none"> - Apache Junction/Coolidge Corridor (North-South Corridor) extending from US 60 at Idaho Road (Apache Junction) to I-10 at SR-87 (Eloy); - East Valley Corridor (East-West Corridor), extending from I-10 (Chandler) to US 60 (Florence Junction); - US 60 Re-route (<i>Refer to US 60 Corridor Study</i>); - Williams Gateway Corridor, extending from Pinal County line to US 60 (<i>Refer to MAG Williams Gateway Corridor Study</i>);
Step 4 –2030 Corridor Concept Network	<ul style="list-style-type: none"> • Improvements as described in 2030 Base Future Network; • New corridors with facility level and number of lanes determined based upon a joint study team review of traffic volumes on the 2030 SEMNPTS Corridors Network, and from analysis of a number of “what-if” scenarios as described in Appendix A. The Corridor Concept includes: <ul style="list-style-type: none"> - Apache Junction/Coolidge Corridor (North-South Corridor) extending from Williams Gateway Corridor alignment (approx. Frye Road) to SR-287 in Florence. - US 60 Re-route (<i>Refer to US 60 Corridor Study</i>); - Williams Gateway Corridor, extending from Pinal County line North-South corridor (<i>Refer to MAG Williams Gateway Corridor Study</i>);
Step 5 –2030 Corridor Concept Network (Plus State Highway Improvements)	<ul style="list-style-type: none"> • All improvements as described in Corridor Concept Network. • Improvement of existing non-interstate state highway facilities (e.g., SR-79, SR-287) to 4-lanes.

2.1.1 2030 Base Future Network

The 2030 Base Future Network represents the expected future transportation system in the study area in the year 2030 with the understanding that this future system may change as a result of ongoing and future transportation planning studies in Pinal County. The 2030 Base Future Network is based on the existing plans of Maricopa Association of Governments, Pinal County, local cities and towns, and assumptions about the basic arterial network that will be needed support expected future development.

The 2030 Base Future Network represents the baseline ‘no-build’ scenario which represents conditions in the year 2030 assuming that none of the study corridors are constructed.

As outlined in **Table 2-1**, the 2030 Base Future Network includes the following elements:

- § Roadway improvements within Maricopa County are consistent with the Maricopa Association of Governments 2030 Regional Transportation Plan (MAG RTP). The MAG RTP includes arterial widening and the extension of the grid system.
- § Roadway improvements in Pinal County are consistent with the Pinal County Transportation Improvement Program and Pinal County Transportation Plans. In addition, it was assumed that a basic 4-lane arterial system will continue to be implemented and expanded (by developers and builders) as the rapid pace of development continues.
- § The number of lanes on the non-interstate state highway system (SR-79, SR-87, SR-287) remains as it is today (generally 1-lane in each direction).
- § Interstate-10 is widened to 3 lanes in each direction.

The roadway system that is modeled in the 2030 Base Future Network is depicted in **Figure 2-1**.

Any new corridors that are included in the final recommendation must demonstrate that they favorably improve traffic conditions as compared to the 2030 Base Future Network.

2.1.2 2030 Enhanced Future Network

The 2030 Enhanced Future Network includes all of the arterial and freeway improvements that are included in the 2030 Base Future Network, and some additional local and regional investments in the transportation network. No new corridors are included in the 2030 Enhanced Future Network. The purpose of this scenario was to evaluate the benefits that would result from additional investments and expansion in the arterial system in Pinal County. The 2030 Enhanced Future Network is focused primarily on developing a more mature arterial system in the portion of Pinal County that is currently State Trust Land, but is expected to have substantial additional population by the year 2030. As outlined in **Table 2-1**, the 2030 Enhanced Future Network includes the following elements:

- § Improvements as described in the 2030 Base Network, with the following modifications:
 - The basic arterial system in Pinal County, north of SR-287, is widened from 4 to 6 lanes. The basic arterial system in Pinal County, south of SR-287, remains at 4 lanes.
 - The number of lanes on the non-interstate state highway system (SR-79, SR-87, and SR-287) is expanded to 4 lanes.

The roadway system that is modeled in the 2030 Base Enhanced Network is depicted in **Figure 2-2**.

2.1.3 2030 Southeast Maricopa/Northern Pinal Transportation Study (SEMNPTS) Corridors Network

The corridors recommended in the *Southeast Maricopa/Northern Pinal Transportation Study* are modeled in the 2030 SEMNPTS Corridors Network. The corridors, as recommended in SEMNPTS, provided a starting point for the corridors needs analysis. The 2030 SEMNPTS Corridors Network contains the following improvements:

- § Improvements as described in 2030 Base Network;
- § The four corridors proposed by the *2003 Southeast Maricopa/Northern Pinal Transportation Study*. These are:
 - Apache Junction/Coolidge Corridor (North-South Corridor) extending from US 60 at Idaho Road (Apache Junction) to I-10 at SR-87 (Eloy);
 - East Valley Corridor (East-West Corridor), extending from I-10 (Chandler) to US 60 (Florence Junction);
 - US 60 Re-route (Refer to *US 60 Corridor Study*);
 - Williams Gateway Corridor, extending from Pinal County line to US 60 (Refer to *MAG Williams Gateway Corridor Study*);

The SEMNPTS Corridors Network is depicted in **Figure 2-3**. The SEMNPTS corridors illustrated in Figure 2-3 reflect refinements in the corridors and a possible scenario of a future arterial road network system in Pinal County that were communicated to ADOT by Pinal County and local jurisdictions during meetings conducted for this study.

2.1.4 2030 Corridor Concept Network

The 2030 Corridor Concept Network was developed based on analysis and review of the 2030 Base Future Network, 2030 Enhanced Future Network, the 2030 SEMNPTS Network, and a series of iterative model scenarios (described in **Appendix A**). Detailed discussion of this network is deferred until **Section 2.4**.

2.1.5 2030 Corridor Concept Network (Plus State Highway Improvements)

The 2030 Corridor Concept (Plus State Highway Improvements) Network contains the 2030 Corridor Concept and additional improvements to the State Highway System. Specifically, the non-interstate state highways (SR-87, SR-287, SR-79) within the study area are assumed to be 4 lanes.

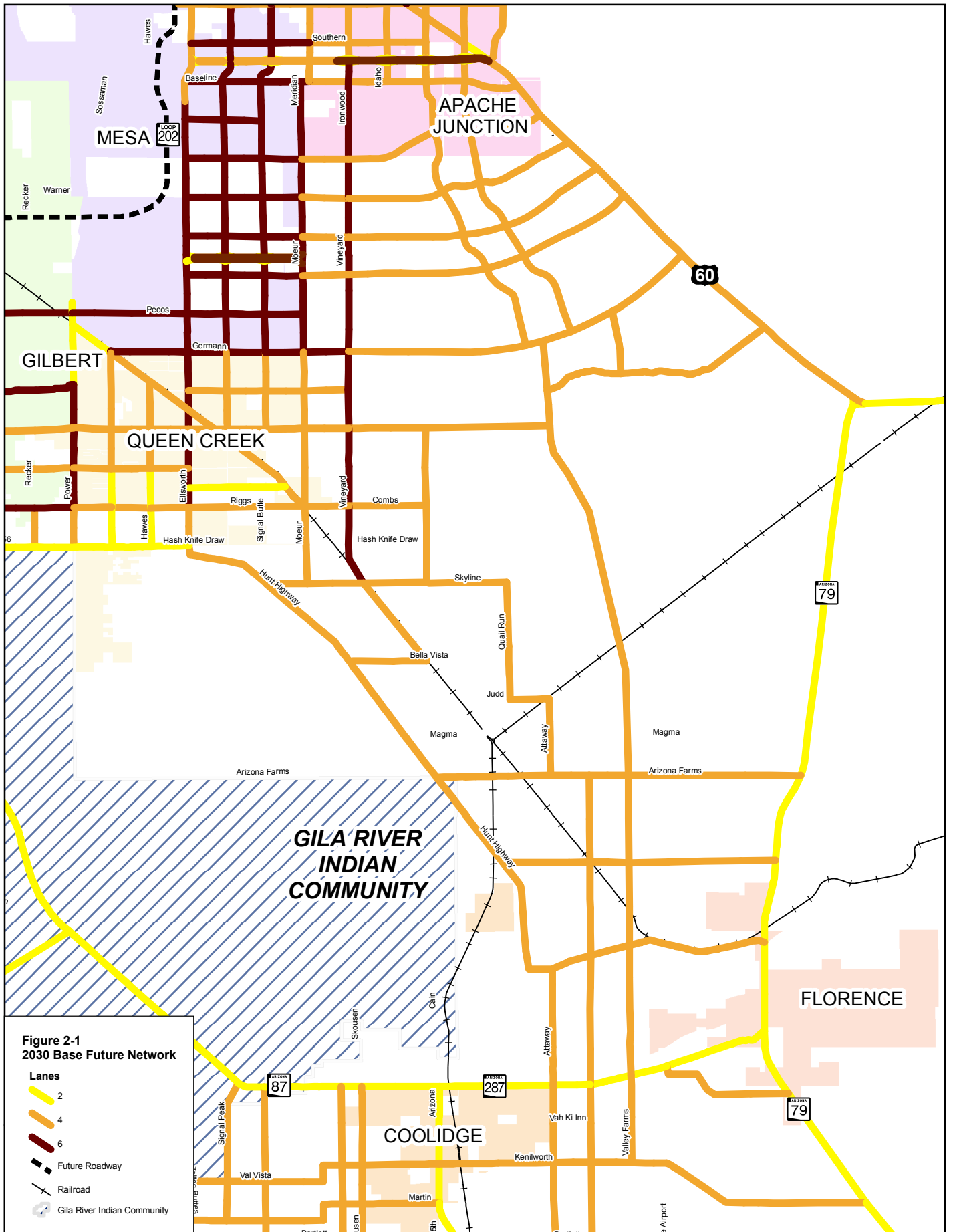
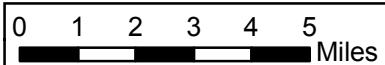


Figure 2-1
2030 Base Future Network

- Lanes**
- 2
 - 4
 - 6
 - Future Roadway
 - Railroad
 - Gila River Indian Community

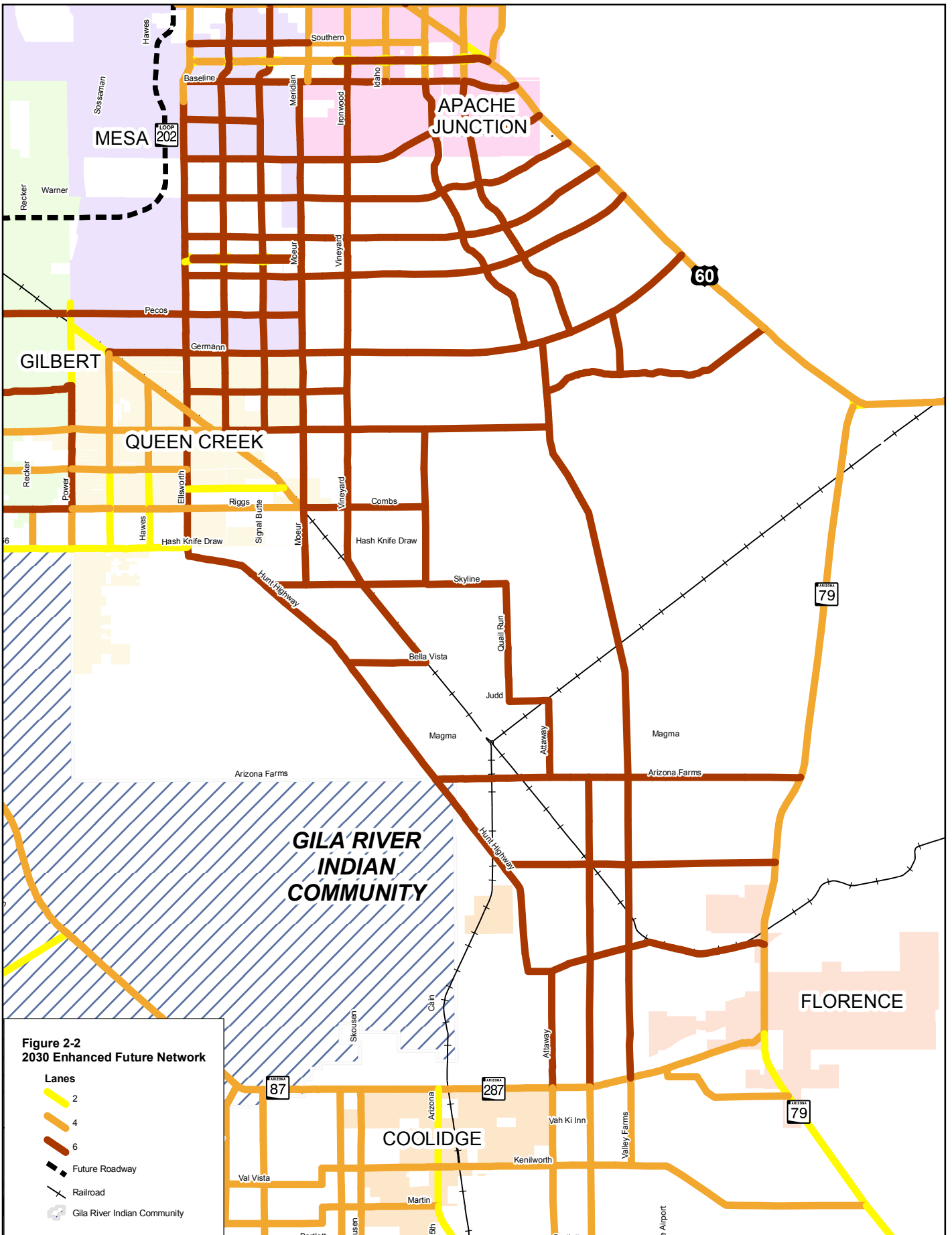


Data Source:
Arizona Land Resource Information System



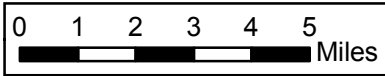
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**Figure 2-2
2030 Enhanced Future Network**

- Lanes**
- 2
 - 4
 - 6
 - Future Roadway
 - Railroad
 - Gila River Indian Community



Data Source:
Arizona Land Resource Information System



Kimley-Horn
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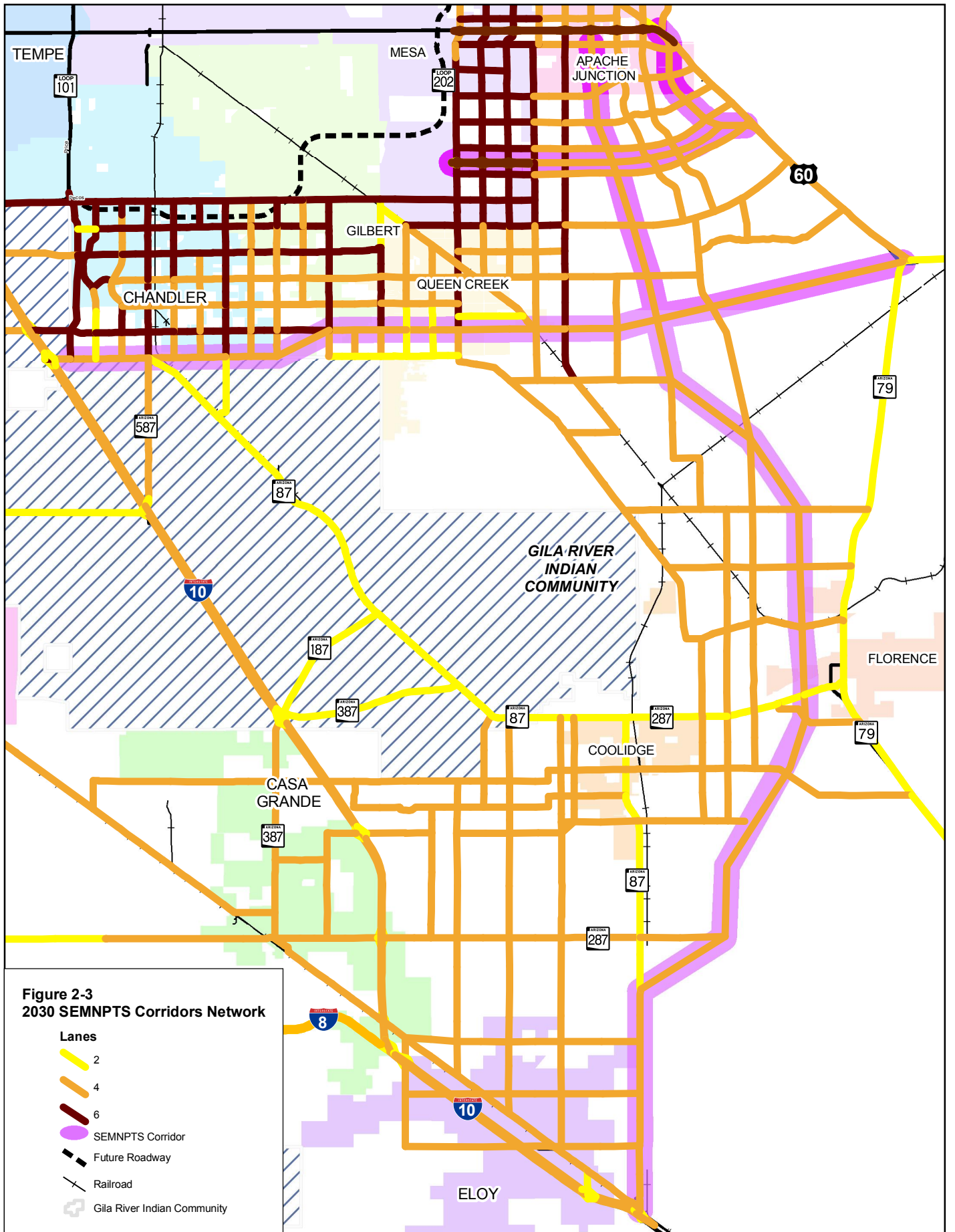


Figure 2-3
2030 SEMNPTS Corridors Network

Lanes

2

4

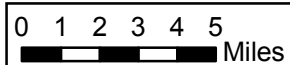
6

SEMNPPTS Corridor

Future Roadway

Railroad

Gila River Indian Community



Data Source:
 Arizona Land Resource Information System



Kimley-Horn
 and Associates, Inc.



2.2 Needs Analysis Findings

The modeling results of the 2030 Base Future Network are shown in **Figure 2-4**, and for the 2030 SEMNPTS Network in **Figure 2-5**. Each figure displays traffic volumes and the level of congestion projected in the year 2030. Level of congestion is determined by calculating a traffic volume-to-roadway capacity ratio for each roadway segment. Roads with a traffic volume-to-roadway capacity ratio of less than 0.8 are considered uncongested. Roads with a traffic volume-to-roadway capacity ratio between 0.8 and 1.0 are considered moderately congested, and roads with a volume-to-capacity ratio greater than 1.0 are considered congested.

Incremental analysis of the results of the 2030 Base Future Network scenario and for the 2030 SEMNPTS Network scenario, in addition to analysis of several ‘what-if’ scenarios, led to the development of the Corridor Concept. Specifically, this analysis consisted of the following steps:

- § ADOT and all three study teams (Kimley-Horn and Associates, Cambridge Systematics, Lima and Associates) jointly reviewed the results of the 2030 Base Future Network and for the 2030 SEMNPTS Corridors Network. Based upon the joint review, the SEMNPTS corridors were divided into segments consistent with the location of other infrastructure, proposed roads, jurisdictional boundaries, and the level of traffic volume. The corridors segments are illustrated in **Figure 2-6**.
- § Following division of the corridors into segments, the facility type (e.g., arterial, parkway, and freeway) and the number of lanes assigned to each SEMNPTS corridor was reevaluated. The number of lanes and facility type were reassigned to be consistent with what is needed to support the projected traffic volumes. **Table 2-2** shows the facility type and number of lanes that were reassigned to each corridor segment for the North-South corridor and the East-West corridor.

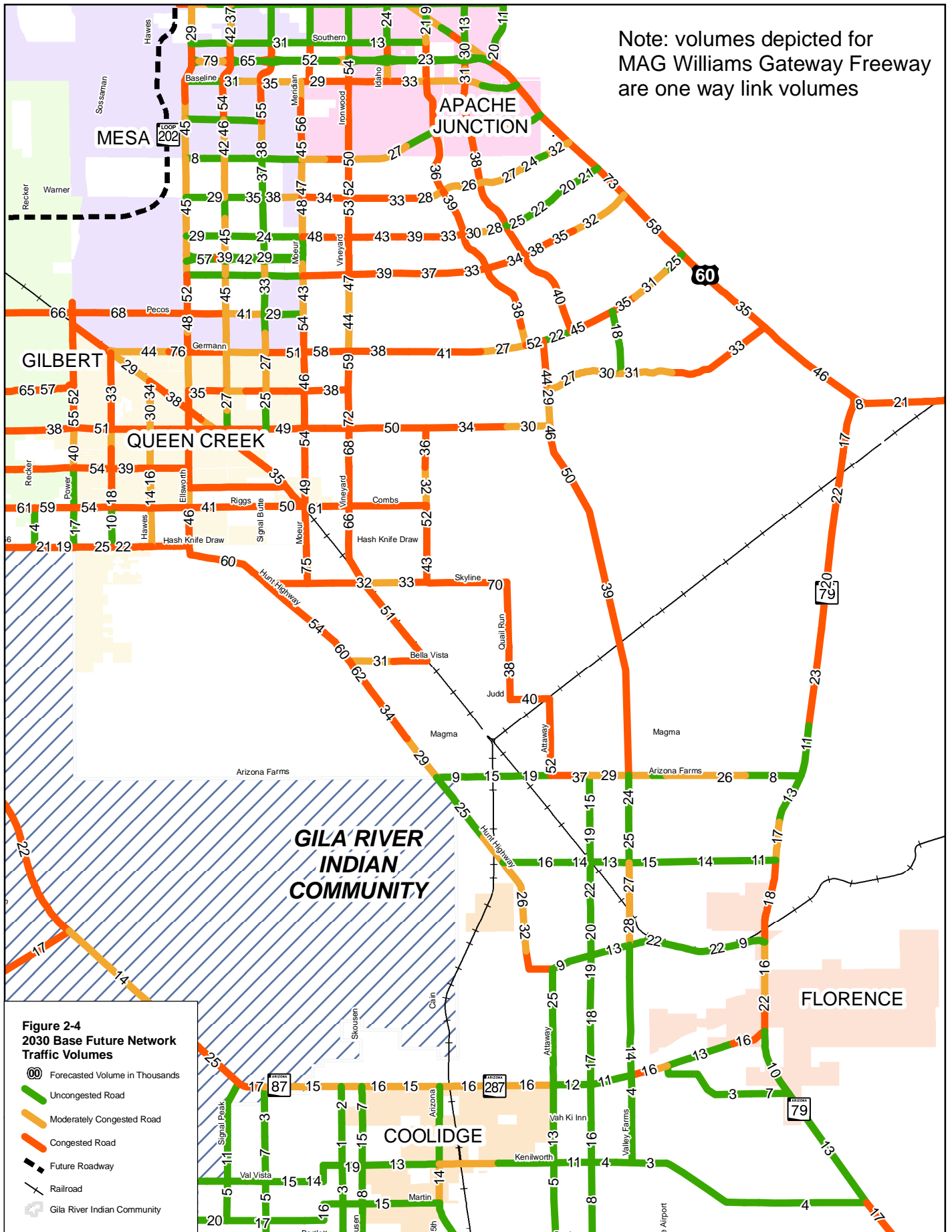
Table 2-2 – Lanes and Facility Level Assignments by Corridor Segment

Corridor Segment	Segment Description	Model Assumptions for Facility Level and Number of Lanes
North-South Corridor (Apache Junction/Coolidge Corridor)		
1	I-10 to SR-287	4 lane uncontrolled facility on existing SR-87, 2 lane limited access on new alignment to intersection with SR-287
2	SR-287 to East Valley Corridor	Access controlled (freeway) 6 lanes
3	East Valley Corridor to Williams Gateway	Access controlled (freeway) 6 lanes
4	Williams Gateway to US 60	Uncontrolled 4 lanes
East-West Corridor (East Valley Corridor)		
5	I-10 to Queen Creek	Limited access 6 lanes on existing Hunt Highway alignment
6	Queen Creek to North/South Corridor	Access controlled 6 lanes on existing Riggs Road alignment
7	North/South Corridor to Florence Junction	Limited access 4 lanes

- § The model was re-run yielding updated traffic volumes for each of the revised corridor segments. A number of additional ‘what-if’ scenarios were developed and the model was run

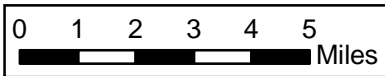
for each scenario. A description of the ‘what-if’ scenarios is included in **Appendix A**. The study teams jointly reviewed traffic volumes for each ‘what-if’ scenario. Corridor segments were again refined (facility levels and number of lanes modified) resulting in the Corridor Concept. Corridor segments that did not attract sufficient traffic volumes to warrant a new corridor, or did not demonstrate a benefit to the surrounding arterial network were not included in the Corridor Concept. The Corridor Concept is explained in detail in **Section 2.3**.

Note: volumes depicted for
MAG Williams Gateway Freeway
are one way link volumes



**Figure 2-4
2030 Base Future Network
Traffic Volumes**

- Forecasted Volume in Thousands
- Uncongested Road
- Moderately Congested Road
- Congested Road
- Future Roadway
- Railroad
- Gila River Indian Community

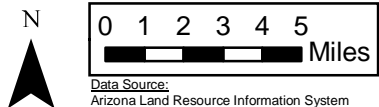
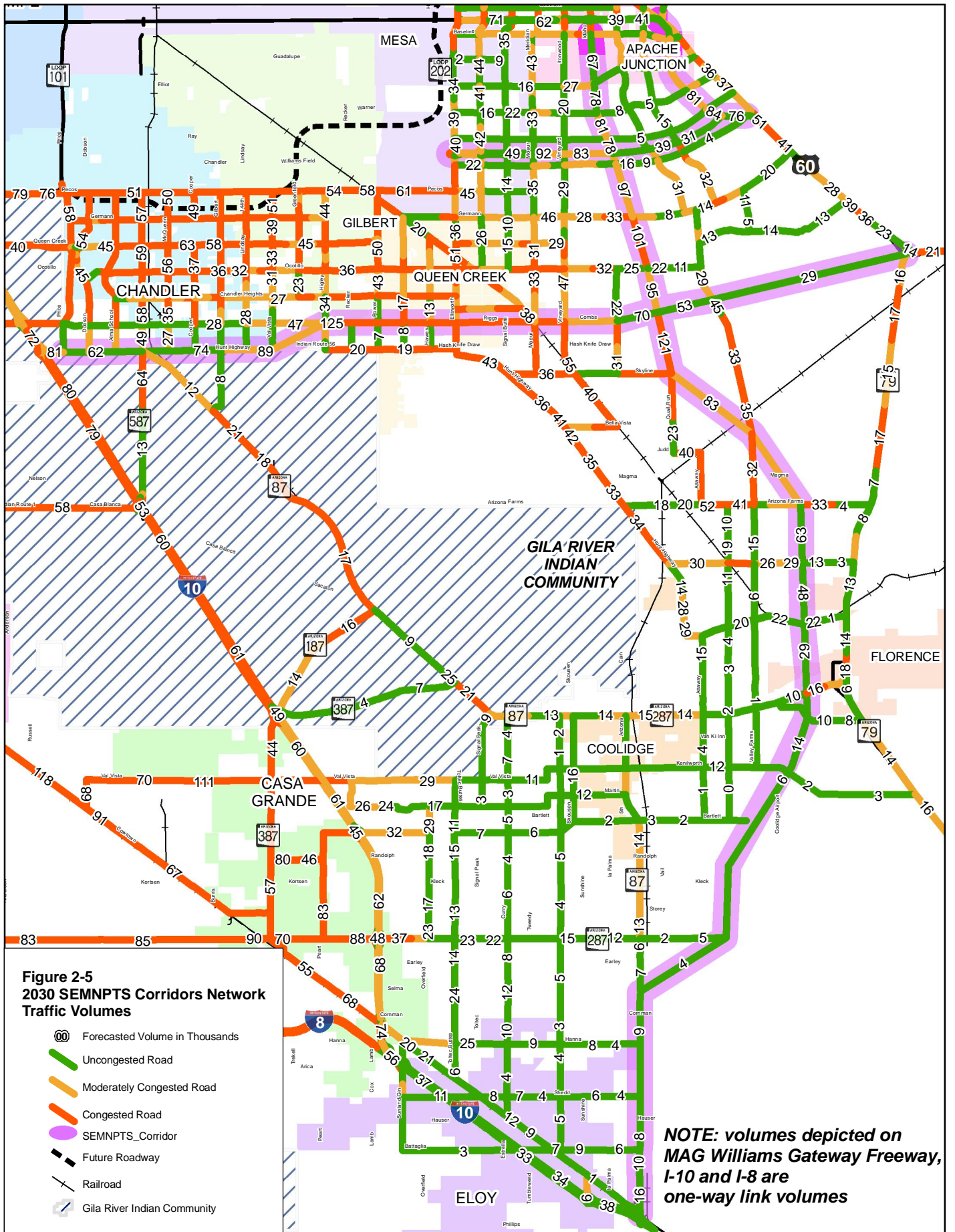


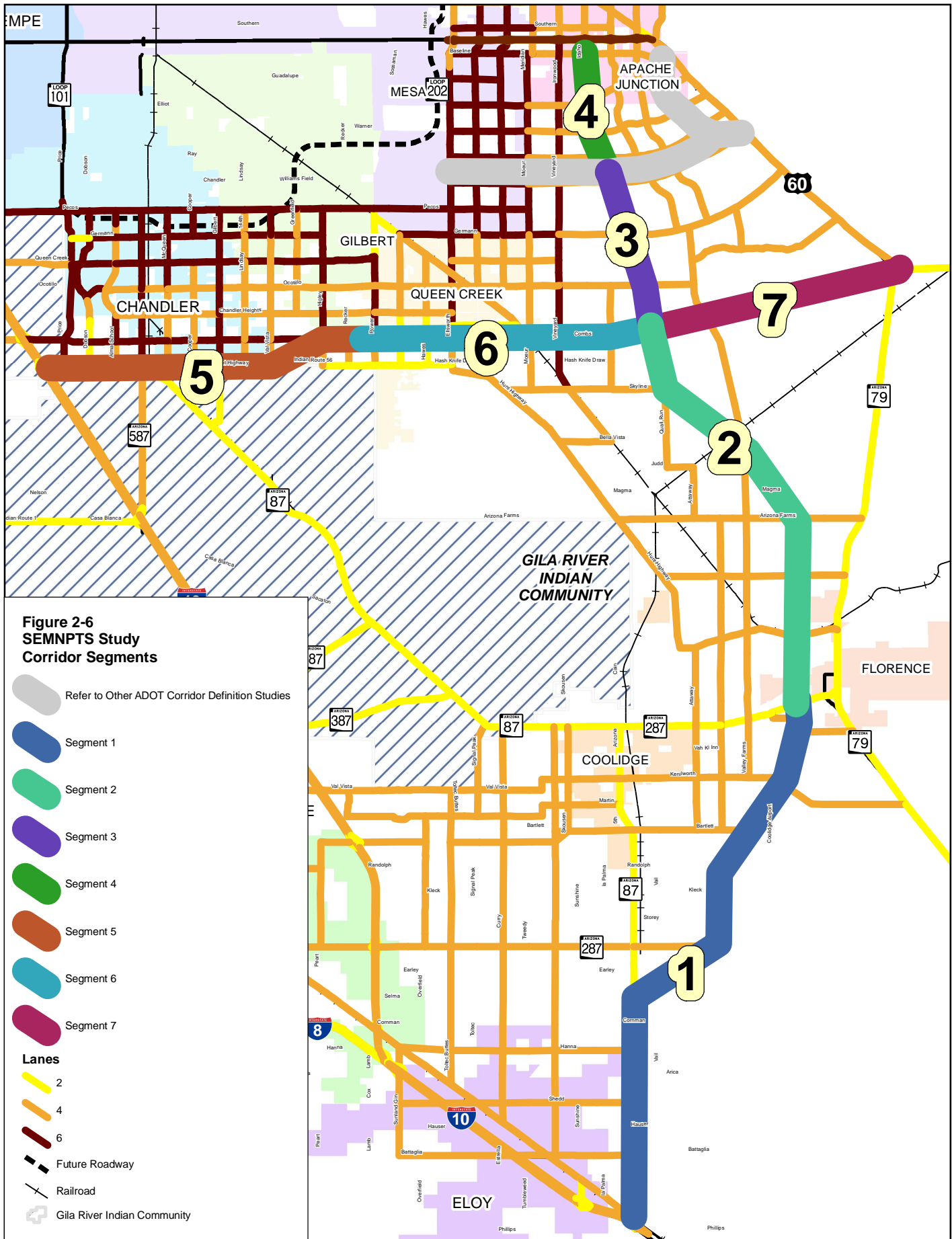
Data Source:
Arizona Land Resource Information System



Kimley-Horn
and Associates, Inc.







**Figure 2-6
SEMNPTS Study
Corridor Segments**

- Refer to Other ADOT Corridor Definition Studies
 - Segment 1
 - Segment 2
 - Segment 3
 - Segment 4
 - Segment 5
 - Segment 6
 - Segment 7
- Lanes**
- 2
 - 4
 - 6
 - Future Roadway
 - Railroad
 - Gila River Indian Community

N

0 1 2 3 4 5 Miles

Data Source:
Arizona Land Resource Information System



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and Associates, Inc.



2.2.1 Needs Analysis Findings for North-South Corridor

The North-South corridor as initially identified by the 2003 Southeast Maricopa/Northern Pinal Transportation Study would provide a high-level, access controlled facility to connect the US 60 near Apache Junction to I-10 near Eloy.

Table 2-3 is a summary of needs analysis findings for each segment of the North-South corridor, and the degree to which 2030 travel on each corridor segment satisfies the required criteria. The needs analysis did not consider future conditions beyond 2030. As described in **Table 2-3**, the following conclusions can be drawn from the needs assessment for the North-South corridor:

- § In the future, major travel movement is forecast between northern Pinal and southeast Maricopa Counties. Residents in Florence, Coolidge, and along the Hunt Highway will require access to employment centers that will be located to the northwest in the Williams Gateway area and in Maricopa County. A need is demonstrated for the North-South corridor as an access controlled multi-lane freeway to accommodate the projected travel demand.
- § A need is demonstrated for the Williams Gateway corridor to be extended eastward into Pinal County until it intersects with the North-South corridor. The connection with the North-South corridor will establish connectivity between the Coolidge/Florence area and the MAG Freeway System, including in the Loop 202.
- § No need is demonstrated for the North-South corridor south of SR 287. The future arterial system will be able to accommodate the projected traffic demand.
- § No need is demonstrated for the North-South corridor north of the Williams Gateway corridor. A local parkway facility can accommodate the projected traffic volumes.
- § Implementation of the North-South corridor does not eliminate congestion issues on the arterial networks, but significantly improves their operations. This is particularly true for north-south arterials.

2.2.2 Needs Analysis Findings for East-West Corridor

The East Valley corridor as initially identified by the 2003 Southeast Maricopa/Northern Pinal Transportation Study would provide a high-level, access controlled facility on the Hunt Highway/Riggs Road alignment along the southern boundary of Maricopa County. The corridor would connect I-10 in Chandler to the US 60 at Florence Junction.

Analysis of the Pinal County Planning Model scenarios reveals that while traffic volumes may justify the need for certain segments of an East-West corridor, other considerations do not demonstrate that an East-West corridor would provide a system-wide benefit. **Table 2-4** contains a summary of the needs analysis findings for each segment of the East-West corridor, and the degree to which 2030 travel on each corridor segment satisfies the required criteria. The needs analysis did not consider future conditions beyond 2030. From the analysis, the following conclusions can be drawn:

- § No need is demonstrated for the East-West corridor along segment 5 between I-10 and Val Vista Road. Traffic volumes may be accommodated by an arterial facility.
- § Traffic volumes on segment 6, between Val Vista Road and the Central Arizona Project Canal, may warrant a freeway-level facility. However, improving segment 6 to a freeway-level facility does not meet other criteria, including:
 - Establishing regional connectivity between population centers. As segment 5 of the East-West corridor does not attract enough volume to warrant a freeway-level

facility, the East-West corridor would not provide continuity with the existing state highway system. In order for the East-West corridor segment to be constructed as a state-owned facility freeway facility, it must serve inter-regional or intra-regional trips, establish connectivity between population centers or regions, or connect other high-capacity state routes.

- Segment 6 of the East-West corridor replicates the arterial system. This segment primarily serves local traffic (e.g. traffic exits the corridor within a very short distance of its entrance). Analysis of this corridor shows that even if this corridor segment was developed as a freeway facility, the condition of parallel arterials would not considerably improve. The absence of a mature arterial network in Gilbert, and Queen Creek creates congestion that is not resolved by the East-West corridor

§ No need is demonstrated for the East-West corridor, as a freeway facility, east of the Town of Queen Creek/Central Arizona Project Canal (segment 7). In the future (beyond 2030), this segment may be considered for development by local jurisdictions as a semi-access controlled parkway or expressway facility.

A summary of the needs analysis findings for the North-South corridor and for the East-West corridor is presented in **Figure 2-7**.

2.2.3 High-Capacity Transit

As seen in the needs analysis, travelers within the study area predominantly desire to travel in a southeast to northwest pattern. Maricopa County communities such as Chandler and Gilbert are expected to provide a large number of concentrated employment opportunities over the next 25 years. However, these communities are also projected to reach build-out conditions and thus requiring employment opportunities to be filled by residents that will commute into these communities.

Residents in Coolidge, Florence, San Tan, and along the Hunt Highway corridor will desire access to employment centers located to the northwest. However, significant geographic constraints (Gila River Indian Community, mountains, and regional parks), as well as continuing development pressures, limit the opportunity for multiple southeast-northwest corridors to accommodate them. As such, local jurisdictions and regional agencies should consider multi-modal alternatives, in conjunction with roadway facilities, within the study area, and particularly along the Hunt Highway corridor.

The Maricopa Association of Governments is already considering expanding high-capacity transit to the southeast valley. The MAG Regional Transportation Plan (funded by Proposition 400 that was approved by voters in 2004) contains \$5 million dollars for the study, planning, and design of high-capacity transit from the Williams Gateway and Queen Creek area and connecting to Gilbert, Mesa, Tempe, and downtown Phoenix. Although the MAG RTP does not allocate funding for high-capacity transit along this corridor until after the year 2025, local and regional jurisdictions recognize that the rapid pace of development may necessitate high-capacity transit alternatives in this area prior to the year 2025.

The availability of existing infrastructure may facilitate the implementation of high-capacity transit within the study area. The Union Pacific railroad line is a single-track facility with segments of double-tracked sidings. Sufficient right-of-way exists for double-tracking this corridor. A double-track facility would not only enhance the freight capacity of a rail corridor between Coolidge, Florence and the Phoenix metropolitan area, but would enable the rail line to be used for high-capacity transit. A high-capacity transit corridor could

alleviate some of the congestion that is anticipated to occur within the study area by the year 2030 by providing an alternative mode of transportation to commuters and travelers. Commuter rail service from Florence with intermediate stops at five to ten mile spacing could address the peak trip needs of communities along the corridor and could reduce pressure on the regional road system.

The potential for high-capacity transit should be addressed in local jurisdictions' planning efforts including the upcoming Small Area Transportation studies to be conducted by Queen Creek, Pinal County, Coolidge, and Florence.

Table 2-3 – Needs Analysis Summary: Apache Junction/Coolidge Corridor

Segment No.	Needs Analysis Criteria			
	Criteria # 1 – Is the 2030 local transportation system overburdened?	Criteria # 2 – Are the corridor segments utilized (Do they ‘load’)?	Criteria # 3 – Do the corridor segments improve arterial operations in the study area without replicating arterials?	Criteria # 4 – Do the corridor segments improve or establish regional connectivity?
1 – I-10 to SR-287	<p>⊖ Local transportation system will be able to accommodate the projected travel demand in the year 2030. Projected traffic volumes on 2030 Base Network range from 6,000 vpd to 25,000 vpd – well within the capacity limits of a 4-lane arterial.</p>	<p>∑ Segment does not attract enough vehicles to warrant a freeway-level facility. The projected traffic volumes south of SR-287 range from less than 4,000 vpd to 18,000 vpd. These are more typical of arterials. Traffic volumes increase on the northern end of the segment, approaching 40,000 vpd at Hunt Highway.</p>	<p>∑ Not applicable, as corridor segment does not meet criteria # 2.</p>	<p>∑ Not applicable, as corridor segment does not meet criteria # 2.</p>
2 – SR-287 to East Valley Corridor / Riggs Road	<p>⊖ The 2030 local transportation system, without significant investment, will not be able to accommodate the projected traffic volumes. North-south and northwest-southeast diagonal arterials are particularly overburdened as residents of Coolidge, Florence, and the Hunt Highway corridor require access to employment centers.</p>	<p>⊖ Traffic volumes increase from 30,000 – 40,000 vpd at Hunt Highway to more than 140,000 vpd.</p>	<p>⊖ Significantly off-loads parallel arterials. Portions of Hunt Highway are reduced in excess of 20,000 vpd. Traffic volumes on Attaway Rd, Felix Rd, and Valley Farms Rd, are reduced by up to 15,000 vpd. SR-79 is off-loaded by nearly 5,000 vpd. Traffic volumes on east-west arterials that connect to and serve the corridor experience increased traffic volumes.</p>	<p>⊖ Segment 2 improves connectivity between the Florence/Coolidge, and the Williams Gateway area. Segment 2 connects to the existing state highway system at SR-79 or alternatively at SR-287</p>
3 – East Valley Corridor / Riggs Road to Williams Gateway Corridor	<p>⊖ Traffic volumes on north-south arterials including Ironwood, Meridian, Ellsworth Road, and Hunt Highway range from 50,000 vpd to 70,000 vpd – beyond the capacity of 4-lane arterials and nearing the upper range for 6-lane arterials. Additional north-south capacity is needed.</p>	<p>⊖ This segment would serve nearly 140,000 vpd – a high-capacity, controlled access corridor is required to accommodate these volumes.</p>	<p>⊖ Segment significantly off-loads parallel north-south arterials. Volumes on Ironwood and Meridian are reduced by up to 30,000 vpd. Un-named future arterials on State Land are reduced by 10,000 – 30,000 vpd.</p>	<p>⊖ Segment enables connectivity to be established between Florence/Hunt Highway corridor and the Williams Gateway area.</p>



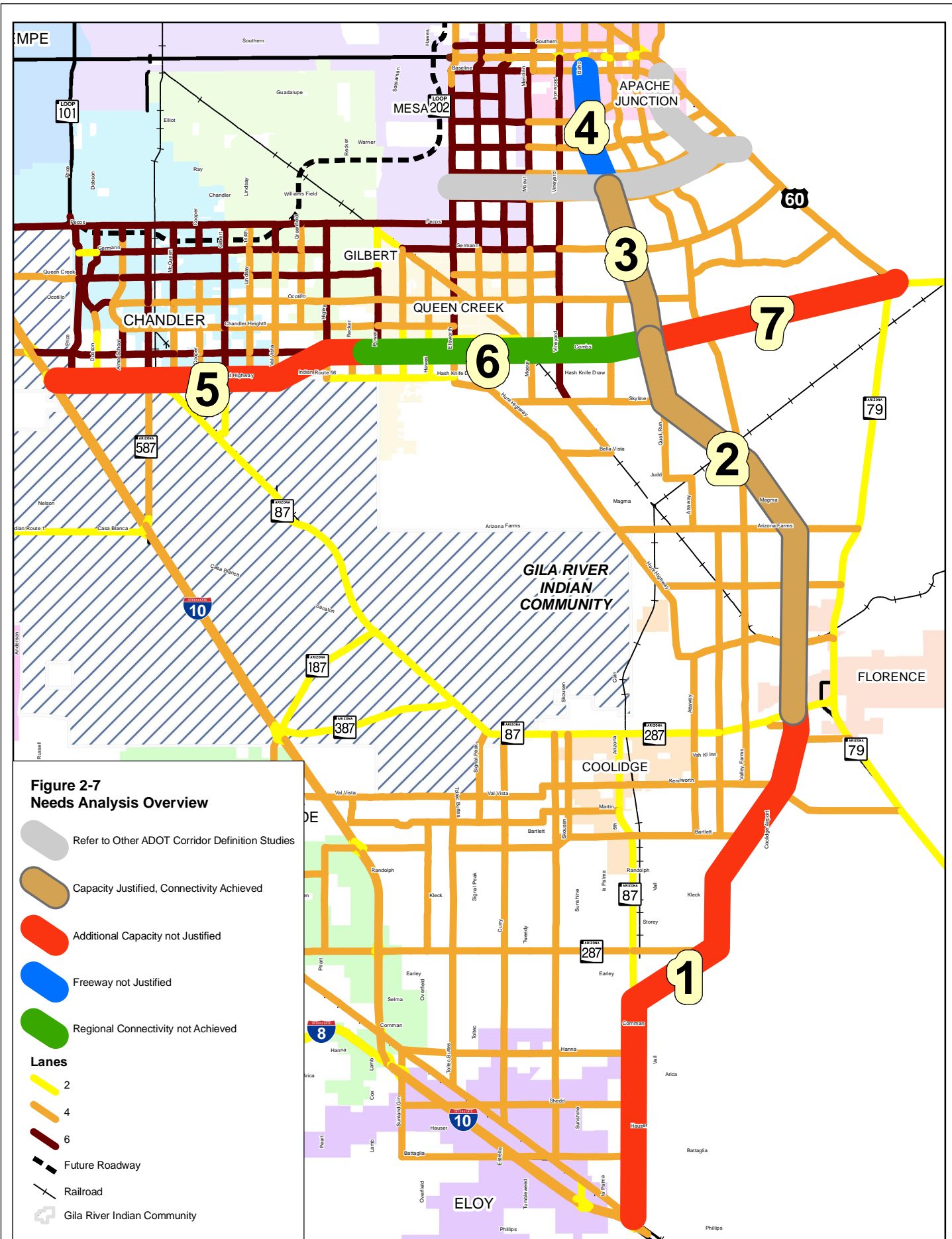
Table 2-3 – Needs Analysis Summary: Apache Junction/Coolidge Corridor (continued)

Segment No.	Needs Analysis Criteria			
	Criteria # 1 – Is the 2030 local transportation system over-burdened?	Criteria # 2 – Are the corridors segments utilized (Do they 'load')?	Criteria # 3 – Do the corridors segments improve arterial operations in the study area without replicating arterials?	Criteria # 4 – Do the corridor segments improve or establish regional connectivity?
4 – Williams Gateway Corridor to US 60	<p>⊖ Traffic volumes on north-south arterials operate at conditions that approach the capacity of the roadways, though volumes on north-south corridors are somewhat less than those that parallel segment 3.</p>	<p>⚗ Traffic volumes on the corridor significantly decrease north of the Williams Gateway freeway. Vehicles utilize the corridor to access the Williams Gateway freeway, and subsequently the MAG Freeway system (e.g. Loop 202.). Traffic volumes south of the Williams Gateway exceed 120,000 vpd; volumes north of the Williams Gateway range from 30,000 – 70,000 vpd.</p>	<p>⊖ Traffic volumes on parallel north-south arterials decrease if the Apache Junction / Coolidge corridor is extended north of the Williams Gateway to the US 60. However, if Idaho Rd is extended south to the Williams Gateway freeway as an arterial facility, in lieu of the Apache Junction corridor, traffic volumes are evenly redistributed to other north-south arterials – each serving approximately 30,000 vpd.</p>	<p>⚗ Not applicable, as corridor segment does not meet criteria # 2.</p>



Table 2-4 – Needs Analysis Summary: East Valley Corridor

Segment No.	Needs Analysis Criteria			
	Criteria # 1 – Is the 2030 local transportation system over-burdened?	Criteria # 2 – Are the corridors segments utilized (Do they 'load')?	Criteria # 3 – Do the corridors segments improve arterial operations in the study area without replicating arterials?	Criteria # 4 – Do the corridor segments improve or establish regional connectivity?
5 – I-10 to Val Vista Road	<p>⊖ Local transportation system operates at near-capacity or over-capacity conditions. Roads that provide access to I-10 (Riggs Road between Price Rd and I-10 Rd) is particularly over-burdened. Volumes on north-south arterials are generally higher than those on east-west arterials.</p>	<p>⊖ East Valley corridor along Hunt Highway, when modeled as a freeway facility, loads to approximately 60,000 to 80,000 vpd.</p>	<p>∩ East Valley corridor replicates the arterial system. Traffic volumes on Riggs Road are shifted to Hunt Highway / East Valley corridor. East Valley corridor provides no significant benefit to east-west arterials north of Riggs Road.</p>	<p>∩ Not applicable, as corridor segment does not meet criteria # 2.</p>
6 – Val Vista Road to Apache Junction / Coolidge corridor	<p>⊖ Local transportation system is significantly distressed. Discontinuity of the arterial grid system because of diagonals (Rittenhouse Rd., railroad, canals), and geographic constraints (mountains) reduce the efficiency of the local arterial system.</p>	<p>⊖ Segment is characterized by discontinuous, localized loading between Val Vista and Vineyard Road. As corridor approaches Apache Junction interchange, volumes significantly decrease. These patterns indicate that the corridor is primarily serving local traffic, and not through trips.</p>	<p>⊖ Traffic volumes on east-west arterials are reduced by up to 10,000 vpd through Queen Creek area. East Valley corridor does not provide noticeable relief to north-south arterials.</p>	<p>∩ Corridor, if implemented in its entirety, may improve connectivity between Queen Creek and I-10. However, as segment 5 does not meet criteria, implementation of segment 6 would not establish regional connectivity.</p>
7 – Apache Junction / Coolidge Corridor – US 60 at Florence Junction	<p>∩ The local transportation system appears to be able to accommodate traffic within the area that desires access from US 60 at Florence Junction to Queen Creek.</p>	<p>∩ East Valley corridor does not attract volumes that warrant a freeway-level facility – projected volumes range from 30,000 to 50,000 vpd.</p>	<p>⊖ Traffic volumes are shifted from adjacent arterials to East Valley corridor. Adjacent arterials operate well below capacity.</p>	<p>⊖ Corridor would improve connectivity between US 60 at Florence Junction and Queen Creek.</p>



**Figure 2-7
Needs Analysis Overview**

- Refer to Other ADOT Corridor Definition Studies
 - Capacity Justified, Connectivity Achieved
 - Additional Capacity not Justified
 - Freeway not Justified
 - Regional Connectivity not Achieved
- Lanes**
- 2
 - 4
 - 6
- Future Roadway
 - Railroad
 - Gila River Indian Community

N

0 1 2 3 4 5 Miles

Data Source:
Arizona Land Resource Information System

2.3 2030 Corridor Concept

The Corridor Concept was developed consistent with the findings presented for the North-South corridor and for the East-West corridor described in **Section 2.2**, and from coordination with study teams for the Williams Gateway corridor and the US 60 corridors.

The Corridor Concept includes a North-South corridor from the Florence north to the Williams Gateway Corridor. The Williams Gateway corridor would then extend westward to ultimately connect with the Loop 202. This combined corridor will significantly improve mobility between the Florence/Coolidge area and southeast Maricopa County. The Corridor Concept is depicted in **Figure 2-8**. Traffic volumes projected for the 2030 Corridor Concept are shown in **Figure 2-9**.

The Corridor Concept includes the following:

- § Six-lane, fully access controlled, North-South freeway facility beginning in Florence and extending north to an intersection with the Williams Gateway freeway. Interchanges will be located at a preferred spacing of 2 miles, with a minimum spacing of 1 mile.
- § Six-lane Williams Gateway freeway facility extending from the connection with the North-South freeway westward to the Pinal County/Maricopa County line and connecting with the MAG Williams Gateway Freeway. The MAG Williams Gateway Freeway then continues west and connects to the Loop 202. For a comprehensive description of the Williams Gateway Corridor, please refer to the *ADOT Williams Gateway Corridor Definition Study*.
- § Six-lane US 60 Re-route. For a comprehensive description of this corridor please refer to the *US 60 Corridor Definition Study*.

As detailed in **Table 2-3**, the Corridor Concept includes two segments of the originally proposed SEMNPTS corridors.

Table 2-5 – Corridor Concept Segment Descriptions

Corridor Segment	Segment Description	Facility Level and Number of Lanes
Apache Junction/Coolidge Corridor (N-S Corridor)		
1	I-10 to SR-287	Not included in Concept. Corridor may be preserved for corridor implementation beyond the year 2030 by local zoning officials.
2	SR-287 to East Valley Corridor	Access controlled, 6 lane freeway facility
3	East Valley Corridor to Williams Gateway	Access controlled, 6 lane freeway facility
4	Williams Gateway to US 60	Not included in Corridor Concept. Local jurisdictions may consider developing corridor as a parkway, semi-access controlled facility.
East Valley Corridor (E-W Corridor)		
5	I-10 to Queen Creek	Not included in Corridor Concept
6	Queen Creek to North/South Corridor	Not included in Corridor Concept. Local jurisdictions may consider developing Riggs Road/Combs Road as a parkway, semi-access controlled facility.
7	North/South Corridor to Florence Junction	Not included in Concept. Corridor may be preserved for corridor implementation beyond the year 2030 by local zoning officials.



Each corridor segment that is included in the Corridor Concept meets the conditions set forth in the needs analysis criteria. Most importantly, the corridors significantly enhance connectivity between the Florence/Coolidge area, the Williams Gateway area, and the Loop 202, thereby providing relief to an over-burdened local arterial network.

2.4 2030 Corridor Concept (Plus State Highway Improvements)

The Corridor Concept (Plus Improvements to State Highways) is depicted in **Figure 2-10**. Traffic volumes projected for the 2030 Corridor Concept are shown in **Figure 2-11**.

Analysis of the scenarios shows that improving the non-interstate state highway system yield some additional relief to the regional transportation system. The additional benefits gained by expanding the non-interstate state highway system are expanded upon in **Section 2.5**

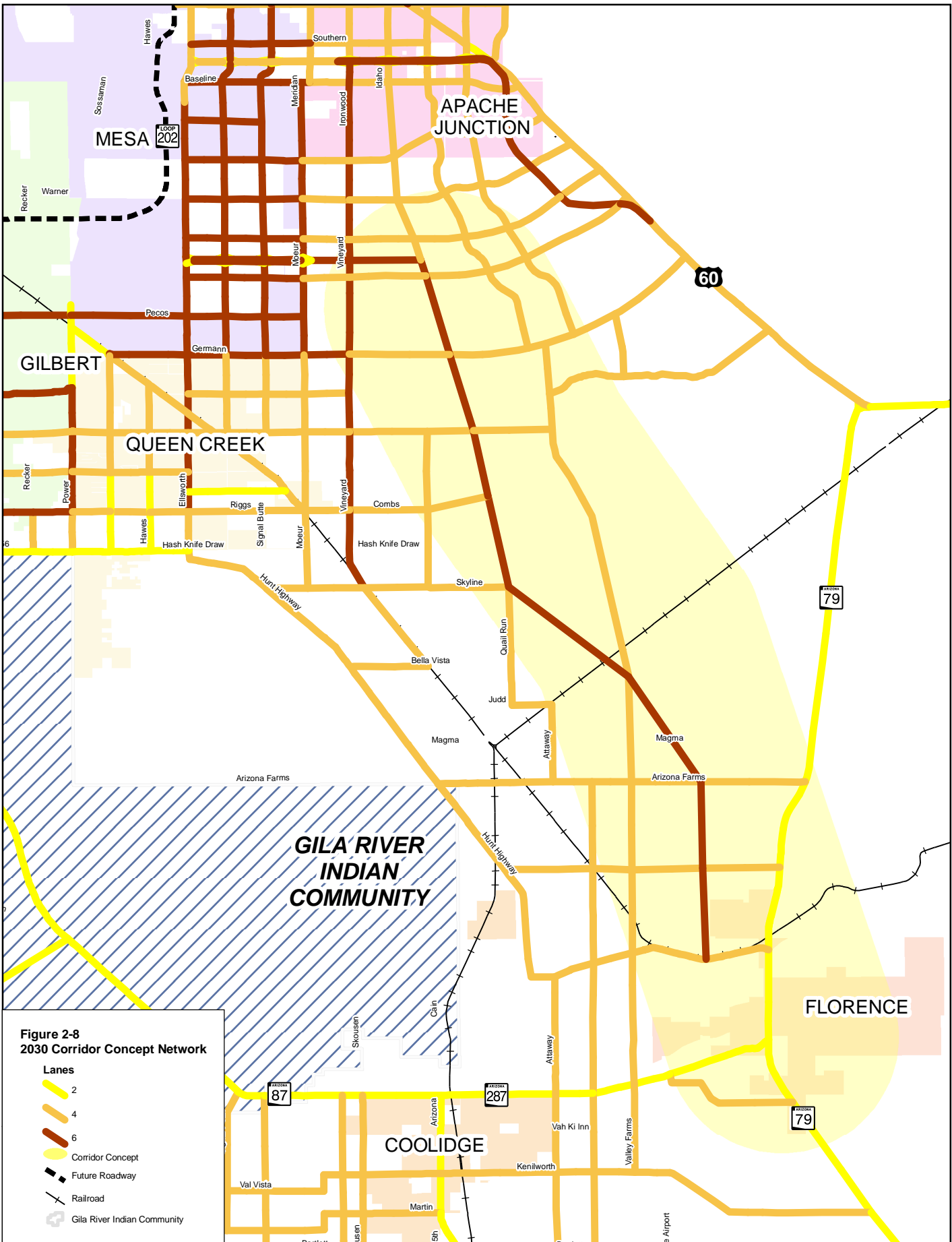
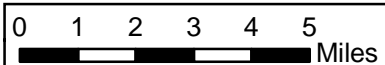


Figure 2-8
2030 Corridor Concept Network

- Lanes**
- 2
 - 4
 - 6

- Corridor Concept
- Future Roadway
- Railroad
- Gila River Indian Community

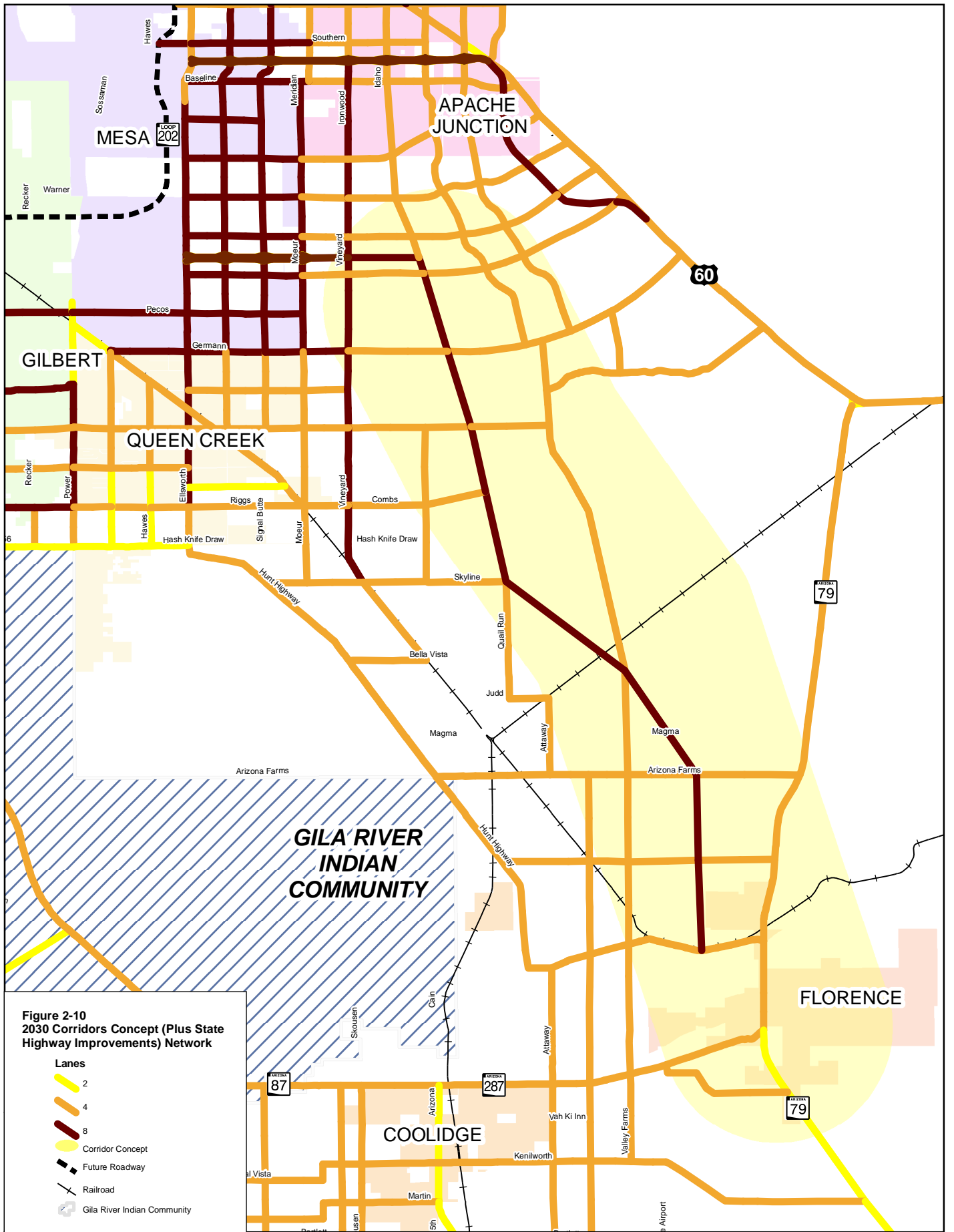


Data Source:
 Arizona Land Resource Information System



Kimley-Horn
 and Associates, Inc.





**Figure 2-10
2030 Corridors Concept (Plus State
Highway Improvements) Network**

Lanes

2

4

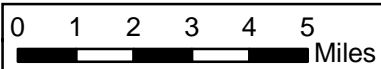
8

Corridor Concept

Future Roadway

Railroad

Gila River Indian Community



Data Source:
Arizona Land Resource Information System



PINAL COUNTY CORRIDORS DEFINITION STUDY



Kimley-Horn
and Associates, Inc.



Note: volumes depicted for
MAG Williams Gateway
Freeway are one way link volumes

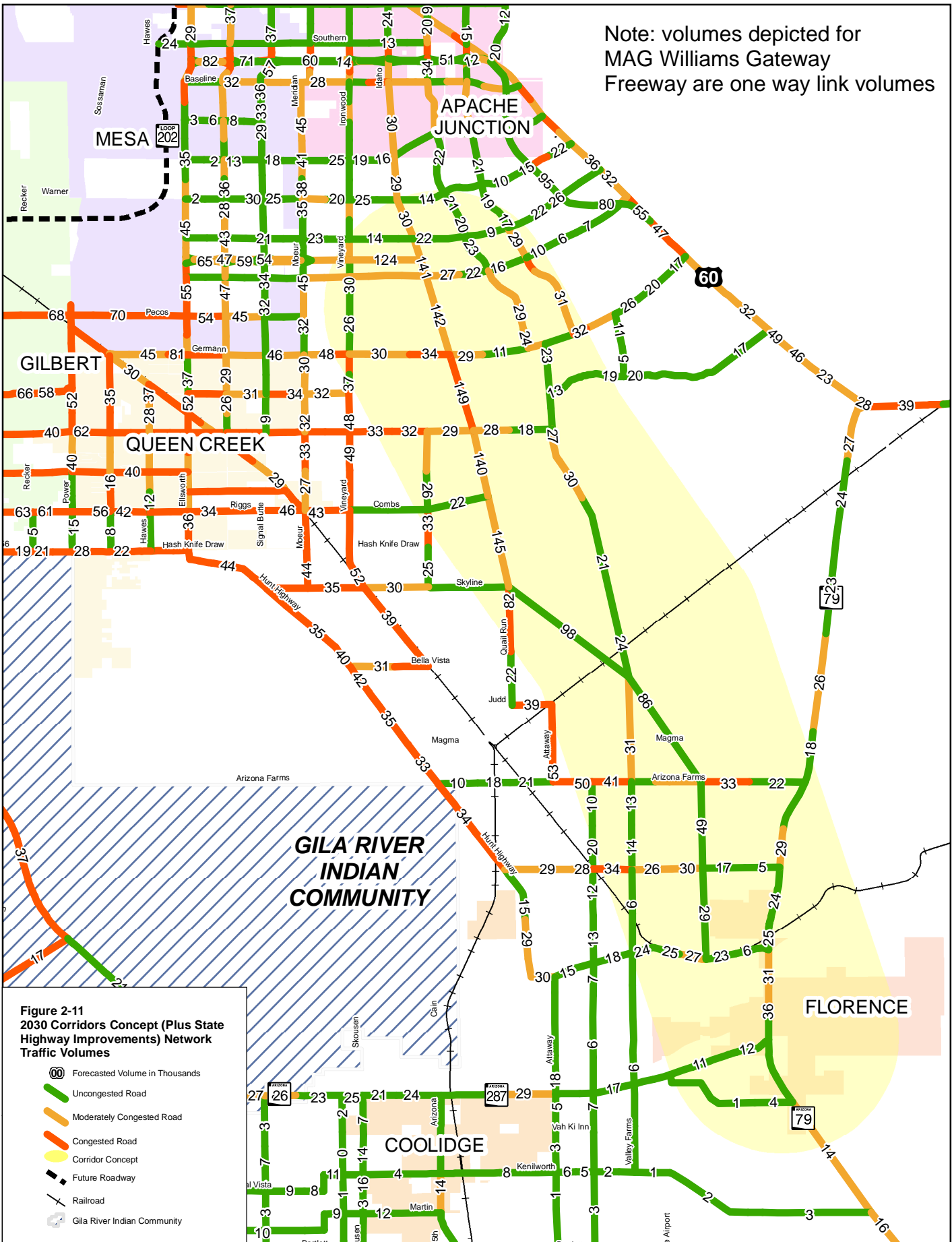
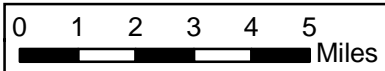


Figure 2-11
2030 Corridors Concept (Plus State
Highway Improvements) Network
Traffic Volumes

- Forecasted Volume in Thousands
- Uncongested Road
- Moderately Congested Road
- Congested Road
- Corridor Concept
- Future Roadway
- Railroad
- Gila River Indian Community



Data Source:
Arizona Land Resource Information System



Kimley-Horn
and Associates, Inc.





2.5 Regional Traffic Performance

Each network scenario described in **Section 2.1** was evaluated using a common set of performance measures that are linked to key planning factors established by the ADOT's MoveAZ long-range transportation plan. The factors evaluated as part of this process include mobility, accessibility, safety, resource conservation and environmental justice². The results of the evaluation for mobility, accessibility, safety, and resource conservation are summarized in **Section 2.5.1** through **2.5.5**. The reader is referred to the *Corridor Definition Study Performance Analysis* document for a more detailed review of each of these measures including environmental justice analysis. This document is contained in the Appendix to this report.

The results of the performance analysis are used to support the overall analysis of corridors alternatives. The performance analysis presented here is one piece of the overall process, and need to be evaluated in context with other information generated for these studies including:

- § The demand for the proposed corridors;
- § The impact of the proposed corridors on the congestion of the arterial network, and the existing state transportation system.
- § The feasibility of implementing a particular corridor based on considerations of physical and engineering criteria, social and environmental criteria, and land use compatibility, and jurisdictional, stakeholder, and public inputs (which are presented in Chapter 3 of this Working Paper); and
- § The system performance and congestion benefits of a new corridor relative to the cost to develop that corridor.

The results presented in this performance analysis are not intended to stand alone. The identification of a recommended corridor concept will utilize this system performance information in concert with the above noted information.

2.5.1 Mobility

The following three key measures are used to estimate mobility:

- § **Vehicle miles of travel (VMT)** provides a system-level estimate of total travel on the system. Increases in VMT above the base future scenario reflect latent demand that is not satisfied with the expected future transportation network.
- § **Vehicle hours of travel (VHT)** provides a system-level estimate of the total time spent traveling on the roadway network. The relative change in VHT and VMT compared to the base scenario represents travel time savings provided by new investments.
- § **Percent of miles** in congested condition provides an assessment of the level of congestion experienced on the roadway network. This measure is captured at two levels. The first level is the percent of highway miles that have a vehicle to capacity ratio over 1 (indicating that the number of vehicles attempting to use the road exceeds the capacity). The second level is the percent of highway miles that have a vehicle to capacity ratio over 1.5. This latter condition can be thought of as roads that are highly congested.

Results of the mobility performance assessment are presented in **Table 2-6**.

² Corridor Definition Study Performance Analysis, Cambridge Systematics, Inc. August 2005

Table 2-6 – Mobility Performance Measures by Scenario

Network Scenario	Total VMT	VMT Deviation from Base	Total VHT	VHT Deviation from Base	Percent of Network Congested	Percent of Network Very Congested
Base Future	32,113,122		4,551,023		41%	7.9%
Enhanced Future	31,619,784	-1.54%	3,261,492	-28.33%	32.2%	3.0%
SEMNPPTS Corridors	32,973,195	2.68%	2,682,051	-41.07%	26.1%	2.1%
Refined All Corridors	32,955,369	2.62%	2,497,108	-45.13%	24.4%	1.7%
Corridor Concept	32,438,746	1.01%	3,207,121	-29.53%	29.2%	3.5%
Corridor Concept Plus	32,252,439	0.43%	2,994,424	-34.20%	27.9%	2.8%

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The performance assessment indicates that vehicles miles of travel (VMT) grow slightly over the base future scenario for all scenarios, except enhanced future. This growth, ranging between one-half of a percent and about 2.5 percent, represents additional latent demand that is not be satisfied by the base future case. The decline in VMT for the enhanced future of 1.5 percent suggests that trips are more direct in this scenario, but that the additional capacity does not provide improved mobility for the latent demand.

For all scenarios, vehicle hours of travel decline significantly, representing improved travel conditions and the use of shorter travel paths for some trips. The decline in hours of travel is lowest for the Enhanced Future scenario (just under 30 percent) and greatest for the SEMNPPTS Corridors scenario (about 45 percent). The Corridor Concept scenario provides just slightly more benefit than the enhanced future, in part due to the additional demand attracted to these new facilities. The Corridor Concept Plus scenario shows much greater benefits, as a number of congested state routes (such as SR 87 through the Gila River Indian Community) are widened to four lanes in this scenario.

Overall congestion declines in each of the scenarios and mileage that is very congested improves significantly. Total congested mileage declines from about 40 percent of all roadway miles in the Base Future scenario to between 25 and 30 percent, depending on the scenario. Again, the SEMNPPTS scenario provides the greatest benefit, with the Corridor Concept Plus providing close to the same benefit (within 3 percent). Roadways that are very congested are reduced by over 50 percent in all scenarios (from almost 8 percent to between 1.5 and 3.5 percent).

2.5.2 Accessibility

For this analysis, accessibility captures the ease of access to key activity centers. An indication of regional accessibility is the accessibility to key activity centers in the region such as employment centers, regional shopping centers, airports, and other regionally critical activities. **Figure 2-12** illustrates the distribution of the activity throughout the PCPM model area and identifies five activity centers that were chosen for this analysis: Apache Junction, Chandler, the Williams Gateway Airport, Coolidge, and Casa Grande.

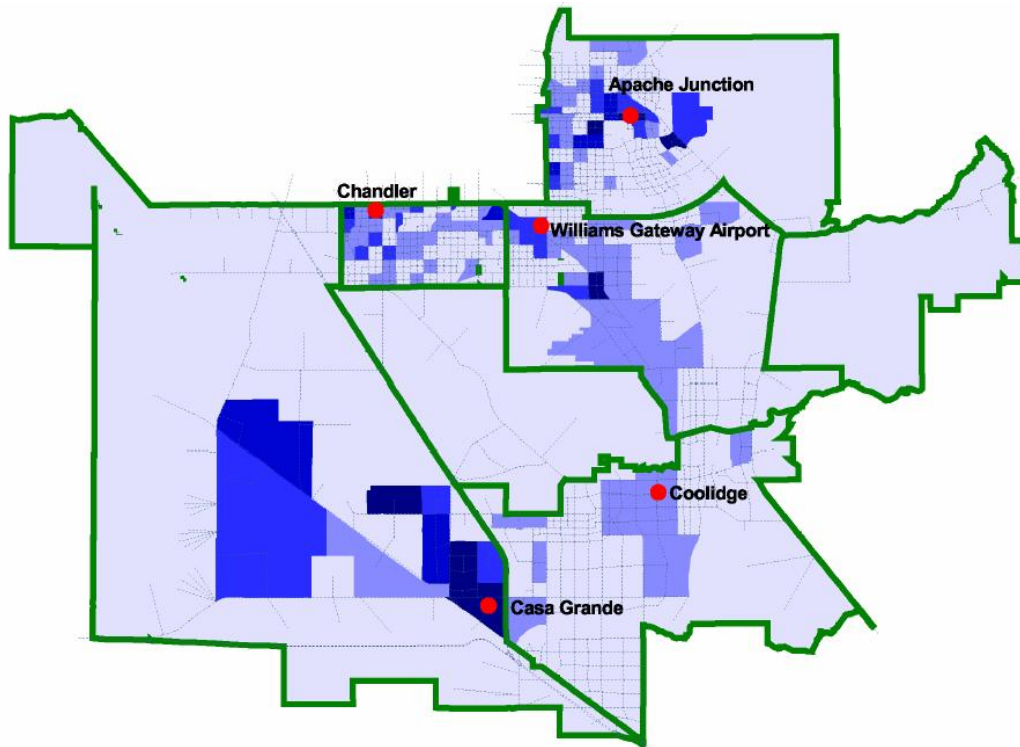


Figure 2-12 – Distribution of Activity and Selected Activity Centers

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

Accessibility is presented in two ways:

- § Color gradient maps are used to present a geographic representation of the travel time to reach the specific activity centers identified above. These illustrate the amount of time it takes to travel to a zone containing a key activity center, using 15-minute increment bands.
- § Trips within travel time bands are also presented for each activity center to understand what percent of total traffic can access each activity center within the travel time bands. The travel time for each trip to the activity center zone is calculated based on the predicted volumes on roadways in the study area and partitioned into the travel time bands. Total trips are presented for zones within a band and the activity center.

The proposed scenarios provided increased accessibility for the major activity centers identified above. **Figure 2-13** presents the portion of study area zones that can access the Williams Gateway activity center within 30 minutes. Results are provided for each of three scenarios: 1) Base Future, 2) SEMNPTS, and 3) Corridor Concept. Zones that are within the bands can be accessed within 30 minutes. Similar results have been developed for 15-minute and 45-minute bands.

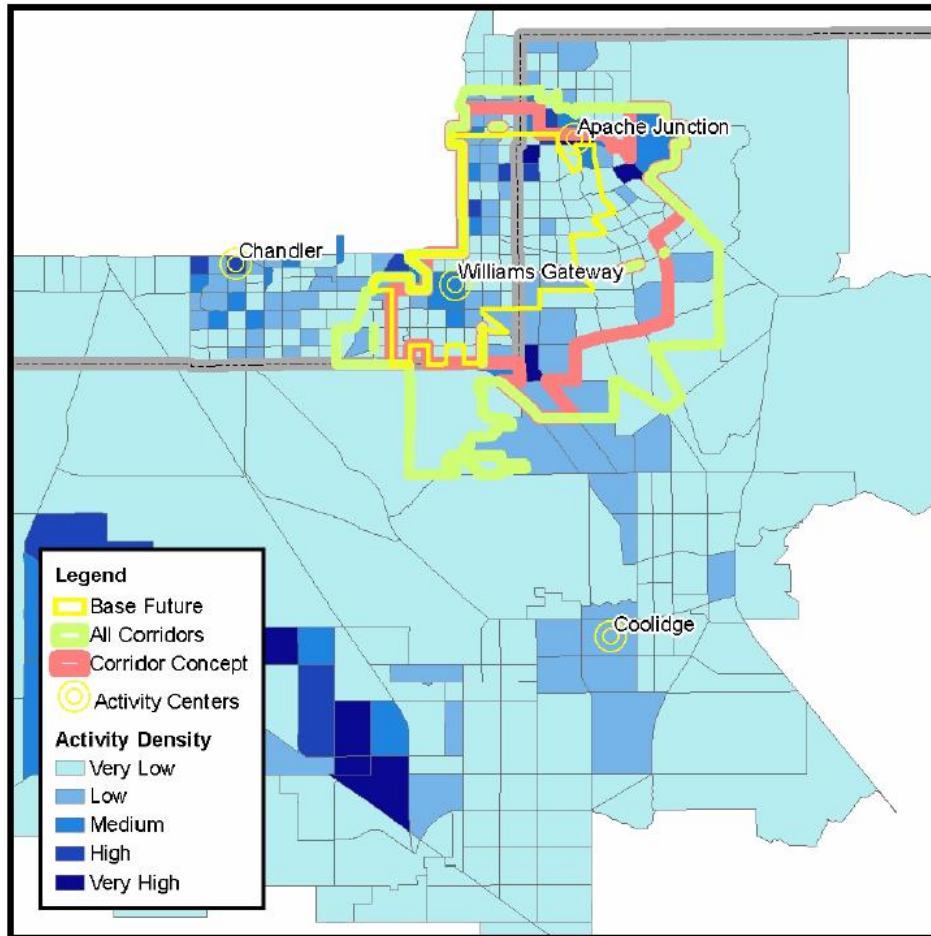


Figure 2-13 – 30-Minute Accessibility Bands by Scenario (Williams Gateway)
Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

Overall, both the SEMNPTS and Corridor Concept provide improved access to the Williams Gateway activity center. Most of the improved access is on the eastern part of the study area, with the SEMNPTS scenario providing some additional access to the west and south.

Figure 2-14 presents the same information for the for the Apache Junction activity center. For this activity center, both the Corridor Concept and the SEMNPTS Corridors scenarios provide additional access. Again, the SEMNPTS Corridors scenario provides additional access to the west and south, but relatively less than for the Williams Gateway activity center.

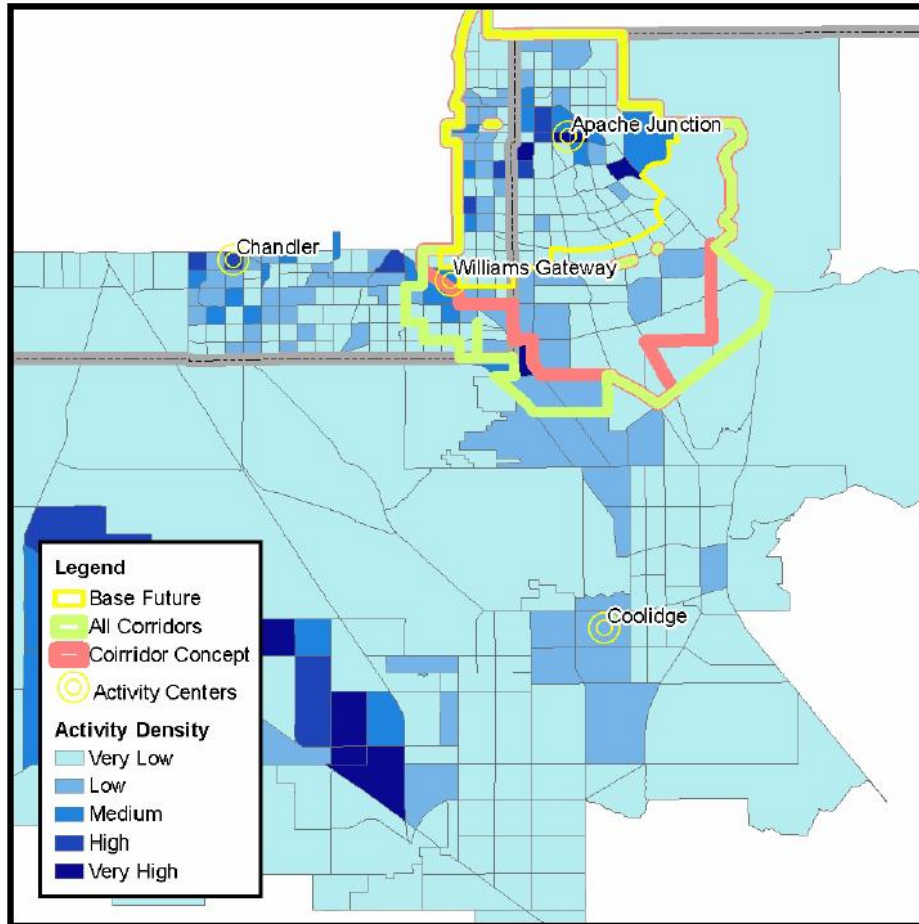


Figure 2-14 – 30-Minute Accessibility Bands by Scenario (Apache Junction)

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The other three activity centers show no real differences among the scenarios in the number of zones that can access the activity centers within 30 minutes.

By examining accessibility at a trip-based level, the impact of each zone becomes clearer. For example, a small zone that produces a large number of trips will be relatively more significant than a small zone that produces few. Also, the number of trips generated by a zone between scenarios may change even if it remains in the same travel time band. Analysis of travel times with respect to the base case shows significant improvement across all activity centers and scenarios. For almost all activity centers, the majority of trips fall within the zero to 15-minute band, and almost none originate outside of the 45- minute band (**Table 2-7**).



Table 2-7 – Trips within 15-Minute Time Band for Each Activity Center and Scenario

Network Scenario	Apache Junction	Chandler	Williams Gateway	Coolidge
Base Future	50.1%	58.3%	27.9%	73.5%
Enhanced Future	55.2%	63.0%	28.7%	82.7%
SEMNPTS (All Corridors)	77.9%	61.2%	47.1%	83.1%
Corridor Concept	73.6%	60.7%	30.3%	81.9%
Corridor Concept Plus	73.6%	60.7%	31.0%	83.0%

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

2.5.3 Safety

Safety is measured using total crashes by type (fatality, injury, and property damage crashes). Analysis breaks this figure into subcategories – fatality, injury, and property damage-only (PDO) crashes – using predetermined ratios dependant on the network. Crash statistics are presented per million vehicle miles traveled. Findings are presented in **Table 2-8**.

Table 2-8 – Safety Performance Measures by Scenario

Network Scenario	Crashes per Million VMT				Total Crashes – Deviation from Base
	Fatalities	Injuries	Property Damage	Total Crashes	
Base Future	.483	46.202	66.498	113.182	
Enhanced Future	.480	45.813	66.068	112.362	-0.73%
SEMNPTS Corridors	.437	41.380	59.074	100.891	-10.86%
Refined All Corridors	.446	42.230	60.409	103.084	-8.92%
Corridor Concept	.456	43.267	62.051	105.774	-6.55%
Corridor Concept Plus	.456	43.214	61.987	105.656	-6.65%

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

The safety analysis findings show that the three corridor scenarios which increase the miles of freeways in the study area (SEMNPTS Corridors, Corridors Concept, and Corridors Concept Plus) have the greatest impact on decreasing accident rates on a system wide level, ranging from 6.5 to almost 9 percent. The change in the Enhanced Future scenario is negligible. For total crashes, the SEMNPTS Corridors scenario which has the greatest number of freeway mileage has the greatest impact with a decrease in total crashes of nearly 9 percent. The difference between Corridor Concept and Corridor Concept Plus proposals on a system wide level is insignificant.

Examining the type of incident, most of the additional benefit realized as part of the SEMNPTS Corridors scenario (over the Corridor Concept and Corridor Concept Plus scenarios) is in property damage crashes. Fatalities and injuries are each only about two percent lower in the SEMNPTS Corridors Scenario. Additional details on the safety analysis

are contained in the Corridor Definition Study Performance Analysis, August 2005 which is provided as an Appendix to this report.

2.5.4 Resource Conservation

The following two performance measures were used to estimate the resource conservation factor:

- § Fuel consumption provides a measure of resource use that varies with traffic volumes and congestion levels. Extreme congestion (stop-and-go traffic) leads to high levels of fuel consumption. However, the relationship between fuel consumption and travel speeds is not linear. A completely free-flow travel network will have higher fuel consumption than a moderately congested network. Fuel consumption rates were derived from FHWA's Intelligent Transportation Deployment Analysis Software (IDAS).
- § Emissions provide an estimate of the environmental impact of the level of use of the transportation system. Emissions are estimated using the tonnage of key pollutants emitted due to travel on the roadway network. Specific pollutants included in analysis are nitrous oxides (NO_x), hydrocarbons (HC), and carbon monoxide (CO). Travel speeds have similar impacts on this performance measure as they do on fuel consumption. Emissions rates were also derived from IDAS for this analysis.

Each of the scenarios leads to a decrease in fuel consumption and the production of emissions relative to the Base Future scenario (**Table 2-9**). This suggests that the various alternatives are moving the network from high levels of congestion to moderate or acceptable levels of congestion. For both fuel consumption and emissions, the SEMNPTS Corridors and Corridor Concept Plus scenarios have the greatest impact. The Enhanced Future and Corridor Concept scenarios show similar improvements to both fuel consumption and emissions, each three to four percent lower than the SEMNPTS and Corridor Concept Plus scenarios. Additional details on resource conservation are contained in the Corridor Definition Study Performance Analysis, August 2005 which is provided as an Appendix to this report.

Table 2-9 – Resource Conservation Performance Measures by Scenario

Network Scenario	Deviation from Base Scenario	
	Fuel Consumption	Emissions
Enhanced Future	-17.1%	-12.8%
SEMNPTS Corridors	-15.3%	-15.5%
Refined All Corridors	-20.8%	-17.6%
Corridor Concept	-15.0%	-12.7%
Corridor Concept Plus	-20.8%	-16.1%

Source: Cambridge Systematics, Corridor Definition Study Performance Analysis, August 2005

2.5.5 Environmental Justice

For a summary of the environmental justice analysis, the reader is referred to *Corridor Definition Study Performance Analysis* document prepared by Cambridge Systematics, Inc, August 2005.

3. CORRIDORS FEASIBILITY ANALYSIS

The corridors feasibility analysis includes an assessment of engineering, social and environmental, land-use compatibility opportunities and constraints, and public and jurisdictional perspectives that would facilitate or prohibit future development of the Corridor Concept introduced in **Section 2.3**. Corridor definition alternatives with significant engineering, environmental, or land-use compatibility issues will not be included in the final corridor definition recommendation.

The general location for new freeway corridors is depicted by the Corridor Concept in **Figure 2-6**. The land area generally represented by the Corridor Concept serves as the starting point for the feasibility analysis. The feasibility analysis process will refine and narrow, to the extent feasible, the Corridor Concept for the North-South corridor into a more specific corridor definition. The narrowing of the North-South Corridor Concept is accomplished by identifying opportunities and constraints that may significantly impact the future alignment of a new freeway corridor. This chapter contains the following sections:

- § **Section 3.1:** describes the feasibility analysis criteria.
- § **Section 3.2:** describes the development of the North-South corridor definition alternatives that are considered in the feasibility analysis.
- § **Section 3.3:** summarizes engineering opportunities and constraints.
- § **Section 3.4:** summarizes social and environmental considerations.
- § **Section 3.5:** summarizes land-use opportunities and constraints.

Information is presented in the above named sections for the North-South corridor only. The feasibility analyses for the Williams Gateway corridor and the US 60 reroute are contained in *Working Paper No. 2* that was developed for each of the Corridor Definition Studies. These reports are available at: <http://tpd.azdot.gov/planning/corridorstudies.php>.

3.1 Evaluation Criteria

The feasibility evaluation is comprised of four major components. These are physical and engineering, social and environmental, land use compatibility, and jurisdictional, stakeholder, and public perspectives.

3.1.1 *Physical and Engineering Criteria*

Physical and engineering features include road-way conditions and structures, right-of-way, topography, geological characteristics, major drainage features, and major utilities within the study area. The outcome of this feasibility analysis will be the determination of challenges, issues, and opportunities associated with corridor development and construction.

3.1.2 *Social and Environmental Criteria*

The purpose of the social and environmental analysis is to identify and describe existing environmental conditions within the study area. While potential environmental concerns for future corridor development are identified, the analysis is not intended to meet the requirements of the National Environmental Policy Act (NEPA).

The environmental analysis reviews the socioeconomic environment, physical and natural environmental character, cultural resources, and section 4(f) resources of the Transportation

Act in the study area. Environmental considerations, issues, and sensitive areas are identified. In addition, the environmental feasibility addresses the surveying, permitting, and agency coordination requirements that would need to be addressed in future studies prepared in accordance with NEPA.

3.1.3 *Land-use Compatibility Criteria*

Land use compatibility criteria include issues of corridor compatibility with jurisdictional development and local land use plans. An outcome of this analysis is how the Corridor Concept alternatives fit with adopted transportation and land use plans and if incompatibilities are identified, how adopted transportation and land use plans must be modified to accommodate the corridors.

3.1.4 *Jurisdictional, Stakeholder, and Public Perspectives*

Jurisdictional input was received through input received from the Technical Advisory Committee and from two rounds of meetings held with each jurisdiction in the study area that were held in January and July, 2005. Public perspectives input was received through two rounds of open houses held in April and August 2005, and from several meetings and briefings of local elected officials.

3.2 North-South Corridor Definition Development

This section discusses the development of the corridor definition for the North-South Corridor Concept. The development of this corridor definition considered three principal inputs: (1) existing corridor conditions, (2) future corridor conditions, and (3) jurisdictional, stakeholder, and public perspectives.

3.2.1 *Review of Existing and Future Study Area Conditions*

Analysis of the Base Future 2030 Network, 2030 Enhanced Future Network, the 2030 SEMNPTS Corridors Network, and the Corridor Concept Network all demonstrate a dominant travel pattern – travelers desire mobility between the southeast (Coolidge/Florence) and the northwest (Maricopa County). Indicative of this travel pattern southeast/northwest directional arterials and state highways (i.e., Hunt Highway, SR-87, I-10) are all projected to operate at or above capacity.

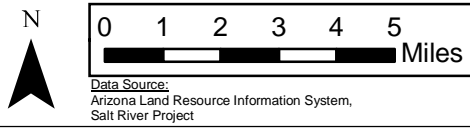
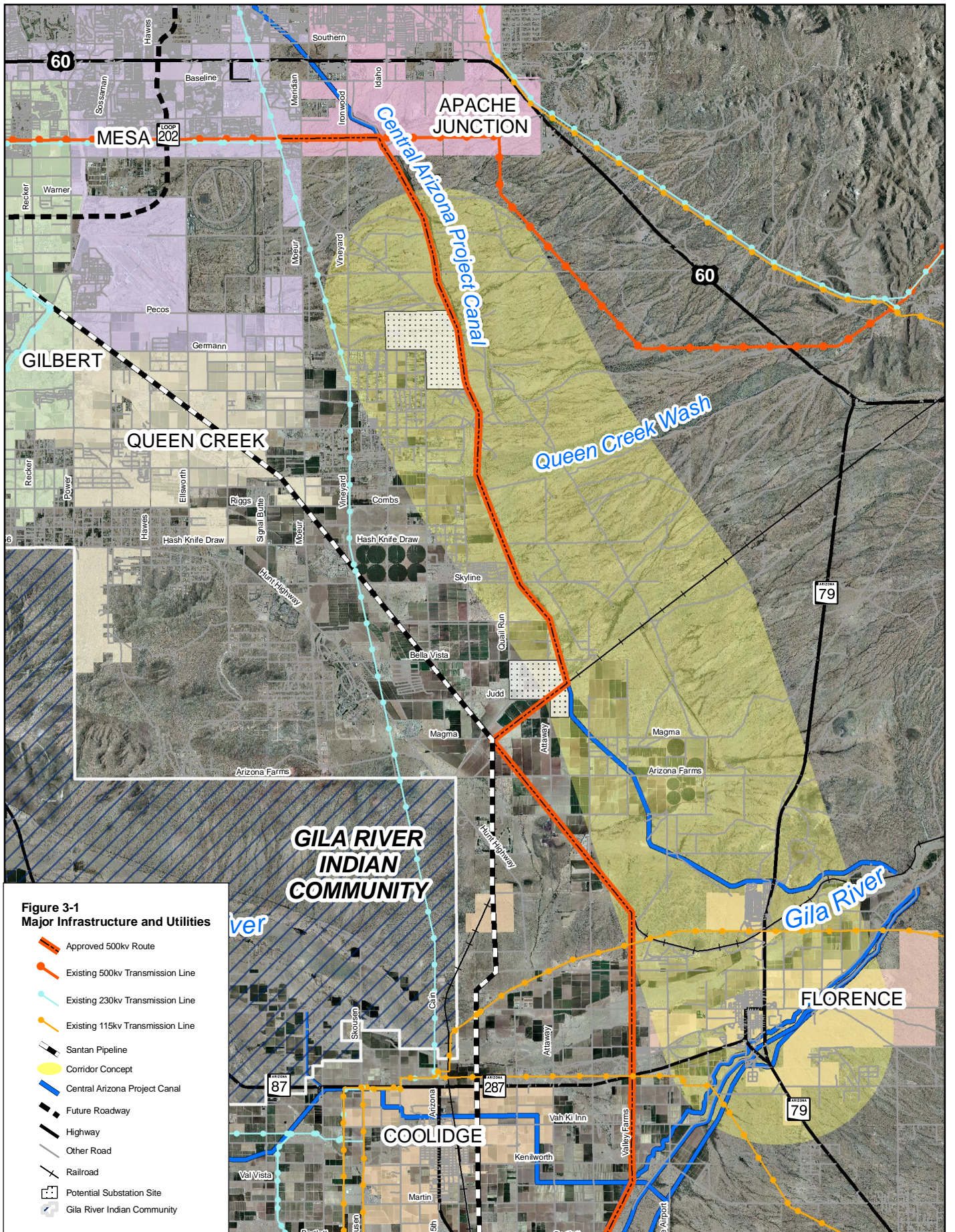
Development patterns and land use within the study area have in large part been influenced, and will continue to be influenced, by existing man-made features and geographic constraints. These man-made features include the CAP canal, which enters the study area from Mesa in the northwest near Southern Avenue, extends in a south-southeasterly direction, and exits the study area north of the Town of Florence, the Union Pacific Railroad which crosses through the southern portion of the study area and the Magma Arizona Railroad which crosses through the central portion of the study area. These and other existing and future man-made features are depicted in **Figure 3-1, Major Infrastructure and Utilities**.

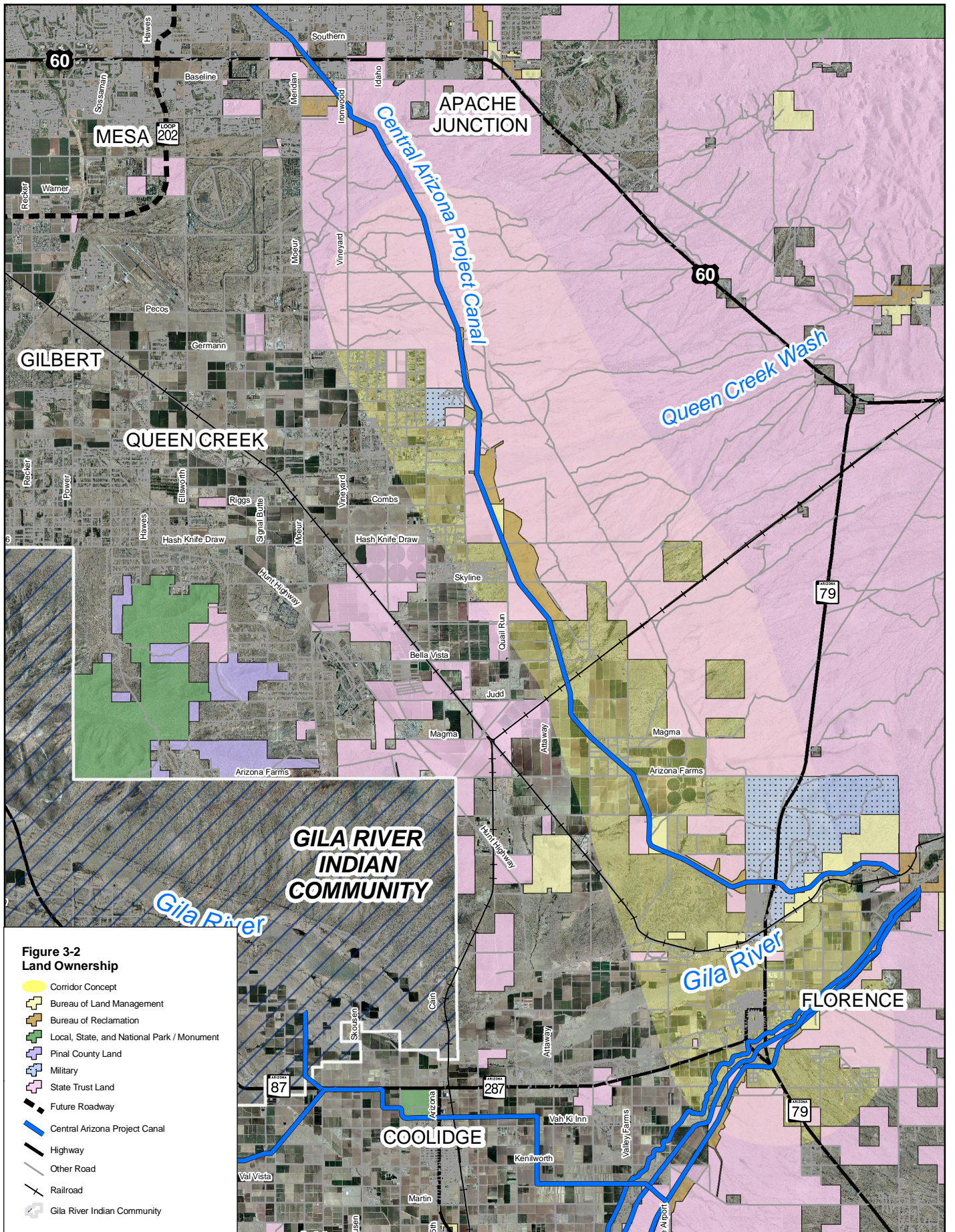
North and east of the Town of Queen Creek, the land is largely owned by the State of Arizona as depicted by **Figure 3-2, Land ownership**. Ironwood Road/Vineyard Road is the only major continuous roadway providing north-south mobility through this area. It should be noted that Pinal County is currently improving Ironwood Road from two lanes to four lanes and has plans for improvements to other north-south roadways.



Agricultural lands compose the southern and western portions of the study area with scattered residences throughout. The intensity of development and land use increases towards the northern and central portions of the study area particularly between Coolidge, Florence and Queen Creek. As seen in **Figure 3-3**, *Existing and Future Master Planned Communities*, development is particularly concentrated between Florence and Queen Creek along the Hunt Highway corridor. Local jurisdictions, including Coolidge, Florence, Queen Creek, and Pinal County have approved developments containing thousands of homes. Many of these developments are currently under construction.

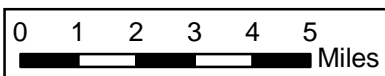
The study area is located within the Basin and Range Physiographic Province of central Arizona. This province is composed of broad areas of alluvial fans and fan terraces, separated by isolated desert mountains. The valley areas consist of depressions filled with alluvial deposits of sand, gravel, silt, and clay commonly in excess of 1,000 feet. Some of these valleys were at times covered by lakes during wetter periods. The majority of the study area is relatively flat, (**Figure 3-4**) with an average elevation of approximately 1,200 feet above mean sea level. No permanent natural water sources exist within the study area; however, small irrigation canals feeding the agricultural lands occur in the western portion of the study area, and numerous ephemeral washes dissect the entire study area.





**Figure 3-2
Land Ownership**

- Corridor Concept
- Bureau of Land Management
- Bureau of Reclamation
- Local, State, and National Park / Monument
- Pinal County Land
- Military
- State Trust Land
- Future Roadway
- Central Arizona Project Canal
- Highway
- Other Road
- Railroad
- Gila River Indian Community

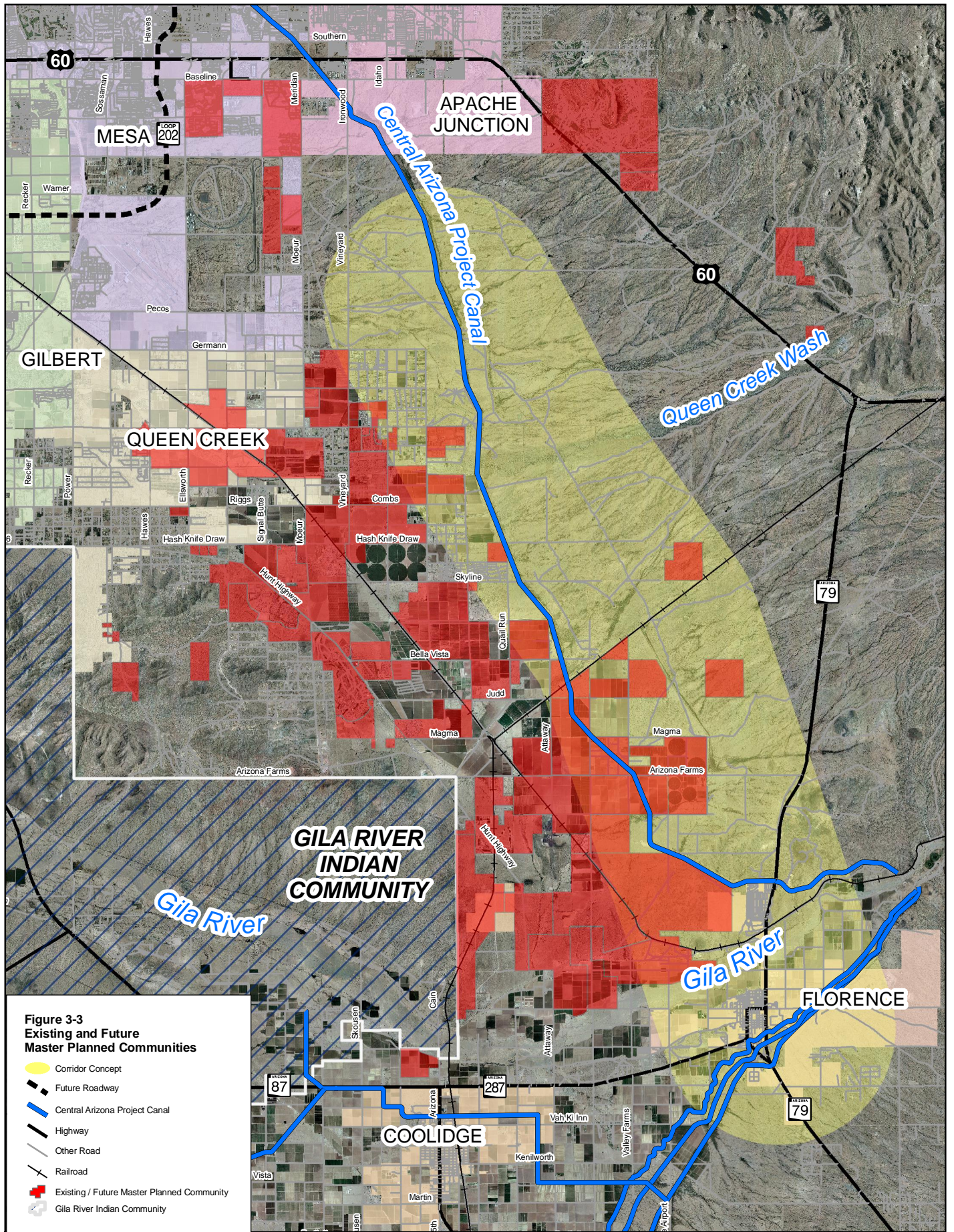


Data Source:
Arizona Land Resource Information System



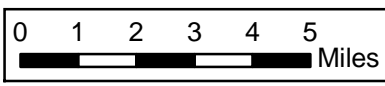
Kimley-Horn
and Associates, Inc.





**Figure 3-3
Existing and Future
Master Planned Communities**

- Corridor Concept
- Future Roadway
- Central Arizona Project Canal
- Highway
- Other Road
- + Railroad
- Existing / Future Master Planned Community
- Gila River Indian Community

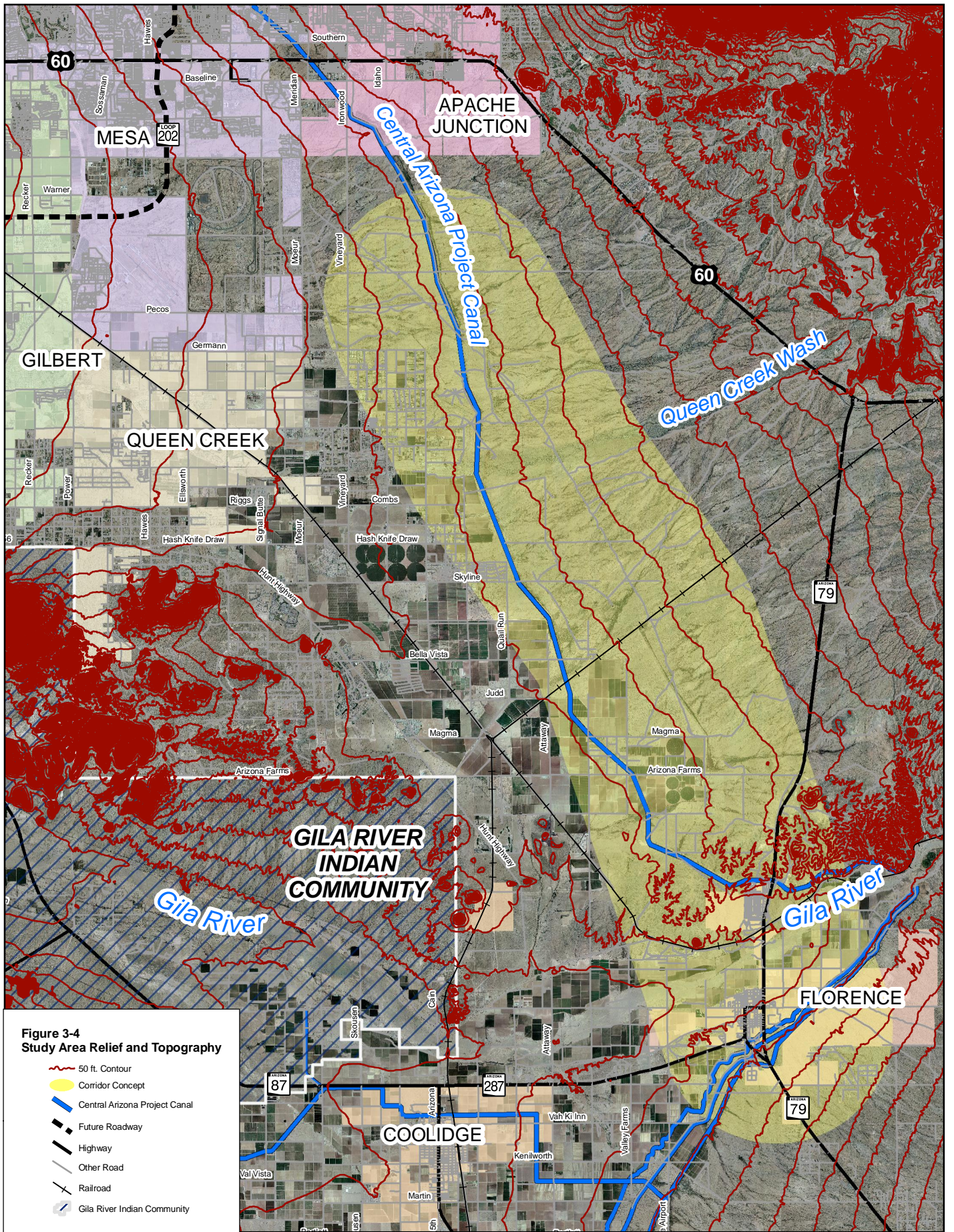


Data Source:
Arizona Land Resource Information System



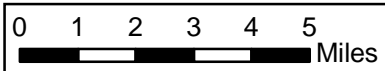
Kimley-Horn
and Associates, Inc.





**Figure 3-4
Study Area Relief and Topography**

- 50 ft. Contour
- Corridor Concept
- Central Arizona Project Canal
- Future Roadway
- Highway
- Other Road
- Railroad
- Gila River Indian Community



Data Source:
Arizona Land Resource Information System



Kimley-Horn
and Associates, Inc.





3.2.2 Jurisdictional, Stakeholder, and Public Perspectives

Jurisdictional, stakeholder, and public perspectives are critical to the alternatives development process. In order to garner stakeholder and jurisdictional input into the corridor alternatives development process, the study team met with each jurisdiction on the Technical Advisory Committee. Meetings were held with representatives from the following agencies and jurisdictions:

- | | |
|---------------------------------|-----------------------|
| § City of Apache Junction | § Town of Florence |
| § Arizona State Land Department | § Town of Gilbert |
| § City of Casa Grande | § Pinal County |
| § City of Chandler | § Town of Queen Creek |
| § City of Coolidge | § Salt River Project |
| § City of Eloy | § Valley Metro |

In addition, a meeting was also held with elected officials from Pinal County at the Pinal County Rural Consultation meeting. Highlights from meetings with each of the jurisdictions named above are documented in the following sections.

3.2.2.1 City of Apache Junction

Location:

City of Apache Junction
300 E. Superstition Blvd
Apache Junction, Arizona
July 12, 2005

Jurisdiction/Agency Attendees:

- § Ron Gritman, City Engineer
- § Bryant Powell, Assistant City Manager
- § Amy Mallory, Management Assistant

Key Discussion Points:

- § Needs analysis makes sense. The City can support the corridor concept, as proposed.
- § Staff stated that a future study, in 15 years for example, after development patterns begin to emerge and some of the variables relating to State Lands are known, will need to take another look at whether the Williams Gateway corridor should be extended to the Florence Junction.
- § State Land has stated indicated that the US 60 reroute needs to be determined before they will auction land within the vicinity.
- § Funding of future corridors is a significant issue. The Pinal County ½ cent sales tax does not generate enough revenue to pay for the corridor.
- § Pinal County is currently investigating impact fees. City of Apache Junction is also looking at impact fees that may include fees for freeway corridors.
- § Apache Junction is working very hard to attract employment to the City.



- § Access preservation on US 60 is very difficult to achieve.
- § Apache Junction expressed support for a combined corridor alignment consisting of the CAP, SRP 500 kV line, and the corridor.
- § Apache Junction will need to select key locations for CAP crossings.

3.2.2.2 Arizona State Land Department

Location:

Arizona State Land Department
1616 W. Adams
Phoenix, Arizona
July 6, 2005

Jurisdiction/Agency Attendees:

- § Luana Caponi, Planning Project Leader II /Asset Mgmt Division
- § Ott Chatupron, ASLD Engineering Section Manager

Key Discussion Points:

- § ASLD staff asked if the US 60 reroute is needed because of physical constraints. It was clarified that the final recommendations will include strong access management practices particularly along the corridor where the bypass is not planned.
- § ASLD is performing an infrastructure study for land south to Elliot Road, and an assessment plan down to Germann Road
- § ASLD stated that the life cycle of many of the dams has been reached and it is not feasible to retrofit many of them.
- § ASLD stated that locating the corridor to the east of the CAP will require significantly more drainage infrastructure.
- § ASLD strongly prefers that the corridor be located on the west side of the CAP. Location of the corridor to the west of the CAP would be consistent with current plans and goals for the area.
- § ASLD would like to see a timeline of corridor development activities so as to not duplicate planning efforts.
- § ASLD has been looking at potential locations for interchanges, and that it will try to design the major arterial system at two-mile spacing.
- § One-mile spaced interchanges would be the absolute minimum spacing.
- § Frontage roads are not being considered for the corridor.
- § ASLD would support collocation of the 500 kV line, CAP, and the corridor.
- § Drainage issues must be addressed in planning and design.
- § By the end of 2006, ASLD will have a much better understanding of Lost Dutchman Heights. By 2007, planning will be largely completed for the area from Germann to Elliot. This area planning will just address infrastructure and hydrology.
- § Landfill will likely be closed.



§ ASLD would like to modify the easement agreement with the Maricopa Flood Control District.

3.2.2.3 City of Casa Grande

City of Casa Grande
510 East Florence Blvd
Casa Grande, Arizona
July 25, 2005

Attendees:

- § AJ Blaha, Public Works Department Engineering Division
- § Jaya Rayaprolu, Public Works Department Engineering Division

Key Discussion Points:

- § City largely understands the results of the needs analysis.
- § City had hoped that a corridor would be considered connecting to I-10 and I-8, but is not surprised that the needs analysis did not support this. This should still be considered in the future.

3.2.2.4 City of Chandler

City of Chandler
215 E. Buffalo Street
Chandler, Arizona
July 12, 2005

Attendees:

- § Mike Normand, Transportation Services & Planning Manager
- § Melinda Brimhall, Transportation Services

Key Discussion Points:

- § The discussion was primarily focused on reviewing the PowerPoint presentation that would be presented to the Chandler Transportation Commission.
- § City of Chandler agrees with the needs analysis and preliminary findings.

3.2.2.5 City of Coolidge

- § Coolidge, in general, agrees with the needs analysis.
- § City staff expressed a preference for the North-South corridor to intersect with SR-287 at the Clemens Road intersection and is preparing a General Plan Amendment that will begin preserving 500 feet of right-of-way for a future transportation corridor along Clemens Road.
- § Coolidge staff feels that the population projections may still be conservative.
- § Heavy travel demand is anticipated between Coolidge, Florence, and the Loop 202.



- § City staff asked if funding will be addressed in significant detail, and if toll roads will be considered as a potential funding source.
- § This study will include a general cost estimate for a corridor. Detailed cost estimates will be generated upon identification of a corridor alignment.
- § Partnerships are important for the eventual implementation of this corridor.
- § Business persons in Pinal County are establishing a partnership organization similar to the East Valley Partnership.
- § The Westcor Mall Development goes to City Council in the near future. Agreement allows Westcor to capture public improvement investment. Westcor will front the money and is reimbursed.
- § Westcor will open when they have a 150,000 service population within 11 miles.
- § Coolidge City Council is generally happy about the corridor, though they would like it extended further into Coolidge.
- § This study will recommend that access on SR-87 and SR-287 be aggressively preserved.
- § SR-87 through Coolidge is 'main street' but ADOT is becoming more aggressive with access management.
- § Adamsville site exists on Clemens Road alignment, though it is unknown how much is significant.
- § Cultural resources/archeology will be significant anywhere near the Gila River.
- § Land in the Coolidge area has been selling for around \$42,000 - \$45,000 per acre.

3.2.2.6 City of Eloy

Location:

City of Eloy
Planning and Development
801 N. Main Street
Eloy, Arizona
July 25, 2005

Jurisdiction/Agency Attendees:

- § Joe Blanton

Key Discussion Points:

- § The City of Eloy agrees with the needs analysis.
- § They hope that a connection to I-10 will be considered in the future.
- § Eloy is currently performing annexation for a new Robson master-planned community.
- § Eloy may be participating in a Small Area Transportation Study and hopes to determine how much right-of-way should be required as development occurs, and on which roads it is needed.



3.2.2.7 Town of Florence

Location:

Town of Florence City Hall
775 N. Main Street
Florence, Arizona
July 13, 2005

Jurisdiction/Agency Attendees:

§ Larry Quick, Town of Florence

Key Discussion Points:

- § The Town sees significant issues trying to connect the north-south corridor to SR-287.
- § There are significant drainage issues east of the Magma dam and CAP.
- § Arizona Farms Road is planned for 6-lanes in east/west direction.
- § Town doesn't see need for another bridge in the immediate future, though they can see the need for at-grade crossings that would be closed during inclement weather.
- § Right-of-way on SR-79 through Florence is limited.
- § Town of Florence feels that it is more feasible to improve SR-79 to accommodate the North-South corridor than any other alignment.
- § Pulte Anthem, Sun City, and Merrill Ranch are all large master-planned communities that would be affected by the North-South corridor if it were to connect to SR-287.
- § Felix Road will be 6-lanes through Anthem.
- § Centex owns two sections of land north of Anthem.
- § Florence is working to have Felix Road continued north from Anthem to Arizona Farms Road.
- § A new hospital is planned south of Hunt Highway, west of Main Street.
- § Anthem will straddle the Hunt Highway.
- § Walker Butte master planned community lies adjacent to GRIC.
- § Florence planning area extends to Arizona Farms Road.
- § Florence is processing annexation north to Magma Road. Florence has processed 18 annexation applications within the last 18 months.

3.2.2.8 Town of Gilbert

Location:

Town of Gilbert
50 E. Civic Center Drive
Gilbert, Arizona
July 25, 2005

Jurisdiction/Agency Attendees:



- § Tami Ryall, Assistant Town Manager
- § Joseph Hughes, Intergovernmental Relations Coordinator

Key Discussion Points:

- § Town of Gilbert largely agrees with the needs analysis findings.
- § Town staff believes that the population projections used in the Planning Model are too high. They believe that other infrastructure, and in particular sanitary sewer, will not be able available to accommodate the projected population by the year 2030.
- § Town staff stated that the study team should meet with City of Mesa. It was clarified that the City of Mesa is on the Technical Advisory Committee for the Williams Gateway Corridor and that input is being received via the Williams Gateway study. City of Mesa attended the Joint TAC meetings held in June and August.

3.2.2.9 Pinal County

Location:

Pinal County
31 North Pinal Street, Building F
Florence, Arizona
July 8, 2005

Jurisdiction/Agency Attendees:

- § Ken Buchanan, Pinal County
- § Kathy Borquez, Pinal County
- § Greg Stanley, Pinal County

Key Discussion Points:

- § Pinal County staff is pleased with the needs analysis results. They do have concerns about the ‘pinch-points’ such SR-287 and SR-79.
- § Pinal County doesn’t have a problem with combining the corridor with other utilities. They did question whether the corridor should be pressed further to the east because of the improvements that area occurring on Ironwood, etc.
- § Figuring out how to connect the corridor to either SR-79 or SR-287 through the Florence area will be a significant issue because of the proposed developments.
- § An additional crossing over the Gila River is important.
- § Clemens Road is the preferred alignment. Valley Farms is too populated.
- § Florence is planning for Felix to be a 7-lane roadway through Anthem.
- § Access management on existing state highways will be a significant issue. The upcoming ADOT Access Management Plan will be more policy and guidelines than roadway specific.
- § Pinal County staff stated that they will preserve the corridor if the study results in corridor definitions that are supported by the Board of Supervisors and associated policies for corridor preservation.
- § Transportation issues in the western portion of Pinal County are significant.



3.2.2.10 Town of Queen Creek

Location:

Town of Queen Creek
22350 S. Ellsworth Road
Queen Creek, Arizona
July 8, 2005

Jurisdiction/Agency Attendees:

- § Mark A. Young, Public Works Department
- § Dick Schaner, Public Works Director
- § Cynthia Seelhammer, Town Manager
- § John Kross, Planning and Development

Key Discussion Points:

- § Dick Schaner believes that the higher-level ADOT Williams Gateway corridor study can influence the more detailed MAG Williams Gateway Alignment Study.
- § Dianne Kresich stated that this study will likely make recommendations for jurisdictional responsibility for the recommended corridors.
- § Dianne stated that SATS money will be available, likely in November or December, following the recommendations to the State Transportation Board.
- § Queen Creek staff would like this study to identify specific alignments so that they are able to begin to preserve right-of-way.

3.2.2.11 Salt River Project

Location:

Salt River Project
1521 N. Project Drive
Phoenix, Arizona
July 6, 2005

Jurisdiction/Agency Attendees:

- § Dan Hawkins
- § Tom Novy

Key Discussion Points:

- § SRP preferred route is a 1000' line on the west side of the CAP. SRP will ultimately require only 160'.
- § SRP will not own any of the land, but will gain an easement.
- § A substation is proposed immediately adjacent to the CAP between Germann Road and Ocotillo Road. The substation will ultimately cover approximately 30



acres. SRP preference is to locate the substation immediately adjacent to the CAP.

§ The Rittenhouse Airfield is located directly adjacent to the CAP.

§ SRP would not object to a corridor directly adjacent to the power line easement. A 160' ROW is sufficient for maintenance, etc. Vertical clearance would need to be considered.

§ The Pinal County linear trail system was approved by the Board of Supervisors. The plan proposes a trail system in conjunction with utility corridors (e.g. 500 kV line) and the CAP.

3.2.2.12 Valley Metro

Location:

Valley Metro/RPTA
302 N. 1st Avenue
Phoenix, Arizona
July 6, 2005

Jurisdiction/Agency Attendees:

§ Stuart Boggs, Valley Metro/RPTA

Key Discussion Points

§ Proposition 400 has \$5,000,000 designated for planning and design of high-capacity transit facilities to be initiated sometime after 2025.

§ Local jurisdictions recognize that this funding may need to be advanced because of the explosive growth in the area.

§ There will be large concentrations of employment in the southeast valley, particularly in the Gilbert and Chandler areas. These communities are expected to become a net exporter of jobs.

§ Chandler and Gilbert are rapidly approaching build-out conditions.

§ Existing and projected residential development follows alignment of Rittenhouse Road and then Hunt Highway down to Florence. This is also the alignment of a Union Pacific Railroad line.

§ The Union Pacific Line is a single-track facility with segments of double-track. Sufficient right-of-way exists for double tracking the rail corridor which could also for an opportunity for commuter rail and freight operations within the corridor. Commuter rail service from Florence with intermediate stops at five to ten mile spacing could address the peak trip needs of emerging bedroom suburbs and reduce pressure on the regional road system. Partnerships with Union Pacific should be considered.

§ Some communities in Maricopa County, including Gilbert, are beginning to look for land for commuter rail stations.

§ Express bus service between bedroom communities in Pinal County and major employment centers in southeast Maricopa County could address work trips and address peak period congestion. Potential lines include San Tan Express,



Chandler/Williams Field Road, Power Road, and Queen Creek routes that terminate in the Williams Gateway area.

- § Small-Area Transportation studies should address multi-modal opportunities.
- § Specific roadway improvements should identify transit-oriented roadway improvements (i.e. HOV lanes, cue jumpers, traffic signal priority, potential regional park-and-ride locations, etc.) that would improve the efficiency of transit operations in these regional corridors.
- § Right-of-way should be preserved for future commuter rail corridor.

3.2.12.13 Pinal County Elected Officials Rural Consultation

On August 15, 2005 the Arizona Department of Transportation (ADOT) and the Central Arizona Association of Governments (CAAG) hosted a Rural (Non-Metropolitan) Elected Officials Consultation Meeting at the Pinal County complex in Florence, Arizona.

The purpose of the meeting was to receive input from elected officials in attendance on preliminary findings of the three ongoing ADOT Corridor Definition Studies; the Pinal County Corridors Definition Study, the Williams Gateway Corridor Definition Study, and the US 60 Corridor Definition Study. The meeting also provided elected officials with a preview of information to be presented to the public at four informational open houses scheduled for August 22 in Apache Junction, August 23 in Queen Creek, August 29 in Gilbert, and August 30 in Florence.

Dianne Kresich of ADOT Transportation Planning Division and Dave Perkins of Kimley-Horn and Associates, Inc. presented an overview of study progress, preliminary findings of the corridor needs assessment phase of the study, and preliminary findings of the corridor feasibility assessment phase of the study.

Attendees:

- | | |
|------------------|-------------------|
| § Maxine Leather | § Edward Farrell* |
| § David Snider* | § Lionel Ruiz* |
| § Arnie Raasch* | § Ken Buchanan |
| § Jess Knudson | § Greg Stanley |
| § Joseph Hughes | § Sandie Smith* |
| § Bill Leister | § Carl Holcombe |
| § Gail Barney* | § Roy Chavez |
- * Elected officials

Key Discussion Points:

- § Several elected officials and staff members expressed appreciation for the ADOT studies and expressed support for the preliminary findings presented at the meeting.
- § Several elected officials and staff members voiced strong concern that the 2030 population projections for Pinal County that were used in the transportation planning model (which served as the basis for the corridor needs assessment phase of the study) were too low and did not properly reflect the rate of growth



currently underway and anticipated for Pinal County. It was explained that the source of Pinal County population forecasts used in model was the Central Arizona Bond Feasibility Study which was considered by Regional, County, and local jurisdictions and the Technical Advisory Committee (TAC) to be the best available information on Pinal County population forecasts. It was also stated that presentations made by the study team to the TAC demonstrated that the population projections were aggressive in terms of historical population growth in Phoenix and Las Vegas. It was stated that the Town of Maricopa is currently developing population projections for its planning area.

- § Several elected officials and staff members inquired about the timing for development and construction of the corridors recommended in the study. It was explained that corridor development by ADOT requires that each corridor be designated as a “state route” by the State Transportation Board and that given such a designation, funding for corridor development would need to be programmed. It was further explained that available ADOT funds have been programmed through fiscal year 2011.
- § An elected official stated that it was preferable for the North-South Corridor to cross the Gila River and connect to SR 287 rather than connect to SR 79 north of Florence. It was explained that a corridor crossing the Gila River would result in significant impacts to at least two approved master planned communities in Florence.
- § An elected official stated that the location of the North-South Corridor on the west side of the Central Arizona Project (CAP) was “too far west” and consideration should be given to placing the corridor east of the CAP. It was explained that a corridor east of the CAP would require a significantly larger investment in drainage facilities than required on the west side of the CAP and a corridor to the east of the CAP would not be consistent with planning concepts under development by the Arizona State Land Department.
- § An elected official supported the finding that a corridor was not needed along the Hunt Highway alignment in Maricopa County.
- § An elected official asked about right-of-way requirements for the corridors. It was explained that typical right-of-way requirement for freeways built to ADOT design standards was 300 feet.
- § An elected official stressed the need for County and local jurisdictions to preserve right-of-way for the corridors approved by the State Transportation Board. It was also stressed that coordination should be maintained with the State Land Department to identify and preserve corridors on State Trust Land.
- § An elected official supported the need to consider alternate modes of travel and to accommodate regional utilities within a single corridor.
- § Several elected officials and staff members voiced strong concern that ADOT should conduct corridor studies in western Pinal County, west of I-10. In particular, a need to study SR 347 was identified. It was explained that the study areas for the three ADOT Corridor Definition Studies were established by the Arizona legislature.
- § A staff member stated that economic development opportunities near Florence Junction justified a study of the US 60 corridor east of Florence Junction.
- § An elected official stated that efforts were underway to establish funding sources to support corridor development in Pinal County including



reauthorization of the Pinal County half-cent sales tax and a County impact fee ordinance.

- § An elected official stated that efforts were underway for legislation that would allow the Arizona State Land Department to dedicate right-of-way for corridor development when corridor development represented a value to the State.
- § An elected official stated that transfer of portions of US 60 was acceptable to Pinal County if the recommended US 60 corridor was developed and constructed.

3.2.13 *Alternative Corridor Definitions*

Existing conditions, future conditions³, and stakeholder and public input⁴ were reviewed to develop a set of corridor definition alternatives that are consistent with the needs analysis and Corridor Concept defined in **Section 2.2.4**. Portions of the study area that provide opportunities or present constraints for corridors definition alternatives were identified. Areas with significant adverse impacts or constraints were excluded from consideration.

Input received from stakeholders and jurisdiction representatives consistently pointed to a corridor definition that generally follows the CAP alignment from the Williams Gateway corridor (Frye Road alignment) south to the intersection of the CAP with the Arizona Magma Railroad. This definition is consistent with and is supported by information collected during the existing and future conditions analysis.

A corridor definition south of the Arizona Magma Railroad is less certain. Potential definitions include connecting the North-South corridor to SR-79 in the vicinity of Arizona Farms Road, or alternatively connecting the North-South corridor to SR-287 near Valley Farms Road.

From a travel demand perspective, a connection to SR-287 may provide more benefit to parallel north-south arterials than would a connection to SR-79. Future north-south traffic on Felix Road and Attaway Road, for example, may be higher with this alternative if the corridor is connected to SR-79 rather than to SR-287.

A summary of opportunities and constraints for the corridor definition alternatives from an engineering, environmental, land-use, and jurisdictional perspectives is presented in the following sections.

³ Pinal County Corridors Definition Study, Working Paper No. 1, Existing and Future Conditions, Needs and Deficiencies, June 1, 2005. Available at <http://tpd.azdot.gov/planning/corridorstudies.php>

⁴ Pinal County Corridors Definition Study, Summary Report No. 1, Public Involvement Round One, May 19, 2005. Available at <http://tpd.azdot.gov/planning/corridorstudies.php>



3.3 Engineering Opportunities and Constraints

This section includes a high-level discussion of significant engineering, environmental, and land-use compatibility opportunities and constraints associated with the Corridor Concept and alternative corridor definitions presented in **Section 3.2**. Specifically, this section includes a discussion of study area drainage and environmental characteristics, the potential for a combined corridor with Salt River Project 500 kV line, crossings of the Gila River, and multi-modal/inter-modal opportunities within the study area.

3.3.1 Drainage

A significant consideration for future development within the study area is drainage and the mitigation of storm water run-off. This section includes a discussion of major drainage issues and features and recommendations for drainage mitigation.

3.3.1.1 Major Basin Description

The entire project area is in the watershed of the Gila River and can be divided into three general watershed sub-basins. The first sub-basin covers about the northern two-thirds of the project area. The southern boundary of this general sub-basin is the Magma Arizona Railroad bed. The second sub-basin is the area south of the Magma Arizona Railroad to the Gila River. The third and smallest sub-basin is the area south of the Gila River.

The northern sub-basin of the project drains to the East Maricopa Floodway or Queen Creek Wash. Queen Creek wash is a tributary to the Sanoqui Wash, which is a tributary to the Gila River. The Sanoqui Wash does flow through a portion of the East Maricopa Floodway east of the project limits before discharging into the Gila River. Land use in this basin is alluvial desert in the upstream portions of the watershed to agriculture, low density housing, and subdivision development in the downstream portions.

The middle sub-basin lies between the Magma Arizona Railroad to the north and the Gila River to the south. The upstream segments of this sub-basin are desert alluvium in the State Trust lands and private agricultural lands in the downstream. There are no major drainage channels in this sub-basin. The Middle and Lower Magma Channels deliver the discharge from the Magma Flood Retarding Structure to the Gila River. Land use in the sub-basin is alluvial desert upstream and mostly agricultural lands downstream. There are several residential sub-divisions currently under construction in this area.

The southern sub-basin is composed of the area south of the Gila River. All storm water runoff from these areas is discharged into the river. Land use in this sub-basin consists of agriculture, mixed use, and residential housing in the town limits of Florence.

A. Drainage Facilities

The major drainage feature and ultimate discharge for the entire watershed is the Gila River. The Gila is an ephemeral river that has undergone drastic



morphologic changes upstream and downstream of the project area due to dams, diversions, and in-stream sand and gravel mining.

The next major drainage feature in the project area is the Queen Creek Wash. Queen Creek Wash is also an ephemeral wash that is dry except after significant rainfall events. The Whitlow Ranch Dam upstream of the project boundary has minimized the flooding threat from the upstream watershed. The dam is located east of the project area upstream of Queen Valley. Queen Creek Wash is also controlled by the Sonoqui Detention Dam that is upstream of the CAP. The wash has been subject to a great deal of in-stream mining that has led to instability in the channel and has several non-engineered levees throughout its length.

B. Dams and Reservoirs

There are several dams and reservoirs that interrupt the natural drainage patterns that existed historically in the watershed and essentially split the watershed. The Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures were designed and built by the Natural Resources Conservation Service (NRCS) in the late 1960's. They were designed to detain storm water runoff from 100-year return frequency storm event and slowly release it downstream. The structures discharge into the Powerline Floodway, which conveys the low flows from the structures to the East Maricopa Floodway approximately 12 miles downstream east of the project area. The Powerline Floodway is a concrete lined channel with a trapezoidal cross-section that has a top width of about 20 feet. The Flood Retarding Structures are immediately upstream of the Central Arizona Project Canal. The structures are owned by the NRCS and are operated and maintained by the Flood Control District of Maricopa County.

The Sonoqui Detention Dam was built and constructed by the Bureau of Reclamation to protect the Central Arizona Project Canal from the effects of flooding upstream of the canal. The Sonoqui Detention Dam is south and essentially an extension of the Rittenhouse Flood Retarding Structure. The dam also controls the flows in the Queen Creek Wash. Discharge is released from the dam through four 72-inch diameter culverts that cross the CAP. The dam ends at the Magma Arizona Railroad.

The Magma Flood Retarding Structure is similar to the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures in that it was designed and constructed by the NRCS in the early 1960s. The Magma Flood Retarding Structure is south of the Sonoqui Detention Dam and begins on the south side of the Magma Arizona Railroad bed, but is approximately two miles upstream of the CAP. The dam is owned by the NRCS and operated and maintained by the Magma Flood Control District.

Together, the CAP and dams are the most significant drainage divide in the project area. All areas downstream of the CAP and dams are protected from the 100-year return frequency storm event by the CAP and dams. All of the dams average between 20-30 feet tall and will impound water up to that level on the upstream side. All dams have emergency spillways for the



release of storm water above the runoff volume associated with the 100-year storm event.

C. Other Infrastructure

As stated, the Central Arizona Project Canal also affects the historic drainage patterns of the project area along the five dams. There are a series of culverts that cross the CAP canal at irregular intervals. Some storm water runoff that would exceed the capacity for the dams or be accumulated between the dam and the CAP in the case of the Magma Flood Retarding Structure would be captured by the CAP and carried downstream along the slope of the CAP canal until the capacity of the CAP were exceeded.

While other local roadway and agricultural infrastructure has drastically altered the drainage patterns in smaller localized areas, they do not significantly alter the drainage pattern of the project area as a whole.

3.3.1.2 Drainage Issues

This section includes a discussion of major issues associated with drainage within the study area.

A. Regional Hydrology

The most significant drainage issue in the eastern project area upstream of the dams and CAP is the alluvial fan flooding that can occur. Alluvial fans are created where the topographic gradient reduces from the mountains to the desert valleys and the capacity to move sediment is reduced. The sediment carried to this point is then spread out over a wide area. Alluvial fan flooding consists of shallow flooding over a wide area. There is uncertainty with the location of the flooding channel on an active alluvial fan and the morphology of the small alluvial fan channels can change after major storm events. Flooding on an alluvial fan can quickly alter its course across the fan thereby increasing the flood hazard on the entire floodplain.

B. Localized Flooding

The areas downstream of the dams and CAP are protected from the 100-year storm by the dams. The most significant drainage issues in these lands is localized flooding and ponding that backs up behind the embankments used for roadways, railways, and agriculture ditches and infrastructure. There are some areas downstream of the dams that are native alluvial desert, but the drainage issues and potential for flooding would be lower than the potential upstream of the dams. The vast majority of the floodwater and sediment source has been cut off from the upstream watershed by the dams and the CAP.

Drainage issues south of the Gila River include localized flooding from roadway and agricultural infrastructure and flooding from the Gila River should the flooding leave the main channel section of the river.



C. Scour, Sediment, and Erosion

Scouring, erosion, and sediment deposition can all have negative impacts in the project area. Sand and gravel mining has altered the equilibrium of the Gila River and Queen Creek Wash channels. In-stream mining facilities could affect the stability of some transportation structures unless designs are completed to protect the structures. Localized scour at culvert outlets can be prevented through the proper selection and construction of scour countermeasures. Sediment deposition can occur in areas of topographic slope change or behind embankments.

D. Emergency Spillway Discharges

An additional drainage issue would be for rare rainfall events above the 100-year frequency event. The dams built upstream of the CAP were built to detain the 100-year storm event. Runoff would be discharged through the emergency spillways during larger events. The emergency spillways are located on the ends of the dams and could cause widespread flooding if the emergency spillways ever operated.

E. FEMA Regulation Floodplains

Several washes in the project area have been designated by the Federal Emergency Management Agency (FEMA) as Zone A flood hazard areas. Zone A is a Special Flood Hazard Area inundated by 100-year flood, but no base flood elevations are determined. The section of the Gila River through the Town of Florence has been designated as Zone A8. Base Flood Elevations and flood hazard factors have been determined. It is possible that some or all of the Zone A washes downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures could be removed from FEMA regulation in the future. These Zone A washes were delineated prior to the construction of the dams. Since the dams were designed to detain the 100-year flow event, the contributing watershed on the downstream section of the washes is significantly smaller and may not produce enough discharge to be designated as a FEMA wash.

F. Other Drainage Resources

Several major drainage studies have been completed in parts of the project areas.

§ East Mesa Area Drainage Master Plan was completed for the Flood Control District of Maricopa County. This study covered the area downstream of the Powerline Vineyard Road and Rittenhouse Flood Control Structures to the western limits of the project area with the southern boundary being approximately Queen Creek Road.

§ The Queen Creek/Sanoqui Wash Hydraulic Master Plan was completed for the Flood Control District of Maricopa County. The study area for this project was also the area downstream of the Central Arizona Project Canal between Queen Creek Road to the north and Hunt Highway to the south.



- § Structure Assessments for the Powerline, Vineyard Road, and Rittenhouse Flood Control Structures were completed for the Flood Control District of Maricopa County. The study assessed the current condition of the structures.
- § The Arizona State Lands Department is planning to complete a master drainage study for all State Trust lands.
- § The Pinal County Department County of Public Works is completing a drainage inventory for all lands in Pinal County over the next five years.

3.3.1.3 Drainage Conclusions

An overview of drainage features is presented in **Figure 3-5, *Drainage Features***. Based on the information presented in the preceding sections, several issues should be considered in selection of the corridor definition. These are:

- § Areas downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures are protected from the 100-year return frequency storm event by structures themselves. The Central Arizona Project Canal adds additional flooding protection.
- § Lands immediately downstream of the dams and the Central Arizona Project Canal also become the new apex for the alluvial fan areas downstream. Sediment movement and volume in this area is minimized by being cutoff from the upstream sediment supply.
- § Drainage plans must consider the effects of alluvial fan formations and flooding in the upstream sections of the project areas.
- § Bridges or culverts crossing major washes should be designed to protect the roadway from impacts of scouring or erosion.
- § Any alteration to any Natural Resource Conservation Service structure – Powerline, Vineyard Road, Rittenhouse, or Magma Flood Retarding Structure, or any of the associated floodways would require the approval of the NRCS.
- § Alteration to the Sonoqui Detention Dam would require the approval of the CAP and or US Bureau of Reclamation.

3.3.2 Land Subsidence and Fissures

Ground-water depletion throughout many parts of central and southern Arizona has caused significant declines in the water table level. Lower water tables result in land subsidence and earth fissures which pose geologic hazards and engineering challenges in many parts of southern Arizona. Differential land subsidence and earth fissures have damaged a variety of engineering structures including buildings, streets, highways, railroads, earthen dams, water wells, water distribution systems, and waster-water treatment facilities⁵. Large portions of the study area are known to have experienced significant declines in the water table level. Information obtained from the Arizona Geological Survey⁶ depicts that in some areas within the study area the water table has declined over 300 feet, resulting in land subsidence and areas with high concentrations of fissures.

⁵ Schumann, Herbert H., and Genualdi, Robert B. *Land Subsidence, Earth Fissures, and Water-Level Changes in Southern Arizona*, 1986)

⁶ Arizona Bureau of Geology and Mineral Technology, *Geological Survey Branch, Map 23*, 1986

Earth fissures first appear as narrow cracks that are generally less than 1 inch wide or as alignments of shallow holes or sink-like depressions that are typically less than 3 inches in diameter. They can range from a few feet to more than one-half mile in length. Throughout central and southern Arizona, water flowing into fissures has produced gullies as deep as 16 feet as and wider than 50 feet.

Land subsidence and earth-fissure damage are important considerations during the design of major engineering structures in areas of measured subsidence. Within the Pinal County Corridors study area, land subsidence and fissures are particularly evident near US 60 in the Apache Junction area and along Hunt Highway in southeast Maricopa County as depicted in **Figure 3-6, Land Subsidence and Earth Fissures**. The Picacho area south of Coolidge has also experienced measurable subsidence and earth fissures.

The CAP canal is an example of a horizontal engineering structure that has carefully considered subsidence and fissures into its design and includes steel-reinforced sections to maintain structural integrity until fissures can be repaired. The CAP route was planned to bypass known areas of subsidence and fissure, though it inevitably passes close to areas of known fissures.

3.3.3 *The Central Arizona Project Canal*

The Central Arizona Project canal (CAP) comprises a 336-mile-long system of aqueducts, tunnels, pumping plants, and pipelines. Constructed by the U.S. Bureau of Reclamation, the CAP transports approximately 1.5 million acre-feet of Colorado River water per year to agricultural, urban residents, and Indian Communities in Pima, Pinal, and Maricopa counties. The CAP extends from Lake Havasu to the southern boundary of the San Xavier Indian Reservation located 14 miles southwest of Tucson. The CAP is managed and operated by the Central Arizona Water Conservation District (CAWCD).

The CAP passes through the heart of the Pinal County Corridors study area, approximately bisecting the study area in two. Entering the study area in Apache Junction between Meridian Road and Ironwood Road, the CAP runs in a south-southeasterly direction approximately parallel to the Hunt Highway corridor. Much of the CAP is located on Arizona State Trust Land, with sections passing through private, Bureau of Land Management, and military land. The average width of the canal is 80 feet across. Some segments of the canal are oversized sections that act as an internal reservoir system and are 160 feet across.

Because of the CAP's geographic spans and magnitude, any new transportation corridors within the study area will have to consider the CAP throughout the corridor development process. Considerations, among others, must include grade-separated crossings, drainage, and environmental protection. The Central Arizona Water Conservation District will be an important stakeholder and should be invited to participate in the future corridor development process.

Because of the CAP's centralized location within the study area, and its northwest to southeast orientation, locating the transportation corridor directly west of the CAP has been suggested by multiple stakeholders as a desirable alternative corridor for a transportation corridor. This is discussed in more detail in **Section 3.3.5**.

3.3.4 SRP500 kV Line

The Arizona Corporation Commission voted on August 16, 2005 to confirm a Certificate of Environmental Compatibility for the Pinal West-to-Southeast Valley/Browning project. The project includes new 500 kilovolt (kV) and 230 kV transmission lines and substations that will serve Pinal and Maricopa Counties. The project is planned jointly by the Salt River Project Agricultural Improvement and Power District (SRP), Arizona Public Service Company, Tucson Electric Power Company, the Santa Cruz Water and Power Districts Association, Electrical District Number 2, and Southwest Transmission Cooperative Inc. The project is managed by SRP⁷.

As applicable to the corridor definition study area, the approved route for the new 500 kV transmission line enters the study area on Valley Farms Road at SR-287. The approved route follows Valley Farms Road north until it intersects the Union Pacific Railroad. The line parallels the Union Pacific Railroad until it intersects with the Arizona Magma Railroad, and then follows the Arizona Magma Railroad until it intersects with the CAP. The transmission line route is then located directly adjacent to the west side of the CAP and continues in a north-northwest direction until approximately the intersection of the CAP and Idaho Road.

Two substation sites are proposed as part of the project. These are located at the intersection of the CAP and the Magma Arizona Railroad, and adjacent to the CAP between Pecos Road and Germann Road. The approved route of the 500 kV transmission line is shown in **Figure 3-7, Approved Route for SRP 500 kV Line**. The approved route provides SRP with a 1000 ft. corridor of which it will ultimately select 160 feet for an easement.

In order to minimize the impact of the SRP 500 kV line and a transportation corridor on future master planned communities and developments, it has been suggested by multiple stakeholders to locate the transportation corridor, where feasible adjacent to the 500 kV transmission line. This is discussed in more detail in **Section 3.3.6**.

3.3.5 Shared Use Paths and Trails

Pinal County's recently completed Trails Plan (2005) establishes the framework for a countywide system of non-motorized and motorized trails. The planning framework incorporates existing regional trail corridors, quasi-public corridors, such as utility easements, floodplains, abandoned railways, and road rights of way.

The Central Arizona Project Canal corridor is identified as an important public corridor that provides linkages and access with regional trail systems bordering the county. The Plan states that Pinal County has over 50 miles of CAP canal system that would provide a not only a quality trail system for county residents but also an important regional link to both Pima County and Maricopa County. The plan calls for developing a feasibility study before residential development occurs along the CAP canal corridor so that easement, right-of-way, crossing barriers, and access issues can be resolved. Discussions with Pinal County staff suggested that a transportation corridor may be compatible with a combined CAP/500kV/Trail corridor, as is discussed in **Section 3.3.6**. As such, it is recommended that future trail feasibility studies address access to and from the trail system and address mitigation that would be required for a combined trail/transportation/utility corridor. The

⁷ Salt River Project, "AZ Power Planning for Arizona's Future, PW-SEV/BRG transmission project", August 12, 2005. <http://www.azpower.org/pwsevbob/>

trail corridor would exist on top of the maintenance road that would exist in conjunction with the 500 kV line.

3.3.6 *Shared CAP/SRP 500 kV Line/Trails/North-South Corridor*

As described in **Section 3.3.3**, and **Section 3.3.4**, the CAP, SRP 500 kV transmission line approved route and the North-South corridor all share a common element – transport of goods and commodities (e.g. water, electricity, and vehicles) in a northwest-southeast direction,. Because of the potential common ‘footprint’ of these large, horizontal engineering structures (CAP and 500 kV line), and the potential for a new large transportation corridor (North-South corridor), stakeholders have repeatedly suggested that where possible, the SRP line and the North-South corridor should be collocated in to a ‘utility and transport’ corridor. Consolidation of as much infrastructure as possible into a ‘utility and transport corridor’ would minimize the adverse impacts to future residents and reduce the mitigation that will be required as development continues. In addition, Pinal County has proposed developing a linear parkway and trail system⁸ along the CAP alignment that may be compatible with the ‘utility and transport’ corridor.

SRP has stated that they would not object to transportation corridor directly adjacent to the 500 kV line. SRP would need to consider a transportation corridor in the design and construction of the transmission line structures. Sufficient vertical access would need to be maintained over roadway crossings that provide access to and from the transportation corridor. The Arizona State Land Department, which owns much of the land over which the corridor crosses, has stated that they would prefer the ‘transport and utility’ corridor to be located on the west side of the CAP. Locating the ‘transport and utility’ corridor on the west side of the CAP would reduce the impact to State Land east of the CAP. In addition, locating the corridor on the west side of the CAP provides much-needed protection to downstream (the west of the CAP) lands and structures from alluvial fan flooding that is seen to the east of the CAP. In addition, a combined corridor would also need to accommodate the railroad.

3.3.6 *Gila River Crossing*

The Gila River is a major east-west feature that passes through the study area. The river, particularly during times of inclement weather, can significantly inhibit north-south travel. In addition, the river presents a large obstacle to the continuity of the arterial street system.

Stakeholders have expressed a strong desire for an additional crossing of the Gila River. Currently, the only all-weather crossings located to the east of the Gila River Indian Community are located at Attaway Road and on SR-79. As it pertains to the North-South corridor, a new crossing of the Gila River would be required in order to connect the North-South corridor to SR-287. A connection to SR-79 would not require a new crossing of the Gila River, though improvements to the existing crossing on SR-79 may be required.

3.3.7 *Right-of-Way Requirements*

A new 6-lane, access controlled freeway corridor would require approximately 300 feet of right-of-way. Connections to both SR-79 and SR-287 would require that new right-of-way be obtained for the entire length of the corridor.

⁸ *Pinal County Trails Plan, 2005*



However, if the North-South corridor is connected to SR-79 at Arizona Farms Road, and it is decided that the North-South corridor should be extended to SR-287 via Arizona Farms Road, additional right-of-way would be required on SR-79. Currently, ADOT records show that 200 feet of right-of-way are available on SR-79 through the Florence area. Existing right-of-way within the study area is shown in **Figure 3-8, Existing ADOT Right-of-Way**.

3.3.7 Summary of Engineering Opportunities and Constraints

A summary of engineering opportunities and constraints for the definition alternatives is presented in **Table 3-1**.



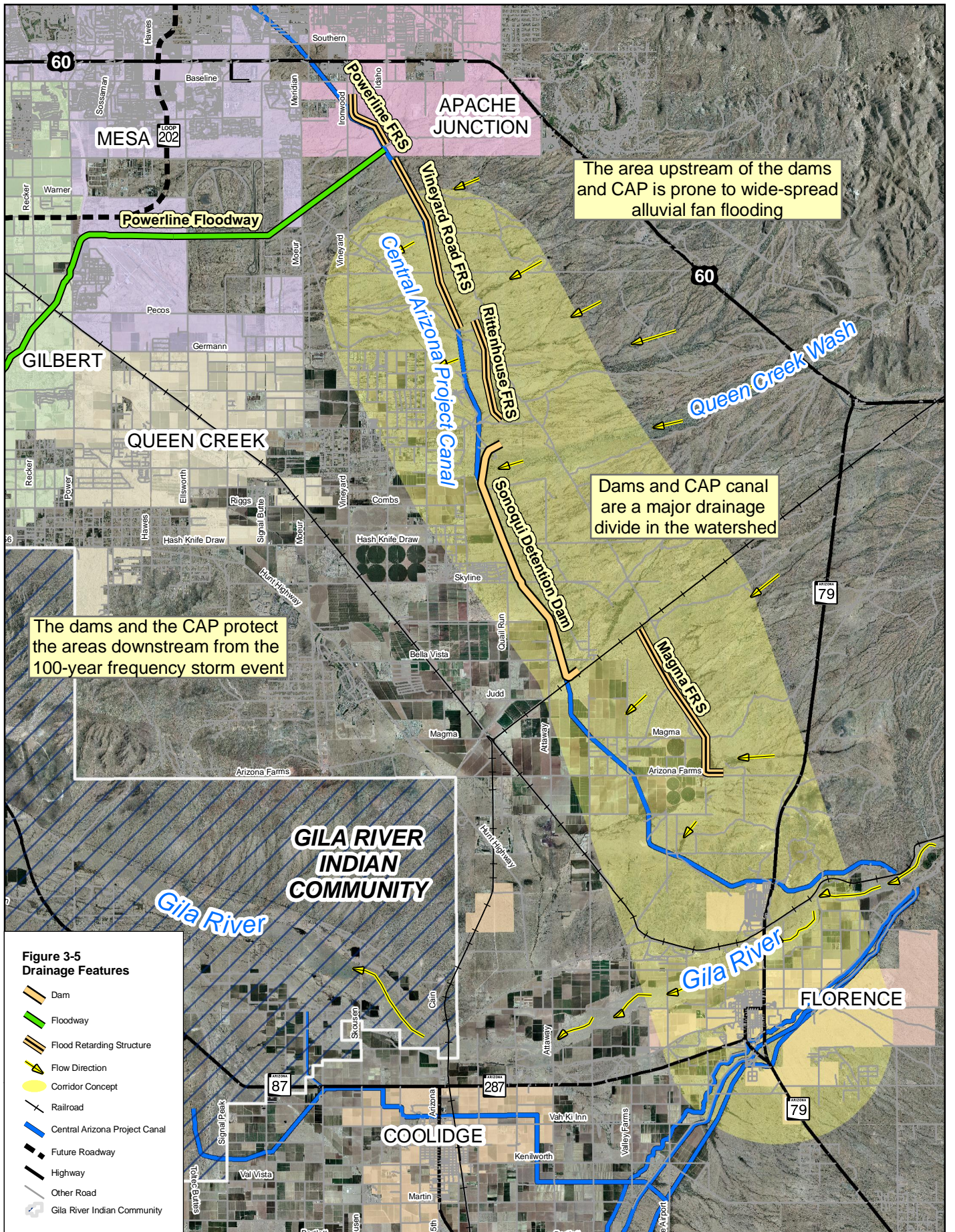
Table 3-1 – Summary of Engineering Opportunities and Constraints

Corridor Definition Alternative	Engineering Opportunities	Engineering Constraints
<p>North-South corridor from Williams Gateway Corridor (Frye Rd. alignment) to Arizona Magma Railroad near Judd Rd</p>	<ul style="list-style-type: none"> • North-end connection of corridor definition can accommodate any alignment ultimately identified for Williams Gateway Corridor. • Corridor location west of CAP is preferable from drainage perspective. Areas downstream of the Powerline, Vineyard Road, and Rittenhouse Flood Retarding Structures are protected from the 100-year return frequency storm event by structures themselves. The Central Arizona Project Canal adds additional flooding protection. • A connection to SR-287 could parallel the approved 500 kV transmission line alignment where feasible. A shared corridor is compatible with both CAP and SRP 500 kV transmission line uses • Fissures and subsidence has been well documented along CAP alignment. Future fissures could be mitigated for both the CAP and transportation corridor. 	<ul style="list-style-type: none"> • Drainage plans must consider the effects of alluvial fan formations and flooding in the upstream sections of the project areas. • Bridges or culverts crossing major washes should be designed to protect the roadway from impacts of scouring or erosion. • Any alteration to any Natural Resource Conservation Service structure – Powerline, Vineyard Road, Rittenhouse, or Magma Flood Retarding Structure, or any of the associated floodways would require the approval of the NRCS. • Alteration to the Sonoqui Detention Dam would require the approval of the CAP and or US Bureau of Reclamation. • Collocating corridor with railroad, CAP, and 500 kV transmission line increases the length of east-west grade-separated interchanges and crossings required. It is estimated that at potential interchange areas the corridor may need to be offset from the CAP, SRP 500 kV line and railroad by up to 1500 feet to provide the necessary vertical clearance above the railroad and under the transmission line. • Transmission lines may need to be constructed higher than would normally be required to provide minimum vertical clearance. • Proposed SRP substation sites are located adjacent to the CAP alignment. However, ultimate location for substations has not been selected, allowing opportunity to coordinate with SRP.
<p>Southern Connection Alternative 1: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-79</p>	<ul style="list-style-type: none"> • A connection to SR-79 reduces the total project cost by ADOT as the overall corridor is shorter and a connection to SR-79 does not necessitate a new bridge over the Gila River • A connection to SR- 79 via Magma Dam area is an opportunity 	<ul style="list-style-type: none"> • A connection to SR-79 may require significant improvements to SR-79 in Florence including right-of-way acquisition that may significantly impact existing structures. This connection would also require access and interchange improvements at Corrections facilities and at SR-287 /SR-79 junction. • Connection to SR-79 'misaligns' the North-South corridor from straight-line to Clemens Road alignment, which may become a major transportation facility beyond the year 2030.



Table 3-1 –Summary of Engineering Opportunities and Constraints (continued)

Corridor Definition Alternative	Engineering Opportunities	Engineering Constraints
<p>Southern Connection Alternative 2: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-287 near Valley Farms Road.</p>	<ul style="list-style-type: none"> • A connection to SR-287 could parallel the approved 500 kV transmission line alignment where feasible. • A connection to SR-287 would provide an additional crossing of the Gila River. Valley Farms, Felix, and Attaway Roads are assumed to be multi-lane roadways with bridges over the river. If these are not constructed as river crossings, then the SR-287 connection is desirable to provide a river crossing. • A connection to SR-287 near Valley Farms Road is more closely aligned with the Clemens Road alignment, which is envisioned by City of Coolidge to become a major transportation facility beyond 2030 that would provide access to the Coolidge airport, regional shopping centers, and to SR-87/I-10. 	<ul style="list-style-type: none"> • A connection to SR-79 may require improvements to SR-79 in Florence including right-of-way acquisition that may significantly impact existing structures. This connection may also require access and interchange improvements at Corrections facilities and at SR-287 /SR-79 junction.



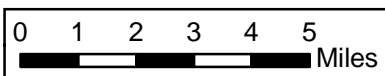
The area upstream of the dams and CAP is prone to wide-spread alluvial fan flooding

Dams and CAP canal are a major drainage divide in the watershed

The dams and the CAP protect the areas downstream from the 100-year frequency storm event

**Figure 3-5
Drainage Features**

- Dam
- Floodway
- Flood Retarding Structure
- Flow Direction
- Corridor Concept
- Railroad
- Central Arizona Project Canal
- Future Roadway
- Highway
- Other Road
- Gila River Indian Community



Data Source:
Arizona Land Resource Information System



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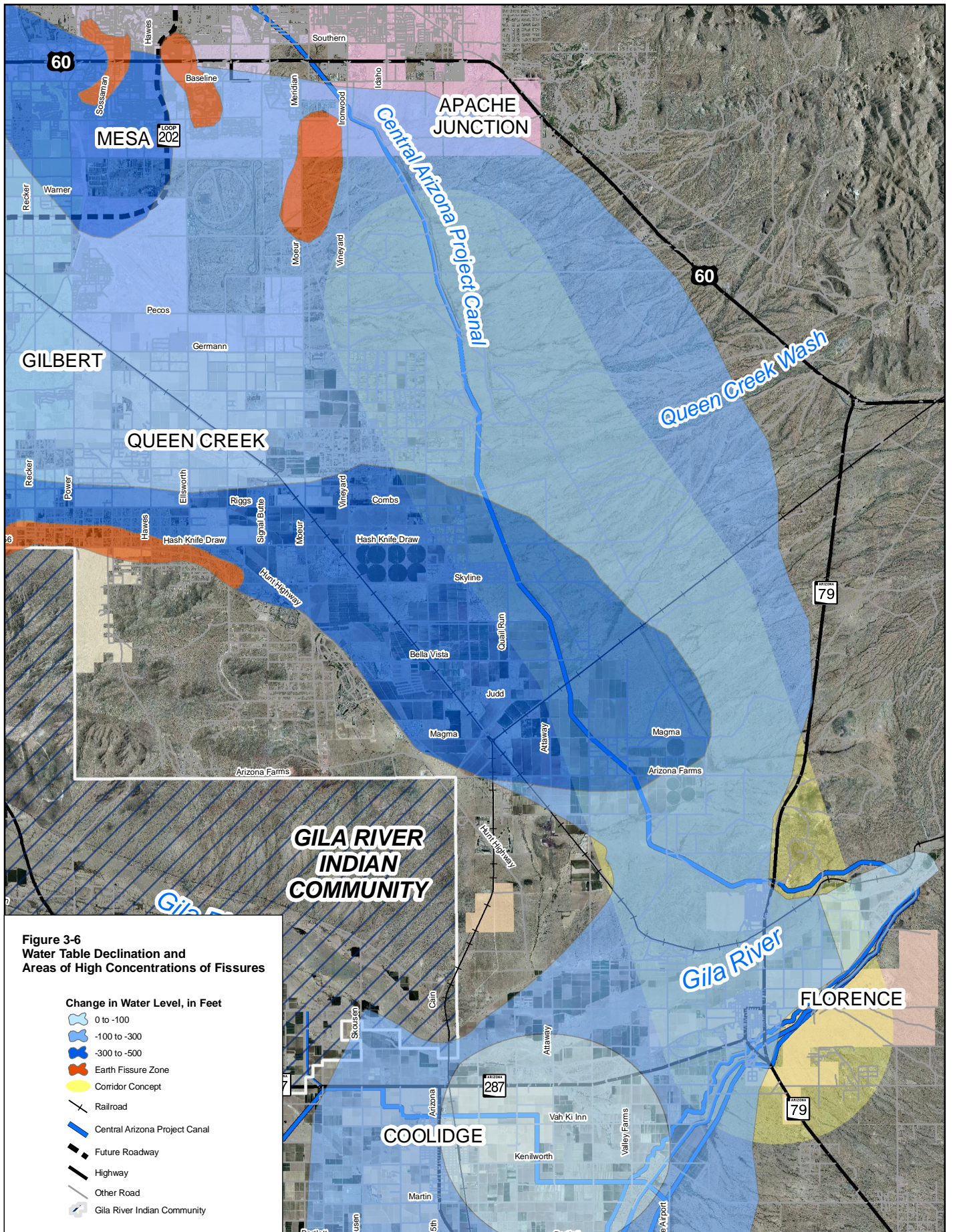






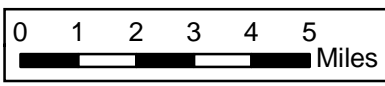


Figure 3-6
Water Table Declination and
Areas of High Concentrations of Fissures

Change in Water Level, in Feet

-  0 to -100
-  -100 to -300
-  -300 to -500
-  Earth Fissure Zone
-  Corridor Concept
-  Railroad
-  Central Arizona Project Canal
-  Future Roadway
-  Highway
-  Other Road
-  Gila River Indian Community

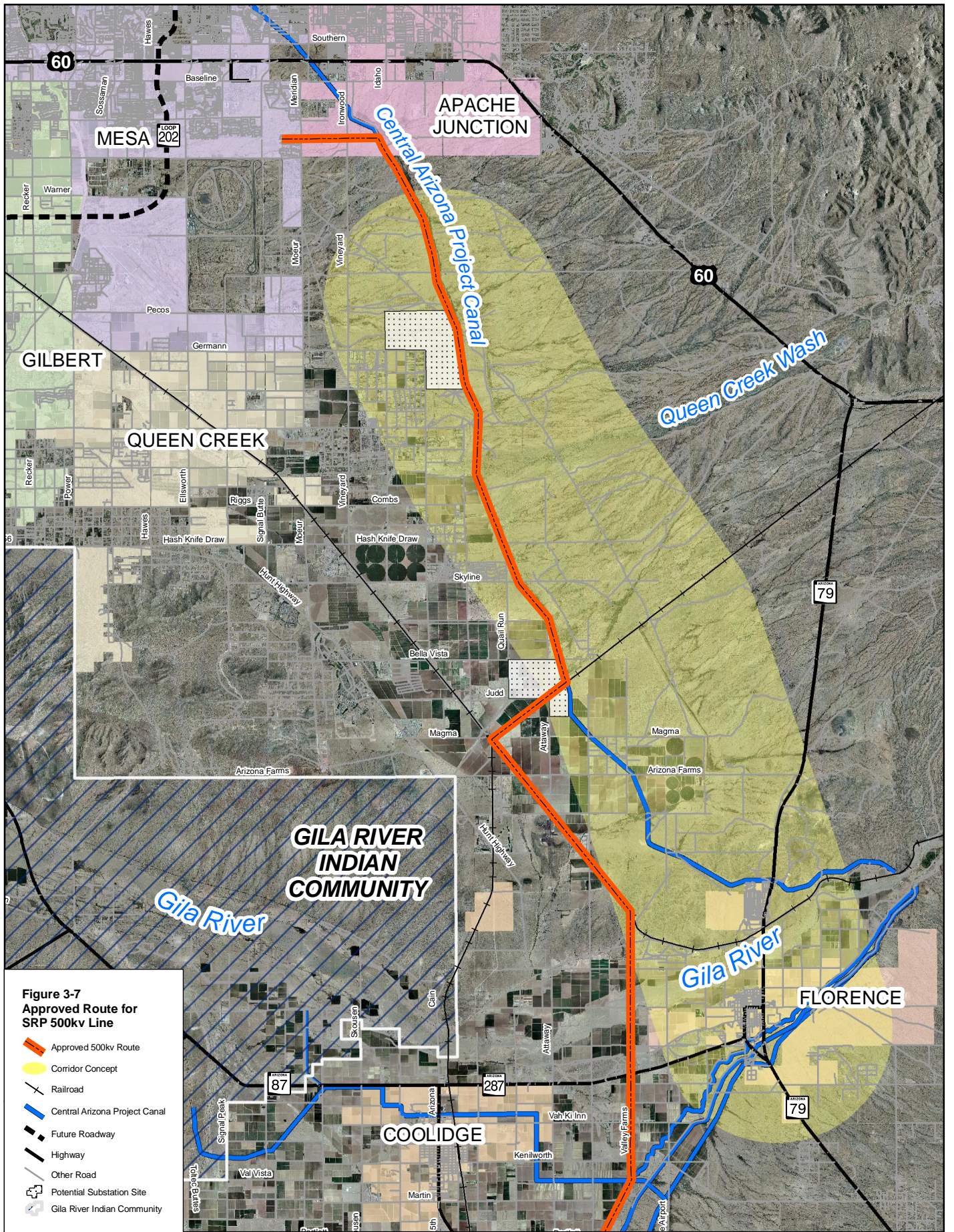


Data Source:
 Arizona Land Resource Information System









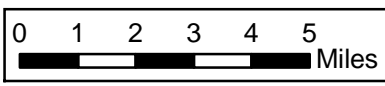
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**Figure 3-7
Approved Route for
SRP 500kv Line**

-  Approved 500kv Route
-  Corridor Concept
-  Railroad
-  Central Arizona Project Canal
-  Future Roadway
-  Highway
-  Other Road
-  Potential Substation Site
-  Gila River Indian Community

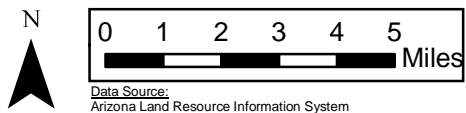
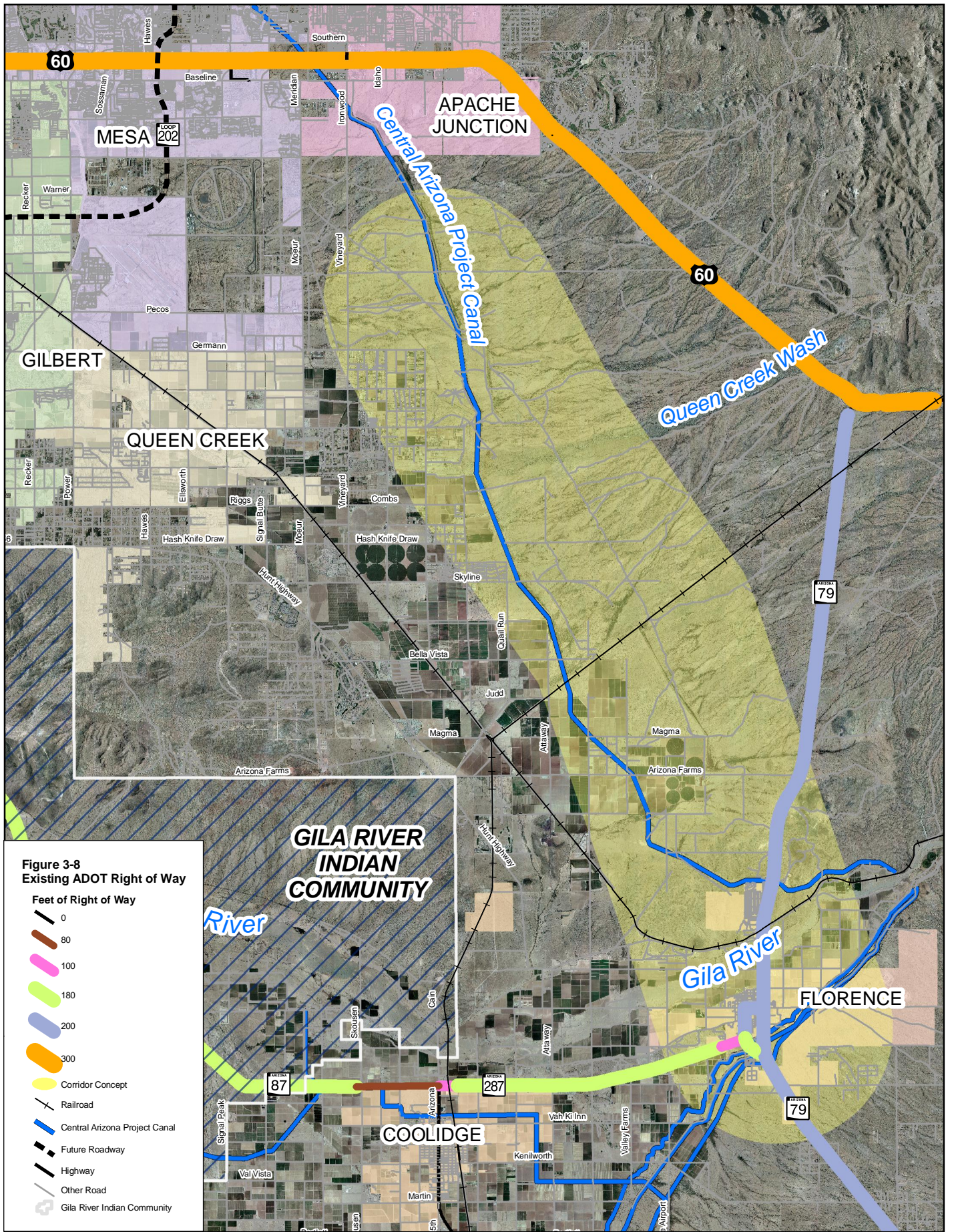


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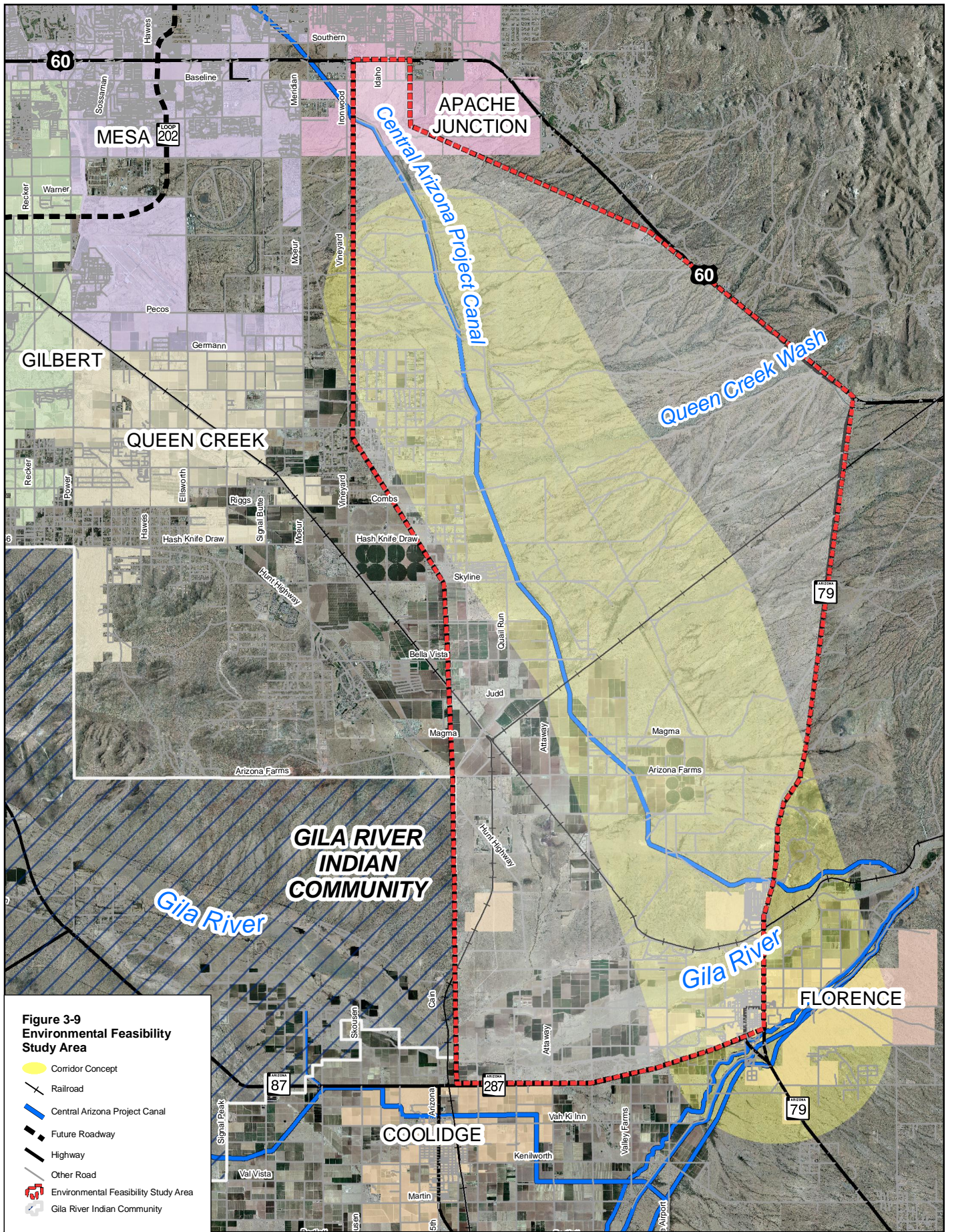
3.4 Social and Environmental Opportunities and Constraints

The purpose of the social and environmental feasibility analysis is to describe the existing social and environmental conditions within the proposed Pinal County Corridor Study Area, and to identify potential environmental concerns for future development of the Corridor Concept within the study area. Information presented within this environmental analysis is based on the existing data sources from local, county, state, and federal agencies. This analysis is not intended to meet the requirements of the National Environmental Policy Act (NEPA).

This analysis documents the socioeconomic environment, physical and natural environmental character, cultural resources, and section 4(f) resources of the Transportation Act in the study area. Existing environmental conditions within the study area have been evaluated to identify potential “fatal flaws,” obstacles, issues, and sensitive areas for future improvements. This analysis also addresses surveying, permitting, and agency coordination requirements that would need to be addressed in future studies prepared in accordance with NEPA.

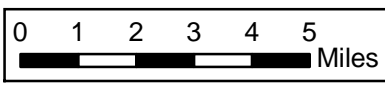
3.4.1 *Environmental Conditions Study Area*

For the purpose of the social and environmental feasibility analysis, the study area is defined roughly by US-60 on the north and northeast, SR-79 on the east, Ironwood Drive alignment and Attaway Road alignment on the west, and just south of SR-287 (Coolidge and Florence) on the south. The entire environmental feasibility analysis study area is within Pinal County, Arizona, and is shown in **Figure 3-9**, *Environmental Feasibility Study Area*.



**Figure 3-9
Environmental Feasibility
Study Area**

- Corridor Concept
- Railroad
- Central Arizona Project Canal
- Future Roadway
- Highway
- Other Road
- Environmental Feasibility Study Area
- Gila River Indian Community



Data Source:
Arizona Land Resource Information System



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3.4.2 Socioeconomic Conditions

Discussion of the socioeconomic environment of the study area includes an overview of the demographic composition of the area. Title VI and Environmental Justice considerations were identified using the U.S. Department of Commerce, Bureau of the Census 2000 Census of Population and Housing.

The demographic composition of the study area was calculated using the U.S. Department of Commerce, Bureau of the Census 2000. Census tracts and block groups within these tracts are large, relatively permanent statistical subdivisions that do not cross county boundaries. The size of the census tracts varies widely, depending on the density of settlement. Census tracts are delineated with the intention of being maintained over a long time, allowing statistical comparisons from census to census. Block groups are geographic subdivisions of census tracts; their primary purpose is to provide a geographic summary unit for census block data. A block group must comprise a reasonably compact and contiguous cluster of census blocks. Each census tract contains a minimum of one block group and may have a maximum of nine block groups. For the purposes of this analysis, the demographic composition is limited to census tracts. The study area lies within seven census tracts. The boundaries of some tracts extend beyond the study area; therefore, the exact population and demographic characteristics of the study area may vary from the represented census tract data. It is important to note that the greater Phoenix metropolitan area experiences significant seasonal changes in resident population, because many winter-only visitors populate various communities.

3.4.2.1 Race and Population

The four census tracts within the environmental feasibility study area contain 49,259 persons (2000 Census), the majority of whom are white with an average of 68 percent of the population throughout the seven census tracts (**Table 3-2, Figure 3-10a Socioeconomic /Census Data, Race**). Hispanic, which is considered an ethnicity rather than a race, represents the largest minority population with an average of 24 percent of the population throughout the seven census tracts. The percent minority populations within the study area are much lower than the average racial composition of Pinal County. The shaded numbers in **Table 3-3** indicate those percentages that are higher than those represented for the County.

3.4.2.2 Title VI/Environmental Justice Populations

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. “Executive Order 12898” on Environmental Justice, dated February 11, 1994, directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations.

“Executive Order 12898”, “Federal actions address minority populations and low-income populations”, reaffirms the principles of Title VI and related statutes. The Executive Order requires the consideration of low-income, minority, disabled, female, and elderly populations. A minority person refers to a person who is racially classified as Black or African American, American Indian or Alaska Native, Asian,



Native Hawaiian or Other Pacific Islander, or anyone who classifies himself or herself as “Other” or “Two or More Races.” Hispanics are also considered minorities regardless of their racial affiliation. Elderly refers to individuals 60 years of age or over. Low-income households include those families whose median household income is at or below the Department of Health and Human Services poverty guidelines. Noninstitutionalized civilians are considered disabled if they report a sensory disability, physical disability, mental disability, self-care disability, go-outside-home disability, or employment disability.

Title VI/Environmental Justice populations are relatively high within the study area (**Table 3-5. Figure 3-10b, Socioeconomic / Census Data Age 60 yrs and Older, Poverty, Disabled, and Female Head of Household**). Female heads of household in census tracts 2.02 and 9 are slightly higher than listed for the County. However, female heads of household in census tracts 3.06 and 10 are significantly higher than that of the County. The percentage of disabled individuals was also much higher within census tracts 3.06 and 10 than that for the County. The average percentage for low-income households within the study area is lower than the comparable percentage for the County. However, census tract 10 has a higher percentage of households below the poverty level. The percentage of elderly within study area is fairly consistent with that of the County. The percentage of elderly within census tract 3.06 is substantially higher than that for the County.

3.4.3.3 Existing Socioeconomic Environment Conclusions

The study area is predominantly White with an average 24 percent being Hispanic within the seven census tracts. The percentage of disabled individuals is much higher within census tracts 3.06 and 11 than in Pinal County. The average percentage for low-income households within the study area is lower than the comparable percentage for Pinal County, with the exception of census tract 10. The percentage of elderly within census tract 3.06 is much higher than that for Pinal County. The percentage of female head of household within census tracts 3.06 and 11 is much higher than that for Pinal County.

Table 3-2 – 2000 Population and Racial Demographics

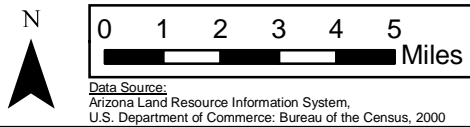
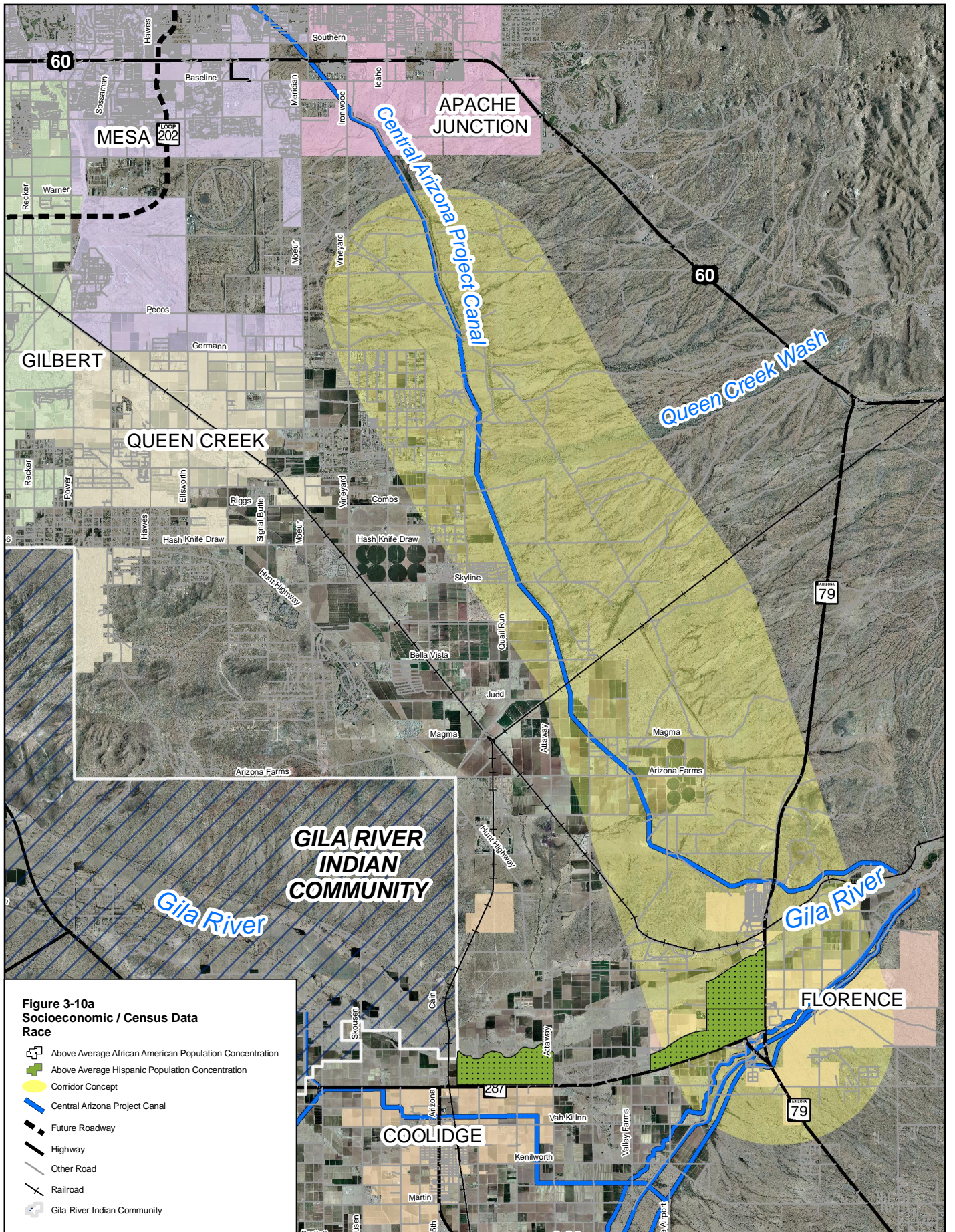
Area	Total Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Other (%)	Two or More Races (%)	Hispanic (%)
Pinal County	179,727	58.8	2.6	6.5	0.5	0.1	0.1	1.4	30.0
Census Tract 2.02	5,962	67.9	.69	0.7	0.4	0.3	--	1.1	28.9
Census Tract 3.06	7,585	91.5	.71	0.4	0.6	0.06	0.03	0.9	5.7
Census Tract 9	7,134	43.8	6.7	5.8	1.0	0.01	0.6	1.1	41.0
Census Tract 10	4,990	38.4	9.5	5.8	0.4	0.02	0.06	1.2	44.6

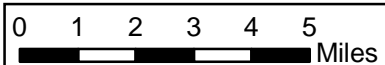
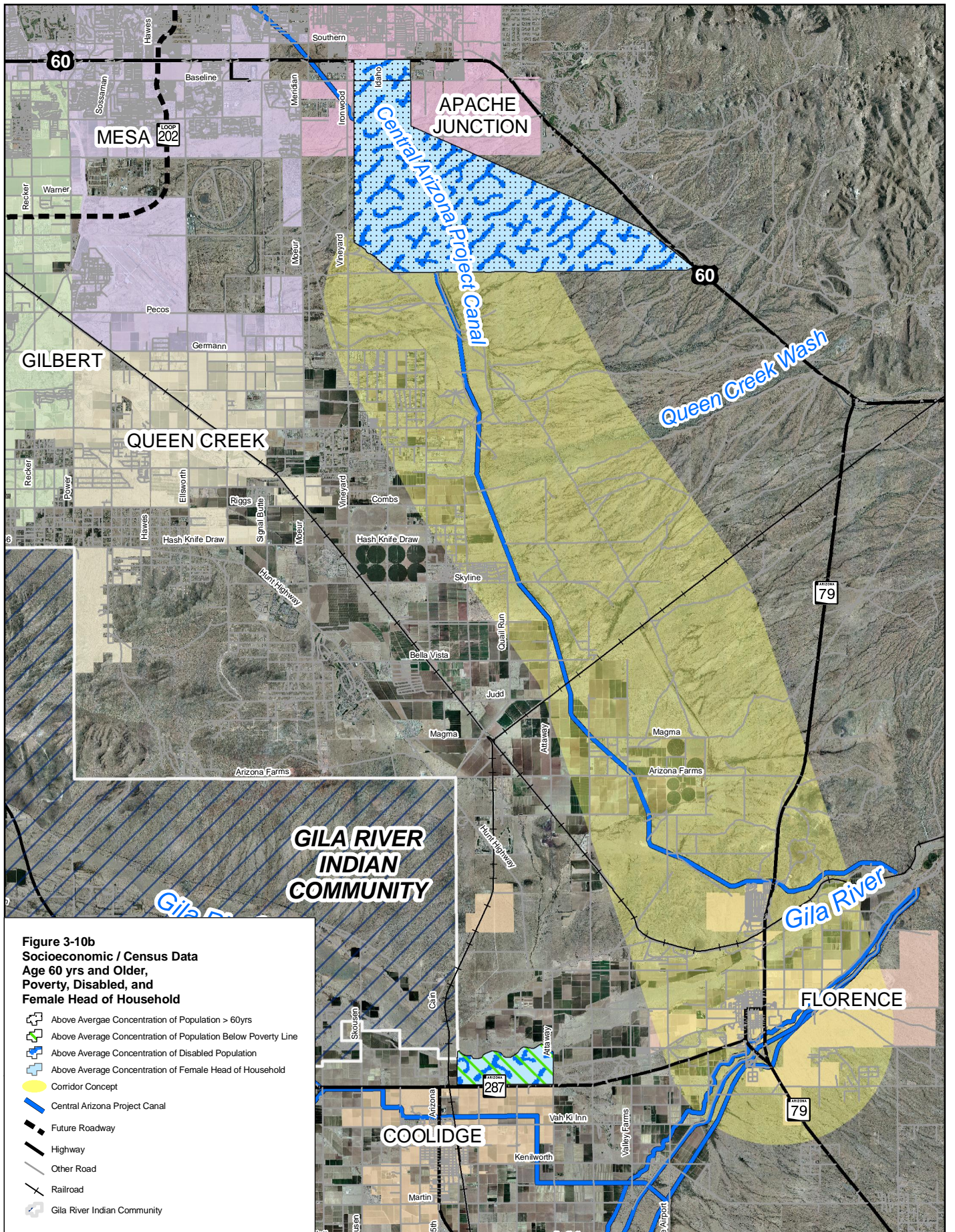
Source: U.S. Department of Commerce: Bureau of the Census, 2000. Census 2000 Summary File 1 (SF-1).

Table 3-3 – Age 60 Years and Over, Below Poverty Level, and Female Head of Household Populations

Area (Tract)	Age 60 Years and Over		Below Poverty Level		Disabled		Female Head of Household	
	Number	%	Number	%	Number	%	Number	%
Pinal County	38,665	21.5	27,816	16.9	35,207	22.9	8,086	4.9
Census Tract 2.02	699	11.7	720	12.2	1,677	28.1	440	7.4
Census Tract 3.06	4,085	53.8	647	8.5	3,679	48.5	987	13.0
Census Tract 9	530	7.4	339	9.3	1,345	18.8	564	8.0
Census Tract 10	777	15.6	1,564	31.5	2,616	52.4	617	12.4

Source: U.S. Department of Commerce: Bureau of the Census, 2000. Census 2000 Summary File 1 (SF-1)





Data Source:
 Arizona Land Resource Information System,
 U.S. Department of Commerce: Bureau of the Census, 2000



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3.4.3 Natural Environment

This section describes the existing natural environment within the study area in terms of wildlife, sensitive species, plants, water resources, visual character, air quality, noise, and hazardous material concerns. The inventory of the natural environment of the study area consisted of gathering data and information from various local, state, and federal agencies, including the Arizona Game and Fish Department (AGFD) and the U.S. Fish and Wildlife Service (USFWS). The characteristics of the natural environment were also identified based on a visual survey of the study area.

3.4.3.1 Biotic Communities

The study area east of the CAP is ecotonal between the Creosotebush-Bursage series of the Lower Colorado River Valley subdivision and the Paloverde-cacti-mixed scrub series of the Arizona Upland subdivision. Natural vegetation within the study area is depicted in **Figure 3-11, Natural Vegetation**.

Numerous washes occur throughout the project area and contain xeroriparian habitat that is dominated by paloverde, mesquite, and ironwood trees along with many different shrub species. The dominant vegetation in the upland portions of the project area is creosotebush and triangle-leaf bursage with scattered saguaros. These two different communities (creosotebush-bursage and paloverde-cacti-mixed scrub) contain a vast diversity of plant species unique to the Arizona desert. This vast diversity of plant species in return provide habitat for a vast diversity of wildlife that live here year round. The portion of the study area west of the CAP consists mostly of agricultural lands and developed lands that no longer contain undisturbed natural vegetation or habitats. However, there appear to be two pockets of undistributed natural vegetation occurring between Ranch View Road and the CAP canal and from Germann Road to US 60. This undisturbed natural vegetation is within the creosotebush-bursage community.

3.4.3.2 Wildlife

Although a large amount of land in the western portion of the study area has been converted to agricultural fields and has been developed, natural vegetation exist providing habitat and foraging opportunities for a variety of wildlife species. The eastern portion of the study area provides cover and foraging opportunities for wildlife due to the presence of native vegetation and ephemeral washes. Wildlife likely to be present within the study area includes but is not limited to various reptiles, small birds, and mammals such as cactus wren, curve-billed thrasher, Gambel's quail, mourning dove, cottontail rabbit, white-throated woodrat, coyote, whiptail lizard, and zebra-tailed lizard. In addition, the agricultural fields and developed lands themselves provide foraging opportunities for many bird species, from smaller species such as yellow-headed blackbirds and various sparrows, to larger birds such as red-tailed hawks.

3.4.3.3 Special Status Species and Critical Habitat

For purposes of this document special status species include those that are federally listed as threatened, endangered, proposed, and candidate for listing under the Endangered Species Act of 1973, as amended. A list of federally listed threatened, endangered, proposed, and candidate species as well as state-listed wildlife of concern in Arizona which may occur within the project area was prepared from

information provided by the AGFD and the USFWS. This list and a letter of correspondence from AGFD are provided in **Appendix B**.

The study area contains scattered ironwood, paloverde, and mesquite trees, but does not provide the density or structure known to support the cactus ferruginous pygmy-owl, or columnar cacti to provide foraging habitat for the lesser long-nosed bat. The proposed corridor also does not contain any perennial or intermittent streams or surface waters that would provide suitable habitat for the southwestern willow flycatcher, bald eagle, desert pupfish, Gila topminnow, loach minnow, razorback sucker, spokedace, Gila chub, Yuma clapper rail, yellow-billed cuckoo, or the California brown pelican. The project area does not contain suitable habitat for the Mexican spotted owl. The study area does not contain suitable habitat for the Arizona hedgehog cactus, Nichol Turk's head cactus, and the acuna cactus. It is recommended that a biological assessment and/or survey be completed to determine the potential affects to these species during the design phase for each future construction project.

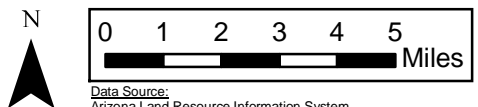
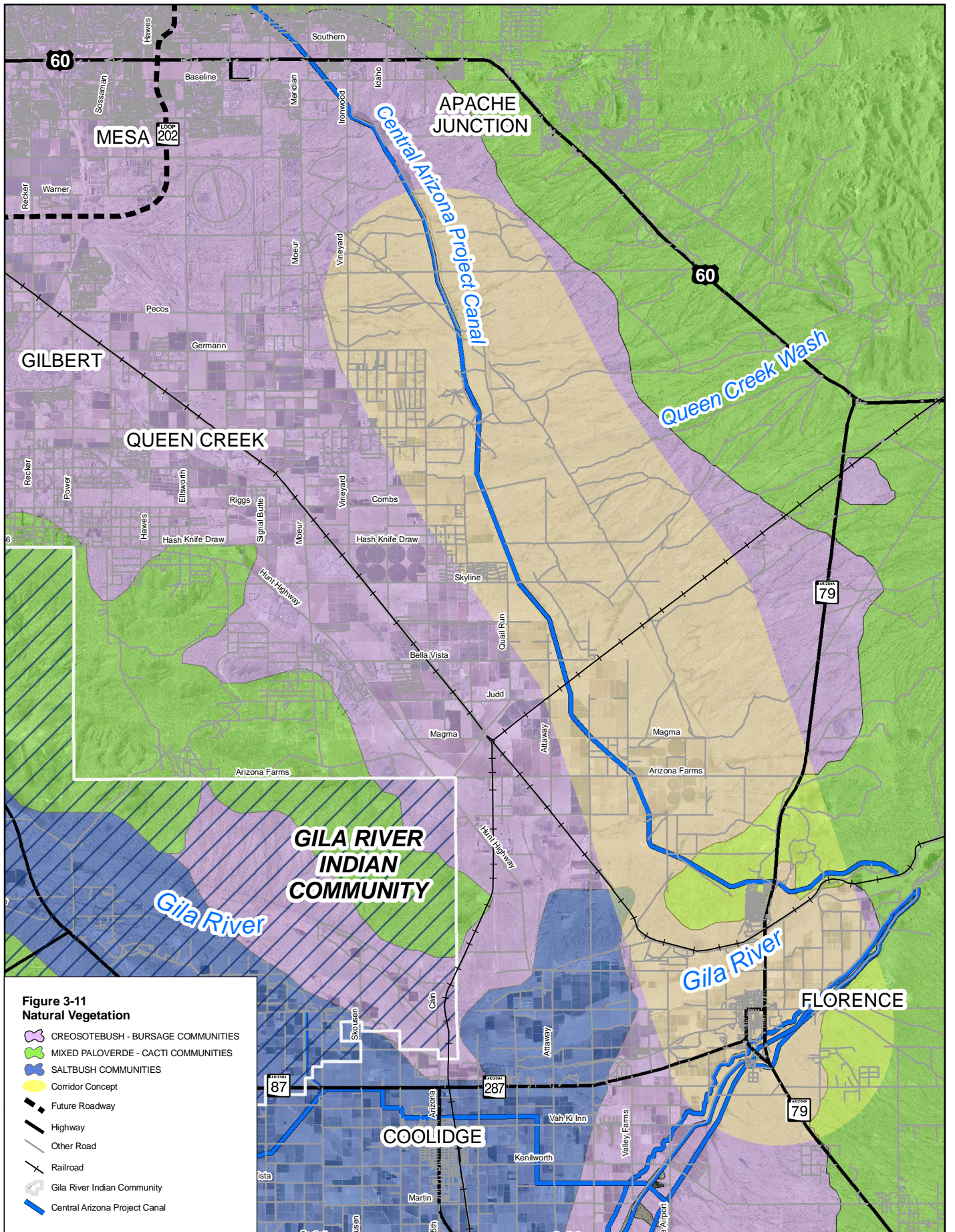
Critical habitat is the specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the Federal Register. Critical habitat only applies to federally listed endangered or threatened species. No designated critical habitat occurs within the study area for any of the species on the USFWS list. However, the cactus ferruginous pygmy-owl recovery team has identified habitat to the east of SR 79 and north of US 60 as a recovery zone.

The burrowing owl, protected under the Migratory Bird Treaty Act of 1918, is known to occur within the project area. The proposed corridor contains large areas of bare ground and vacant lots that provide suitable habitat for burrowing owls. Potential impacts to the burrowing owl should be evaluated during the environmental clearance process.

The Sonoran desert tortoise, an AGFD Wildlife of Special Concern in Arizona, is known to occur within two miles of the study area. The AGFD prepared guidelines for handling Sonoran desert tortoises for development projects in 1997.

3.4.3.5 Agricultural Lands

Agricultural lands compose the southern and western portions of the study area with scattered residences. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with a minimum input of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. A review of the U.S. Department of Agricultural Soil Surveys for Pinal County indicates that prime irrigated farmland exists within the study area. If federal funds are used for any roadway improvements that would require right-of-way acquisition, a farmland impact assessment may need to be performed in accordance with the Farmland Protection Policy Act.



Data Source:
Arizona Land Resource Information System



Kimley-Horn and Associates, Inc.



3.4.4 Visual Character

The visual character of the proposed project corridor is dominated by agricultural fields and residential development in the western portion of the study area and relatively undisturbed natural desert east of the CAP canal. Due to the low topographic relief, views throughout the study area of the surrounding mountains are unimpeded. Views of the surrounding encroaching subdivision development disrupt the rural setting along the study area.

3.4.4.1 Noxious Weeds

Invasive and noxious weeds are an increasing problem. Invasive and noxious weeds rapidly displace desirable plants that provide habitat for wildlife and food for people and livestock. Invasive and noxious weeds are plants that are not native to Arizona and were introduced accidentally or intentionally. Noxious weeds are listed by state and federal law and are generally considered those that are exotics and negatively impact agriculture, navigation, fish, wildlife, and public health. Since the 1900s, weedy annuals such as cheatgrass, Russian thistle, filaree, and tumble mustard have become established in areas where grazing has greatly reduced the native vegetation. Invasive weeds such as those listed previously can alter fire regimes.

Under Executive Order 13112, dated February 3, 1999, projects that occur on federal lands or are federally funded must be:

“subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: i) prevent the introduction of invasive species; ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; iii) monitor invasive species populations accurately and reliably; and iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded.”

For any proposed roadway project, a survey will be required by a qualified noxious weed authority to determine if any noxious weeds are present within the project boundaries.

3.4.4.2 Water Resources

The U.S. Army Corps of Engineers (ACOE) regulates the discharge of dredge and fill material into waters of the U.S. under Section 404 of the Clean Water Act. Any activity that will discharge dredge or fill material into jurisdictional waters, including wetlands, will require a Clean Water Act Section 404 Permit, following the completion of a jurisdictional delineation. A jurisdictional delineation is the process of identifying the characteristics and boundaries of waters of the U.S. within a given geographic area, and must receive final approval by the ACOE.

USGS 7.5 –minute quadrangles and aerial photographs of the study area were reviewed to determine if potential waters of the U.S. are present. There are ephemeral drainage systems within the study area, including Weeks Wash, Siphon Draw, Queen Creek, the Gila River, and multiple unnamed washes. In general, ephemeral drainage systems are determined by the ACOE to be jurisdictional waters.

If it is anticipated that work will take place within or adjacent to potential waters of the U.S., a jurisdictional delineation for the project area should be completed and

submitted to the ACOE for concurrence. Following ACOE-approval of the jurisdictional delineation, the project should be reviewed to determine if a Section 404 permit is necessary. Activities that may require a permit include, but are not limited to, construction of new roads, widening of existing roads, construction or expansion of bridges, installation of corrugated-metal pipe and concrete box culverts, installation of riprap, and maintenance activities within a drainage system.

If impacts are expected to be below 0.5 acre for each water of the U.S. (i.e. each individual wash system), a Nationwide Permit Number 14 would likely be required. If impacts at a single crossing or to any individual drainage system exceed 0.1 acre, pre-construction notification must be provided to the ACOE, and the project must be authorized by the ACOE prior to the start of construction. If impacts at a single crossing or to any individual drainage system do not exceed 0.1 acre, pre-construction notification is generally not required, but may be required if a “may effect” determination is made for a threatened or endangered species and/or the presence of any historic property determined to be eligible, or which may be eligible, for listing on the National Register of Historic Places is identified. If impacts at any single crossing or to any individual drainage system exceed 0.5 acre, a Section 404 Individual Permit would be required. The Individual Permit process requires a more detailed permit application, and the ACOE review period is typically much longer than that of a Nationwide Permit.

Improvements within or near waters of the U.S. require Section 401 Water Quality Certification. In certain cases, projects are Conditionally Certified and it is not necessary to submit an application for certification to the Arizona Department of Environmental Quality; however, the Section 401 conditions listed in the applicable Section 404 permit must be adhered to in order to qualify for Conditionally Certified. Linear transportation projects are generally Conditionally Certified.

The National Pollutant Discharge Elimination System is a national program under Section 402 of the Clean Water Act that regulates discharges of pollutants from point sources into waters of the U.S. Arizona has been delegated authority from the U.S. Environmental Protection Agency to implement the permit program within the state. The state program is referred to as the Arizona Pollutant Discharge Elimination System (AZPDES). The AZPDES permit program requires an AZPDES general permit for construction activities that disturb one or more acres of land. A Stormwater Pollution Prevention Plan must be prepared as a part of the permit.

A review of Federal Emergency Management Agency Flood Insurance Rate Maps indicates 100-year floodplains are located along major drainage systems within the study area.

3.4.5 *Air Quality Analysis*

The Clean Air Act (CAA) Amendments and NEPA require that air quality impacts be addressed in the preparation of environmental documents. The level of effort used to evaluate these impacts may vary from a simplified description to a detailed analysis depending on factors, such as the type of document to be prepared, the project location and size, the air quality attainment status of the area, and the state air quality standards. Under the CAA, areas are classified for the degree of ambient air pollution existing at the time of

the 1990 amendments as to whether they attain the NAAQS or are in nonattainment of the standards as described below.

As required by the CAA, NAAQS have been established for the following major air pollutants: carbon monoxide, hydrocarbons, nitrogen dioxide, ozone, particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), sulfur dioxides, and lead. Carbon monoxide is a colorless, odorless gas that affects the cardiovascular system. Vehicular emissions are a major source of carbon monoxide. Ozone is created through a complex reaction of hydrocarbons and oxides of nitrogen with sunlight as a catalyst. Ozone affects the respiratory system; and vehicle emissions, power plants, and service stations are major sources. High concentrations of ozone are common in the Phoenix area during the summer. Nitrogen dioxide is a gas with a yellowish orange to reddish brown appearance, depending on its concentration, which impairs the respiratory system. Major sources of nitrogen dioxide are power plants and vehicle emissions. Particulate matter refers to small aerosols that may cause irritation and damage to the respiratory system. Vehicle emissions and the resuspension of road dust by vehicular activity are common sources. Sulfur dioxide is a colorless gas frequently derived from the combustion of sulfur-containing fuels. It primarily affects the respiratory system and major sources are coal- and oil-fired power plants. Lead and its compounds damage the cardiovascular, renal, and nervous systems. The primary source of lead is vehicular emissions associated with the use of leaded gasoline. These standards have also been established as the official ambient air quality standards for the state of Arizona. The “primary” standards have been established to protect the public health. The “secondary” standards are intended to protect the nation’s welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare.

In 1987, the standard for particulate matter was revised by EPA from total suspended particulate matter, which are aerosols with diameters ranging from up to approximately 45 microns in size, to those aerosols with aerodynamic diameters of 10 microns or less. This new standard is referred to as PM_{10} .

In July 1997, EPA revised the standards for both particulate matter and ozone. EPA revised the PM_{10} standard, added standards for particulates with diameters of $PM_{2.5}$, and also revised the method for the determination of exceedences. For ozone, the 1-hour standard was replaced with an 8-hour standard. In addition, the standard for concentration of ozone was lowered from 0.12 ppm to 0.08 ppm, and the method for the determination of exceedences was also revised. The effective date of those final rules was September 16, 1997.

3.4.5.1 Nonattainment Areas

The CAA Amendments of 1990 authorized the EPA to designate areas as nonattainment, and to classify them according to their degree of severity. This classification initiates a set of control requirements designed to achieve attainment by a specified date. A nonattainment area is an area in which compliance with the NAAQS has not been established for one or more pollutants. States that fail to attain the NAAQS for any of the criteria pollutants are required to submit State Implementation Plans, which outline those actions that will be taken to attain compliance. The northern portion of the study area at US 60 is located within the nonattainment area for PM_{10} .

3.4.5.2 Conformity

Since 1977, federal agencies and Metropolitan Planning Organizations have been required by Section 176c of the CAA to ensure that all transportation projects conform to the approved air quality State Implementation Plans. The CAA enacted in 1990 defined conformity to a State Implementation Plan as meaning conformity to a State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS. The conformity determinations for federal actions related to transportation projects must meet the requirements of Title 40 of the Code of Federal Regulations (CFR) Parts 51 and 93.

Portions of the Pinal County Corridor study area is in air nonattainment areas for PM₁₀, which have transportation control measures in the State Implementation Plans and Federal Implementation Plan. A given individual project will need to be included in an approved transportation improvement plan for at least one year, and no more than three years, prior to construction. That Transportation Improvement Plan will have to be approved by the Federal Highway Administration and EPA as conforming to the State Implementation Plan, and the Federal Implementation Plan will have to conform.

During a construction project, disturbance of the soil by heavy equipment would increase fugitive dust and, if uncontrolled, would affect local air quality. In addition, construction-related traffic delays, combined with exhaust emissions from constructed-related equipment, may elevate levels of pollutants. Such impacts would be temporary and would be eliminated once construction is complete. Any construction activity located within Maricopa County must adhere to the local air quality rules and ordinances, including Maricopa County Rules 310 and 310.01.

3.4.6 Noise

Noise, defined as unwanted or excessive sound, is an undesirable by-product of our modern way of life. While noise emanates from many different sources, transportation noise is perhaps the most pervasive and difficult source to avoid in society today. The Federal-Aid Highway Act of 1970 mandates the FHWA to develop noise standards for mitigating highway traffic noise. The FHWA regulations for mitigation of highway traffic noise in the planning and design of federally aided highways are contained in Title 23 of the United States Code of Federal Regulations Part 772. The regulations require the following during the planning and design of a highway project: 1) identification of traffic noise impacts; examination of potential mitigation measures; 2) the incorporation of reasonable and feasible noise mitigation measures into the highway project; and 3) coordination with local officials to provide helpful information on compatible land use planning and control. The regulations contain noise abatement criteria, which represent the upper limit of acceptable highway traffic noise for different types of land uses and human activities. The regulations do not require that the abatement criteria be met in every instance. Rather, they require that every reasonable and feasible effort be made to provide noise mitigation when the criteria are approached or exceeded.

ADOT has adopted a State Policy, the *Noise Abatement Policy for Federal Aid Projects*, which is consistent with FHWA policy. These policies outline noise impacts. A traffic noise impact occurs when either of the following condition occurs:

- § The predicted traffic noise level approaches or exceeds the noise abatement criteria shown in **Table 3-4**. ADOT defines approach as being 3dBA below the appropriate NAC.
- § The predicted traffic noise level substantially exceeds the existing noise level. ADOT defines substantial in this context as 15dBA or greater.

Table 3-4 – Noise Abatement Criteria

Activity Category	Description	Leq(h)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.	57 dBA (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 dBA (exterior)
C	Developed lands, properties, or activities not included in Categories A or B	72 dBA (exterior)
D	Undeveloped lands.	None
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 dBA (interior)

Source: Title 23, CFR Part 772

If potential traffic noise impacts are identified, noise abatement is considered and implemented, if it is found to be both reasonable and feasible. The views of the impacted residents are a major consideration in reaching a decision on the reasonableness of abatement measures to be provided. When noise abatement measures are being considered, every reasonable effort is made to obtain substantial noise reductions. Substantial noise reductions have been defined by State highway agencies to typically range from 5 to 10 dBA.

Highway construction noise is often viewed by the public as being short term and a necessary price for growth and improvement. Highway construction noise should generally be addressed in a qualitative, rather than quantitative, manner commensurate with the scope of the highway project. Construction noise levels may be predicted, if warranted. If potential construction noise impacts are identified, a common sense approach should be utilized to incorporate appropriate abatement measures into the highway project.

3.4.7 Hazardous Materials

A search was performed of hazardous materials (hazmat) databases and lists made available by the Arizona Department of Environmental Quality (ADEQ) for evidence of potential hazmat concerns within or immediately adjacent to the study area. The following ADEQ resources were utilized:

- § Underground Storage Tank Database
- § Leaking Underground Storage Tank Database

- § Hazardous Material Incident Logbook Database
- § Superfund Programs Section website, included search for National Priority List, Water Quality Assurance Revolving Fund (WQARF) and potential WQARF, and Department of Defense sites
- § Arizona Hazardous Waste Treatment, Storage, and Disposal Facilities List

3.4.7.1 Underground Storage Tanks

The results of the underground storage tank (UST) database search indicate that thirty-eight sites with UST records are located within or immediately adjacent to the study area. The results are summarized in the **Table B-1** in **Appendix B**.

3.4.7.2 Leaking Underground Storage Tanks

The results of the leaking underground storage tank (LUST) database search indicate that sixteen sites with LUST case files are located within or immediately adjacent to the study area. The results are summarized in **Table B-2** in **Appendix B**.

3.4.7.3 Hazardous Material Incident Logbook

Eighteen hazardous material incidents occurred within or immediately adjacent to the study area, as recorded in the *Hazardous Material Incident Logbook*. The records are summarized in the **Table B-3** in **Appendix B**.

3.4.7.4 Superfund Sites

According to the ADEQ Superfund Programs Section, no National Priority List, WQARF, potential WQARF, or Department of Defense sites are located within 1 mile of the study area.

3.4.7.5 Treatment, Storage, and Disposal Facilities

According to the *Arizona Hazardous Waste Treatment, Storage, and Disposal Facilities List*, no hazardous waste treatment, storage, or disposal facilities are located within or immediately adjacent to the study area.

3.4.7.6 Other Environmental Sites

Two landfills are located within the study area according to Pinal County's Public Works website. Apache Junction Landfill (4050 South Tomahawk Rd, Apache Junction) is located in the northern portion of the study area; Ironwood Landfill (12720 Hwy 287, Florence) is located in the southern portion.

3.4.8 Section 4(f) of the Transportation Act

Section 4(f) of the Department of Transportation Act of 1966 stipulates that Federal Highway Administration may not approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site that is either listed, or eligible for listing on the Register under the following Criterion stated in 49 U.S.C., Section 303:

- (a) "It is the policy of the United States Government that special effort be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

(b) The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agricultural, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities.

(c) The Secretary may approve a transportation program or project requiring the use of publicly owned land or a public park, recreation area, or wildlife and waterfowl refuge, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if-

- 1) There is no prudent and feasible alternative to using that land; and
- 2) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

The study area does not contain any publicly owned park, recreation area, or wildlife and waterfowl refuge. However, entrances to these types of facilities do exist off the project corridor. Therefore, future coordination with the appropriate agencies and departments is recommended at the entrances to these facilities.

3.4.10 Cultural Resources

An archaeological assessment and cultural resources overview was performed for the environmental feasibility study area⁹. The purpose of the overview was to identify any cultural resources sites that would significantly impact the definition of the future corridor. The full text of the *Archaeological Assessment and Cultural Resources Overview* is not included in this report but is available separately. An over-view of areas that have been identified as containing a high concentration of cultural resources is depicted in **Figure 3-12, Cultural Resources**.

Nearly 100 archaeological survey projects have identified 230 archaeological sites that are listed on the AZSite database and 31 properties that are listed on the NRHP. The prehistoric and historic site that have been identified in the study area range from surface scatters of prehistoric artifacts to large Hohokam village complexes along Queen Creek and the Gila River that contain thousands of significant features and represent some of the largest prehistoric site complexes in central Arizona. Historic sites in the study area represent transportation corridors (roads and railroads), mining, farming, and homesteading activities of the past century in the region. Individual properties listed on the NRHP include historic buildings and a historic district in the Town of Florence and the prehistoric and historic Adamsville site complex west of Florence.

The previous surveys listed in the AZsite database date from 1971, and are all the result of compliance driven clearance surveys associates with state and federal legislation that protect cultural resources. Many of the 239 individual sites in the AZSite database have been determined to be eligible or not eligible to the NRHP and have been either investigated through controlled excavation projects such as the Salt-Gila Aqueduct project and the Escalante Ruin Project, or they have been avoided by construction and development projects and thus have been preserved.

⁹ An Archeological Assessment and Cultural Resources Overview of the Pinal County Transportation Corridors Definition Study Area in Northern Pinal County, Arizona. Soil Systems Technical Report No. 05-32. July, 2005.

The density and diversity of the cultural resources in the study area is high. Although only a small portion of the entire study area has been systematically surveyed, patterns of site distribution can be observed based on the existing data. The Queen Creek floodplain and the Gila River corridor are the areas of highest site density. The largest prehistoric habitation sites are clustered along these waterways. Historic resources are clustered along the Gila River and the existing transportation corridors that follow the historic wagon roads and the modern highways and railroads.

As residential and commercial development spreads into northern Pinal County, and as transportation corridors are constructed to service the rapidly growing population, compliance with existing state and federal legislation concerning cultural resources must be part of the planning process. The Corridor Concept and the North-South corridor in particular, will have to contend with the high site densities along Queen Creek and the Gila River that cut east to west across the study area. East to west transportation corridors through the study area will encounter cultural resources, but the number and significance of the cultural resources will be less than in the area between the Queen Creek floodplain and an area 2 miles north of the Gila River and the area north of the Queen Creek floodplain.

It is expected that any transportation corridors selected across the study area will require additional archaeological survey. The site density in the study area indicates that significant archaeological sites eligible to the NRHP will be present. Furthermore, it is estimated that at least 50 percent of any newly recorded archaeological sites will require testing and/or data recovery investigations to mitigate the potential impacts related to the construction of the new transportation corridors. However, the CAP right-of-way has already been cleared of cultural resources. Construction of the North-South corridor parallel to the CAP right-of-way could minimize costly cultural resources clearance. Regardless, compliance with cultural resources laws will be a substantial component of any transportation corridor that is selected. The costs, particularly along the Gila River, will be substantial. Cultural resources clearance and compliance with existing legislation requires adequate lag-time that must be factored into the planning process.

3.4.11 Summary of Environmental Opportunities and Constraints

This section contains a summary of the social and environmental issues that should be considered during future corridor development. A summary of environmental opportunities and constraints is presented in **Table 3-5**.

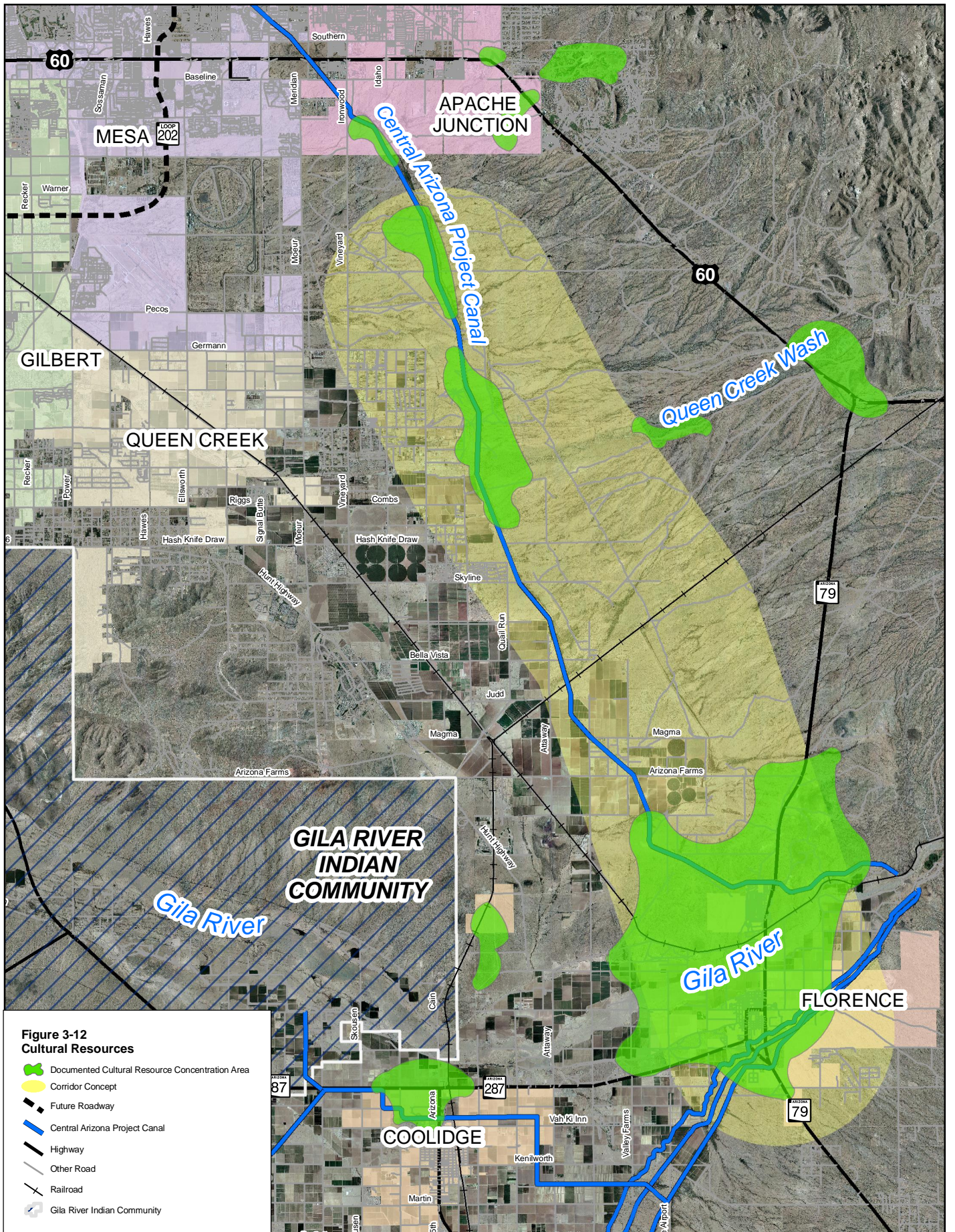
- § During the Design Concept Report or Final Design new scoping letters should be submitted to the AGFD and USFWS and a biological evaluation should be completed to determine the potential affects to threatened and endangered species.
- § It may be necessary to conduct a survey for burrowing owls and Sonoran desert tortoise.
- § For any proposed roadway project, a survey will be required by a qualified noxious weed authority to determine if any noxious weeds are present within the project boundaries.
- § A jurisdictional delineation would need to be conducted to determine waters of the United States.
- § A Section 404 Permit would be required if the project impacts waters of the United States.
- § A noise analysis would be required if the proposed roadway is located near noise receptors.

- § If new right-of-way is to be acquired for future construction, a Phase I Environmental Site Assessment should be conducted to determine if potential hazmat concerns are Recognized Environmental Conditions.
- § During the Design Concept Report or Final Design, the demographic composition and Title VI/Environmental Justice should be reevaluated and block groups be included in this reevaluation.
- § The density and diversity of the cultural resources in the study area is high. Although only a small portion of the entire study area has been systematically surveyed, patterns of site distribution can be observed based on the existing data. The Queen Creek floodplain and the Gila River corridor are the areas of highest site density.
- § The Corridor Concept and the North-South corridor in particular, will have to contend with the high site densities along Queen Creek and the Gila River that cut east to west across the study area.
- § Furthermore, it is estimated that at least 50 percent of any newly recorded archaeological sites will require testing and/or data recovery investigations to mitigate the potential impacts related to the construction of the new transportation corridors.
- § The CAP right-of-way has already been cleared of cultural resources.



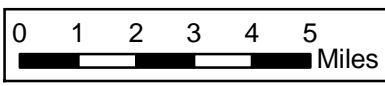
Table 3-5 – Summary of Environmental/Social Opportunities and Constraints

Corridor Definition Alternative	Environmental/Social Opportunities	Environmental/Social Constraints
<p>North-South corridor from Williams Gateway Corridor (Frye Rd. alignment) to Arizona Magma Railroad near Judd Rd</p>	<ul style="list-style-type: none"> The CAP right-of-way has already been cleared of cultural resources. Construction of the corridor to the west of the CAP would have the least amount of environmental impacts, as the area to the east of the CAP remains largely undisturbed and thus provides more suitable habitat for wildlife and biotic communities. 	<ul style="list-style-type: none"> The density and diversity of the cultural resources in the study area is high. Although only a small portion of the entire study area has been systematically surveyed, patterns of site distribution can be observed based on the existing data. The Queen Creek floodplain and the Gila River corridor are the areas of highest site density. A connection that crosses, or approaches the Gila River will encounter a significant number of cultural resources. 38 sites with underground storage tanks (UST) records are located within or immediately adjacent to the study area. The results are summarized in the Table B-1 in Appendix B. The results of the leaking underground storage tank (LUST) database search indicate that sixteen sites with LUST case files are located within or immediately adjacent to the study area. The results are summarized in Table B-2 in Appendix. Eighteen hazardous material incidents occurred within or immediately adjacent to the study area, as recorded in the Hazardous Material Incident Logbook. The records are summarized in the Table B-3 in Appendix B. Two landfills are located within the study area. Apache Junction Landfill (4050 South Tomahawk Rd, Apache Junction) is located in the northern portion of the study area; Ironwood Landfill (12720 Hwy 287, Florence) is located in the southern portion. The burrowing owl is known to occur within the project area. Potential impacts to the burrowing owl should be evaluated during the environmental clearance process. The Sonoran desert tortoise, an AGFD Wildlife of Special Concern in Arizona, is known to occur within two miles of the study area. A review of the U.S. Department of Agricultural Soil Surveys for Pinal County indicates that prime irrigated farmland exists within the study area. If federal funds are used for any roadway improvements that would require right-of-way acquisition, a farmland impact assessment may need to be performed in accordance with the Farmland Protection Policy Act. Populations considered in Title VI are relatively high within the study area. Additional considerations should be given to Title VI populations as the corridor is developed. A Section 404 Permit would be required if the project impacts waters of the United States.
<p>Southern Connection Alternative 1: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-79</p>		
<p>Southern Connection Alternative 2: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-287 near Valley Farms Road.</p>		



**Figure 3-12
Cultural Resources**

- Documented Cultural Resource Concentration Area
- Corridor Concept
- Future Roadway
- Central Arizona Project Canal
- Highway
- Other Road
- Railroad
- Gila River Indian Community



Data Source:
Arizona Land Resource Information System



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3.5 Land-Use Compatibility Opportunities and Constraints

This section documents land-use compatibility opportunities and constraints associated with the corridor definition alternatives.

Land use compatibility criteria include issues of corridor compatibility with jurisdictional development and local land use plans. An outcome of this analysis is how the Corridor Concept alternatives fit with adopted transportation and land use plans and what – if incompatibilities are identified – how adopted transportation and land use plans must be modified to accommodate the corridors.

3.5.1 *Land Jurisdiction and Ownership*

Land jurisdiction refers to the authority to regulate land uses. Land ownership is identified as public or private ownership. The study area contains property within portions of unincorporated Pinal County, as well as land areas currently incorporated into the communities of Apache Junction and Florence. Apache Junction land area occupies the northern portion of the study area. Further to the south, the Town of Florence provides land jurisdiction. The middle portion of the study area consists of unincorporated Pinal County that is made up of State Trust land. However, there are substantial “gaps” of unincorporated Pinal County land located in this region of the study area (**Figure 3-6, Land Ownership**).

The study area contains two land parcels owned by the by the United States Department of Defense. The first parcel is bounded on the north by Arizona Farms Road, on the south by the Copper Basin Railroad. The parcel extends 1-mile to the east of SR-79. The second military parcel is located adjacent to the CAP canal and bounded by Ocotillo Road alignment on the north, Pima Road alignment on the south, Tomahawk Road alignment on the west, and Goldfield Road alignment on the east. The Rittenhouse Auxiliary Field (closed) is located within the study area north of Queen Creek.

The Bureau of Land Management controls several land parcels within the study area, most of which are located adjacent to the CAP. Pinal County also owns large tracts of land located adjacent to the San Tan Regional Mountain Park.

3.5.2 *Existing Land Use*

Both alternative corridor definitions (connection to SR-79 and a connection to SR-287) will impact to some degree currently planned residential developments and master planned communities. A corridor connection to SR-79 affords the most opportunity to minimize wide-scale impact to existing and future master planned communities. In fact, a corridor definition could potentially be identified that would bypass most, if not all, of these communities.

A corridor connection to SR-287 provides fewer opportunities to avoid wide-scale impact to future master planned communities and residential development. However, collocation of the North-South corridor with the SRP 500 kV line could consolidate the infrastructure that would require mitigation, and provide less-overall impact to future development than would a transportation corridor on a separate alignment.

3.5.3 Summary of Land Use and Local Jurisdiction Perspectives Opportunities and Constraints

A summary of opportunities and constraints from a land-use and local jurisdiction perspective is presented in **Table 3-6**.

Table 3-6 – Summary of Land-use and Local Jurisdictions Opportunities and Constraints

Corridor Definition Alternative	Land Use and Local Jurisdictions Perspectives Opportunities	Land Use and Local Jurisdictions Perspectives Constraints
<p>North-South corridor from Williams Gateway Corridor (Frye Rd. alignment) to Arizona Magma Railroad near Judd Rd</p>	<ul style="list-style-type: none"> • Agency and stakeholders have expressed support for collocation of the corridor with the CAP, to the extent feasible, to create a 'transport and utility corridor'. This corridor would also include the 500 kV line, and the railroad in some segments. This provide the following benefits: <ul style="list-style-type: none"> - Bisects the study area and serves future developments both east and west of the CAP. - Provides opportunity to integrate land use and freeway concepts on currently undeveloped State Trust Land. ASLD is interested in identifying potential locations of interchanges to integrate into their planning concepts. - Minimizes mitigation required as compared to separate power line and transportation corridors. • The majority of the corridor definition alternative is located on State Trust Land. This provides the opportunity for ADOT to identify and purchase right-of-way in advance of development. • Arizona State Land Department is currently conducting an infrastructure planning study for the Superstition Vistas and Lost Dutchman Heights areas. • Location of the North-South corridor on the west side of the CAP is consistent with ASLD land use plans. • This facility is consistent with Pinal County perspectives and plans. Pinal County is interested in combining the corridor with a linear trail system. • Terminus of freeway facility at Williams Gateway corridor is consistent with City of Apache Junction plans to develop a parkway facility through a commercial area that connects to the US 60. 	<ul style="list-style-type: none"> • The US Bureau of Reclamation owns significant parcels of land that are located mostly on the east side of the CAP. In addition, large drainage and flood control easement exists on the east side of the CAP, limiting corridor opportunities directly to the east of the CAP. • The United States Military owns two parcels within the study area: <ol style="list-style-type: none"> 1) Florence Military Reservation is generally bounded on the north by Arizona Farms Road, on the south by the Union Pacific/Copper Basin Railroad. The parcel extends 1-mile to the east of SR-79. 2) Rittenhouse Auxiliary Airfield is located adjacent to the west side of the CAP and bounded by the Ocotillo Rd alignment on the north, Pima Rd alignment on the south, Tomahawk Rd alignment on the west, and Goldfield Road alignment on the east. • Because most of the corridor definition is located on State Trust Land, arterials to provide access to and from the corridor will likely not be developed until the ASLD land is sold for development. • Access to the corridor from the east side of the CAP will require crossings to be constructed. • While a corridor alignment can ultimately be identified that would minimally impact existing and proposed residential development, the following master planned communities may be impacted: <ul style="list-style-type: none"> - Castlegate - Lorado Ranch - Quail Run Estates - Bella Vista - Sonoran Village



**Table 3-6 – Summary of Land-use and Local Jurisdictions Opportunities and Constraints
(continued)**

Corridor Definition Alternative	Land Use Opportunities	Land Use Constraints
<p>Southern Connection Alternative 1: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-79</p>	<ul style="list-style-type: none"> • A connection to SR-79 is more consistent with goals and objectives of the Town of Florence. A definition could be identified that would minimally impact proposed master planned communities. • This alternative provides some opportunity to identify an alignment to minimize impact to existing and proposed master planned communities. • Magma Dam/Flood Retarding Structure may provide opportunities for corridor alignment. The NCRS recently retained a consultant to evaluate the condition of the structures. If it is determined that the structure requires reconstruction, corridor facility may be considered in the design. 	<ul style="list-style-type: none"> • A new hospital is planned south of Hunt Highway, south of Main Street in Florence. Corridor definition would need to circumvent this facility. This alternative may also significantly impact Arizona Department of corrections facilities located on SR-79. • While a corridor alignment can ultimately be identified that would minimally impact existing and proposed residential development, the following master planned communities may be impacted: <ul style="list-style-type: none"> - Ocotillo Verde - Caballero - Magma Ranches II - Magma Ranches - Sky View Farms - Sun Valley Farms - Arizona Farms - Dobson Farms
<p>Southern Connection Alternative 2: North-South corridor from Arizona Magma Railroad near Judd Road to connection with SR-287 near Valley Farms Road.</p>	<ul style="list-style-type: none"> • Connection to SR-287 near Valley Farms Road positions the corridor for more direct access to a future extension of corridor to Coolidge airport. • However, future definitions could be identified to provide access to the airport if the corridor is connected to SR-79. • Enables collocation of the North-South corridor with the approved route of the 500 kV line. • City of Coolidge is preparing a General Plan Amendment that will enable preservation of a corridor for a future transportation facility on Clemens Road. A connection to SR-287 is more consistent with these plans than is a connection to SR-79. In addition, Westcor has purchased a large parcel of property near the Clemens Road alignment. A connection to SR-287 may improve access to and from the mall. • An additional crossing the Gila River is important for future mobility and accessibility within the study area. 	<ul style="list-style-type: none"> • Connection to SR-79 disconnects the North-South corridor from 'straight-line' path connectivity to Clemens Road alignment, which is envisioned by City of Coolidge to become a major transportation facility. • Corridor alignment would likely impact the following existing and proposed master planned communities: <ul style="list-style-type: none"> - Dobson Farms - Arizona Farms - Anthem - Merrill Ranch - Wild Horse Estates - Mesquite Groves - Oasis at Magic Ranch - Sonoran Village • Collocation of the North-South corridor with the 500 kV line creates a large 'foot-print' area that may require a very wide right-of-way to accommodate utilities, the CAP, and the railroad.

4. CORRIDOR DEFINITION

The needs assessment phase of the study identified the North-South corridor which connects SR 202L via the Williams Gateway corridor to the Florence/Coolidge area. This section presents the preliminary recommended North-South corridor definition considering engineering, environmental, jurisdiction, and public perspectives opportunities and constraints.

4.1 Description of Preliminary North-South Corridor Definition

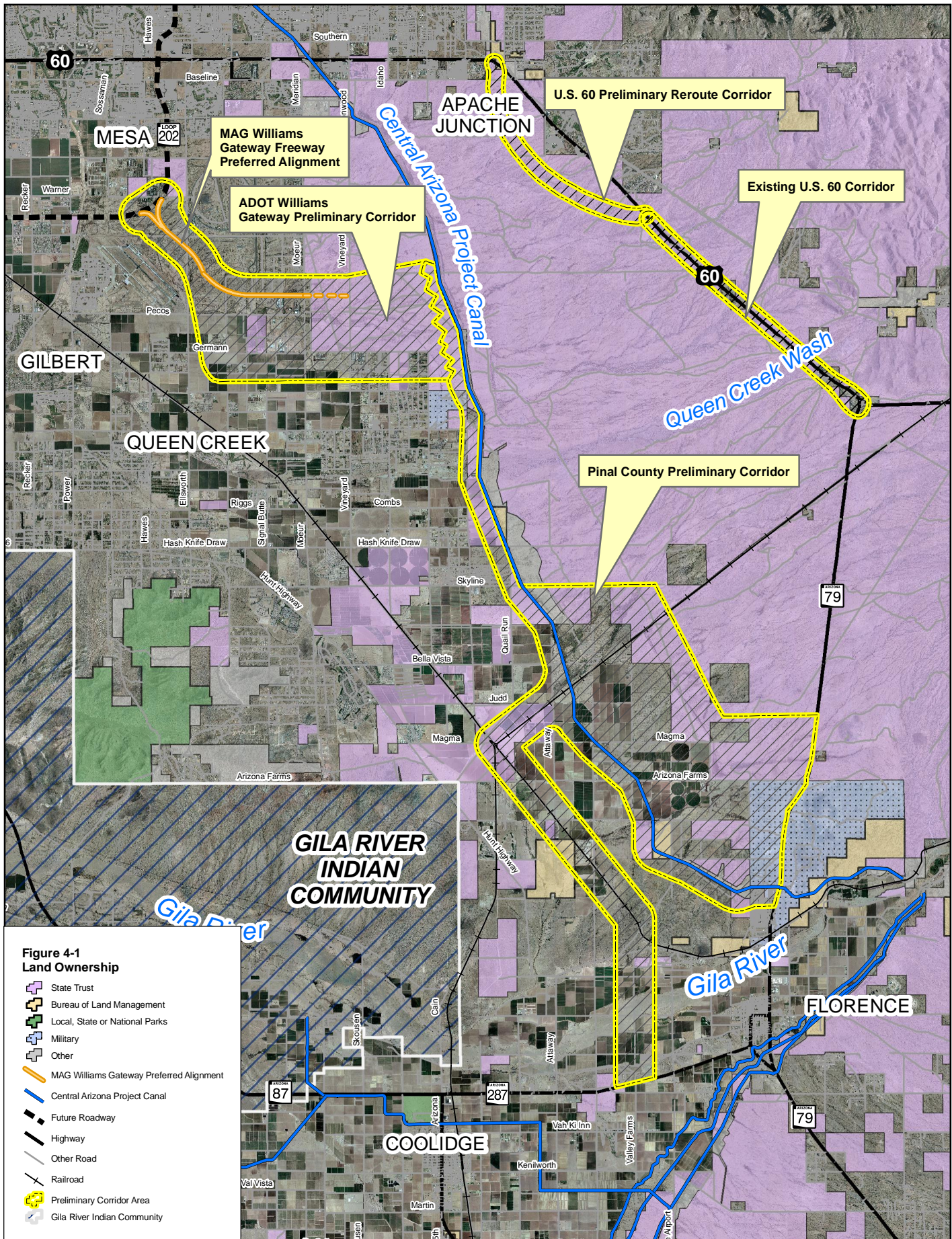
As a final alignment has not been selected for the MAG Williams Gateway corridor, the definition is flexible enough to accommodate whichever alignment is ultimately selected by ADOT and MAG for the Williams Gateway freeway.

The North-South corridor definition begins at a future intersection with the Williams Gateway corridor at the CAP. The corridor definition proceeds in a south-southeasterly direction along the CAP until the intersection with the Magma Arizona Railroad. The definition in this area is narrowly focused, approximately ¼ mile wide, and lies directly adjacent to the 1000 feet corridor that has been identified for the SRP 500 kV line.













As the definition reaches the Arizona Magma railroad, it broadens and becomes less specific. A future corridor alignment could be identified within this definition that extends to SR-79 or alternatively to SR-287. A connection to SR-79 would be less impactful to future master planned communities, but may provide less relief and benefit to future north-south arterials within the Florence area. In addition, this definition would not provide an additional, and much needed, crossing of the Gila River. A corridor connection to SR-79 could be located near the Magma Flood Retarding Structure. This land is currently undeveloped, and is mostly within the jurisdiction of the Arizona State Land Department.

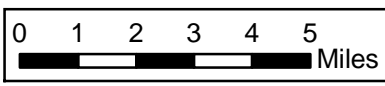
The recent approval of the SRP 500 kV transmission line alignment provides an opportunity to connect the North-South corridor to SR-287, generally following the same alignment as the 500 kV transmission line. This corridor definition passes through several proposed master planned communities, but provides additional advantage to a connection to SR-79. Namely, this definition enables the collocation of a transportation corridor into a consolidated corridor that impacts less land overall than would separate transmission line and transportation corridors. In addition, a connection to SR-287 better positions the corridor for future continuation south of SR-287. A connection to SR-287 is more centrally located within the study area and thus may provide more relief to future arterials. Finally, a connection to SR-287 provides an additional crossing of the Gila River.

An outline of the preliminary corridor definition is superimposed upon land ownership, master planned communities, drainage, environmental information in **Figures 4-1** through **4-4**.



**Figure 4-1
Land Ownership**

-  State Trust
-  Bureau of Land Management
-  Local, State or National Parks
-  Military
-  Other
-  MAG Williams Gateway Preferred Alignment
-  Central Arizona Project Canal
-  Future Roadway
-  Highway
-  Other Road
-  Railroad
-  Preliminary Corridor Area
-  Gila River Indian Community



Data Source:
Arizona Land Resource Information System



Kimley-Horn
and Associates, Inc.



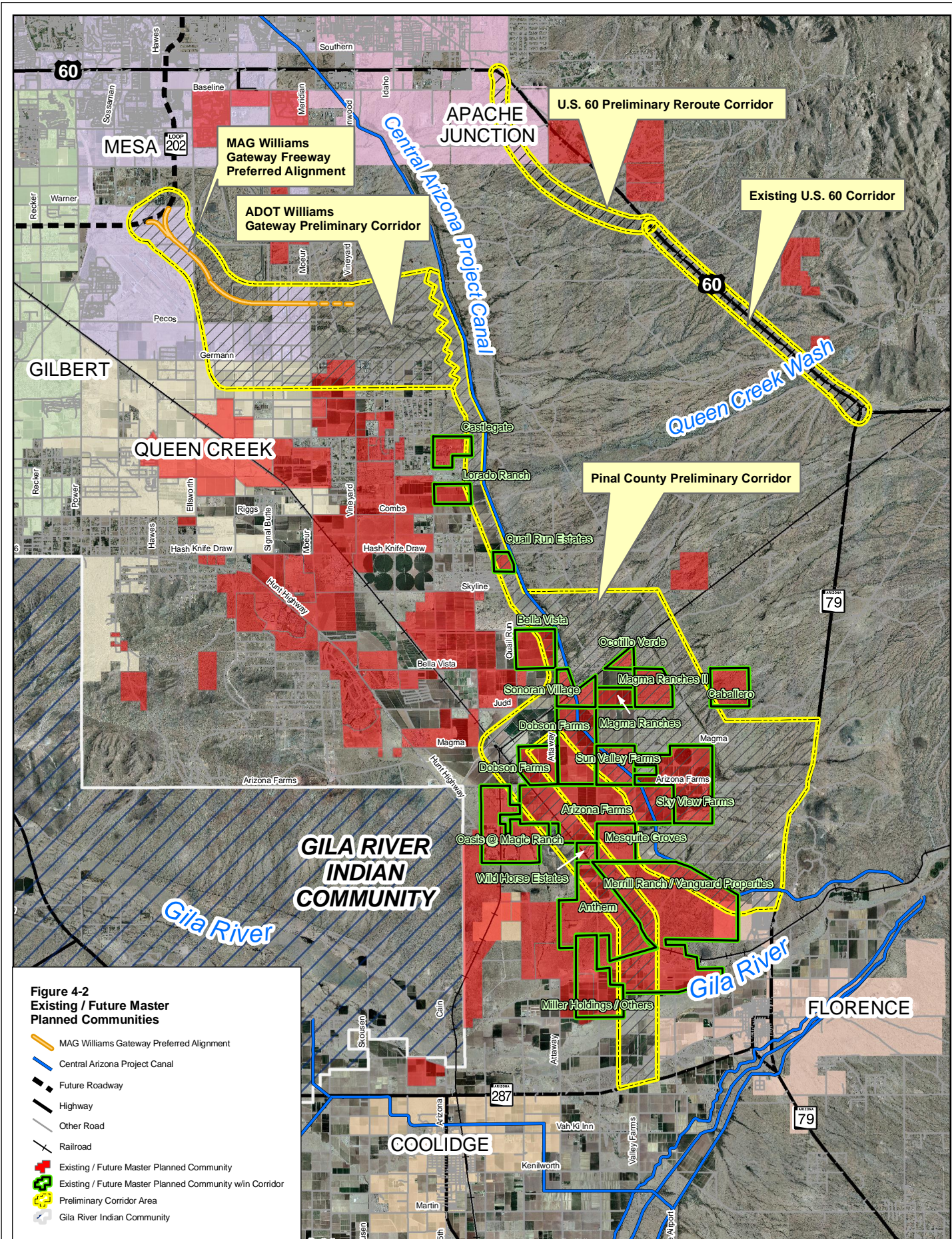


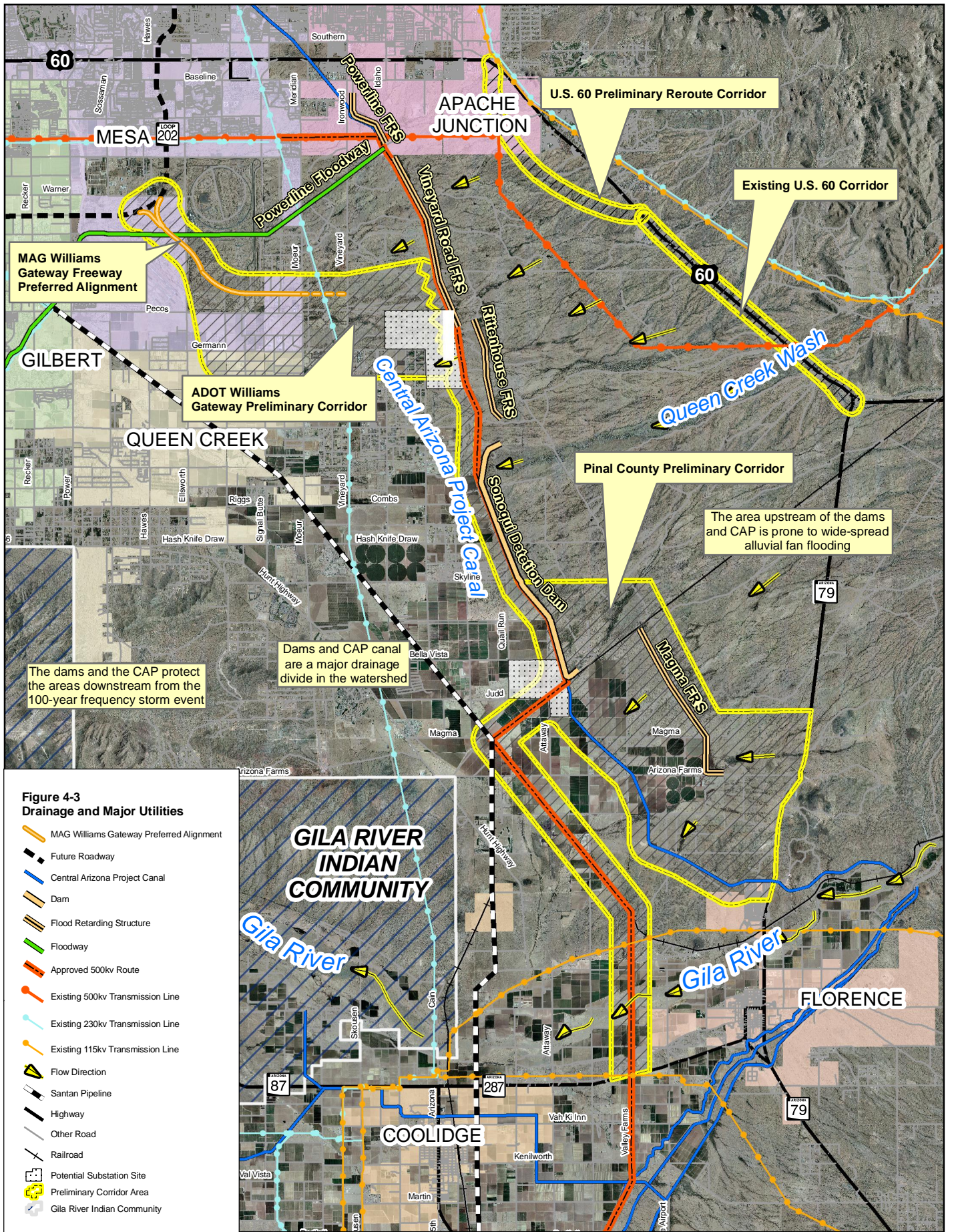
Figure 4-2
Existing / Future Master
Planned Communities

- MAG Williams Gateway Preferred Alignment
- Central Arizona Project Canal
- Future Roadway
- Highway
- Other Road
- Railroad
- Existing / Future Master Planned Community
- Existing / Future Master Planned Community w/in Corridor
- Preliminary Corridor Area
- Gila River Indian Community

N

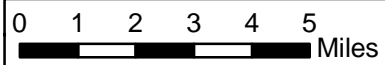
0 1 2 3 4 5 Miles

Data Source:
Pinal County, Town of Florence,
Commerce Realty Advisors Ltd.,
Arizona Land Resource Information System



**Figure 4-3
Drainage and Major Utilities**

- MAG Williams Gateway Preferred Alignment
- Future Roadway
- Central Arizona Project Canal
- Dam
- Flood Retarding Structure
- Floodway
- Approved 500kv Route
- Existing 500kv Transmission Line
- Existing 230kv Transmission Line
- Existing 115kv Transmission Line
- Flow Direction
- Santan Pipeline
- Highway
- Other Road
- Railroad
- Potential Substation Site
- Preliminary Corridor Area
- Gila River Indian Community

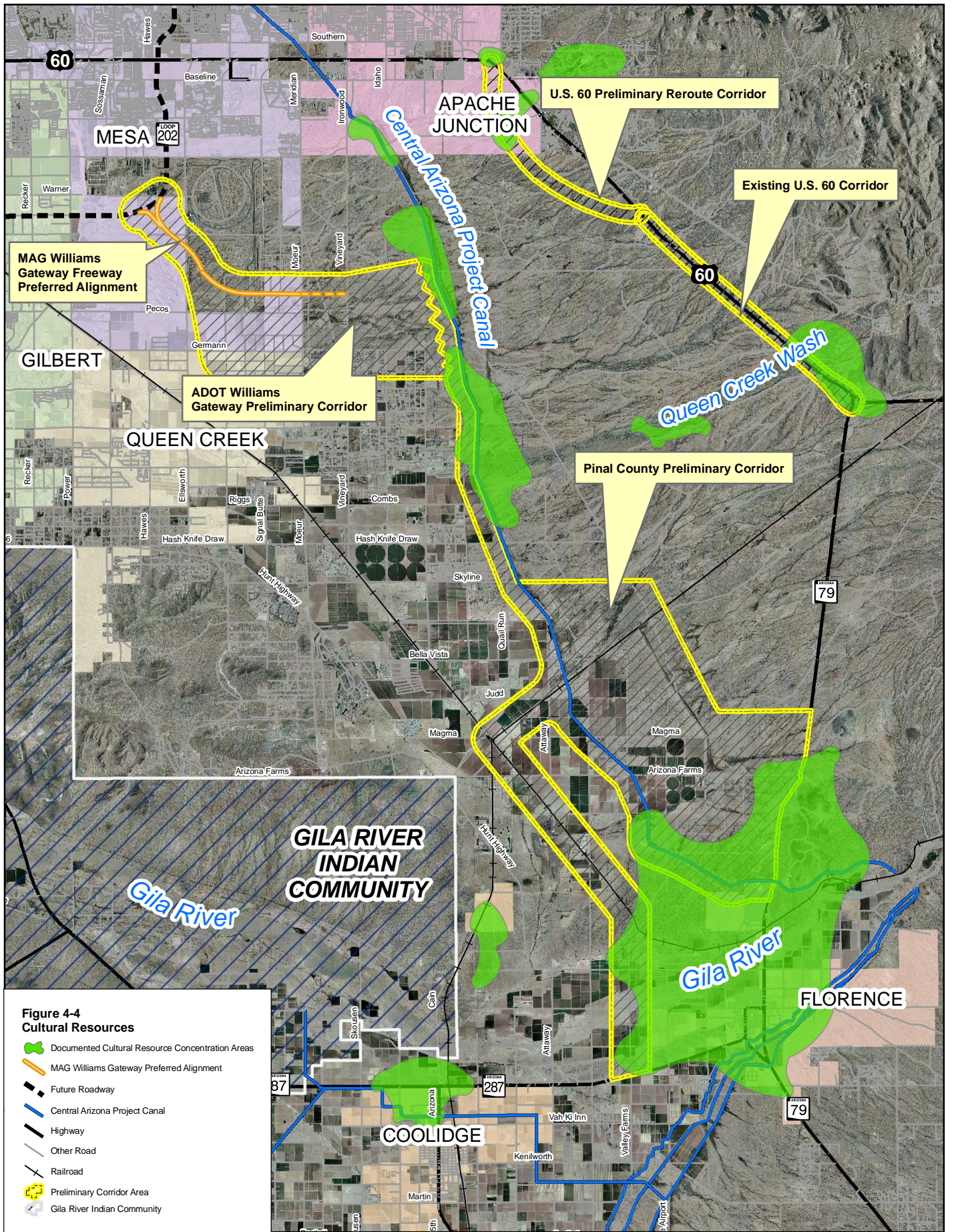


Data Source:
Arizona Land Resource Information System,
Salt River Project



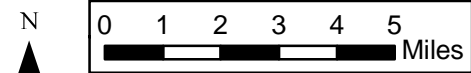
Kimley-Horn
and Associates, Inc.





**Figure 4-4
Cultural Resources**

- Documented Cultural Resource Concentration Areas
- MAG Williams Gateway Preferred Alignment
- - - Future Roadway
- Central Arizona Project Canal
- Highway
- Other Road
- Railroad
- Preliminary Corridor Area
- Gila River Indian Community



Data Source:
Arizona Geological Survey, Arizona
Land Resource Information System



Kimley-Horn
and Associates, Inc.



4.2 Estimate of Probable Cost

Corridor planning-level cost estimates have been developed. Cost estimates reflect the total highway development including the costs of planning and engineering studies, design, roadway construction, and right-of-way acquisition. The cost estimates provide an approximation that is suitable for use in programming the next steps of highway development.

4.2.1 Planning, Engineering, and Construction Costs

Planning and engineering cost are based on per mile unit costs for constructing limited access roadway sections. The per mile construction costs include provisions for typical drainage improvements, structures, environmental mitigation, and other related infrastructure.

A recent report, *Performance Audit of Arizona Department of Transportation: Review of the Oversight and Management of the Maricopa County Regional Freeway System, June 2005*, provides average construction cost averages for freeway construction in the Phoenix Metropolitan area. The report states that capital construction costs for a selected number of segments in the MAG Regional Freeway System varied between \$2.38 and \$3.78 million per lane mile. For a 6-lane freeway, this is approximately \$14 to \$22 million per centerline mile. This figure does not include right-of-way, design, and landscaping costs. The audit report states that these costs are comparable with the construction cost standards adopted by the California Department of Transportation (CalTrans), where the actual costs per lane mile should be within the \$5 million range.

In April of 2004 the Maricopa Association of Governments reported that the total cost per Regional Freeway System centerline mile was \$39 million. This figure represents all costs associated with the design, property acquisition, utilities, landscape and construction of the freeway. Input received from ADOT staff indicates that future costs will be higher due to rising construction and right-of-way costs. ADOT staff has suggested that recent projects indicate that costs in the near future will be closer to \$42 million per centerline mile due to increased land prices and escalating construction costs.

The MAG Williams Gateway Corridor, as estimated by the *MAG Williams Gateway Corridor Alignment Study, July 2005*, is projected to cost between \$243 million to \$333 million. This study does not provide a detailed break-down in costs, but this corridor would equate to an estimated unit cost of \$54 million per mile for this 4.5 mile corridor. The study states that this estimated cost is within the amount allocated by the MAG Regional Transportation Plan, implying that this estimate includes total development costs including design, drainage facilities, system and service interchanges and right-of-way.

Estimates or probable cost developed by Kimley-Horn and Associates for other projects cite a unit construction cost of \$8.0 - \$10 million for a 6-lane freeway. This does not include engineering and other pre-design activities, right-of-way acquisition, and other associated costs.

Based upon the various information sources cited above, an estimate of probable cost for a 6-lane North-South corridor extending from approximately the Frye Road alignment to either SR-79 or SR-287 is presented in **Table 4-1**. The estimate of probable cost assumes that the corridor would range from approximately 17 miles to 21 miles in length, depending upon the final alignment that is selected. A corridor that connects to SR-79 could range from 17 to 19 ½ miles in length, while a corridor connecting to SR-287 could be

approximately 22 miles in length. The estimate assumes that the corridor would include 1 system interchange and 6 service interchanges at a spacing of approximately 2 miles.

Table 4-1 – Estimate of Probable Cost by Source

Item	Units	Number of Units	Estimated Unit Probable Cost	Total Estimated Probable Cost
6-Lane Freeway Facility	Miles	17	\$10 million	\$170 million
		22		\$220 million
System Interchange	Each	1	\$50 - \$150 million	\$75 - \$150 million
Service Interchange	Each	6	\$15 million	\$90 million
Roadway Subtotal				\$335 - \$460 million
Construction Contingency	20% of Roadway Construction Cost			\$67 - \$92 million
Construction Administration	15% of Roadway Construction Cost			\$50 - \$69 million
Construction Total				\$452 - \$621 million
Pre-Design Studies	5% of Construction Total Cost			\$23 - \$31 million
Design Costs	10% of Construction Total Cost			\$45 - \$62 million
Total North-South Corridor Cost (excluding right-of-way)				\$520 - \$714 million
Total North-South Corridor Cost per mile (excluding right-of-way)				\$30 - 32 million

4.2.2 Right-of-Way Acquisition Costs

As land continues to appreciate each year within the study area, right-of-way costs will inevitably increase. It is not an unreasonable assumption that right-of-way costs could exceed construction costs. While the majority of land within the corridor definition study area is currently undeveloped, plans for developing large tracts for master planned communities within the study area are well underway. Some are currently under construction. As such, right-of-way costs for future corridors are nearly impossible to estimate with any degree of certainty. Furthermore, much of the land being considered for the corridor definition is within the jurisdiction of Arizona State Land Department which typically auctions land to the highest bidder.

Recent data available from the Arizona State Land Department indicate that the average sales price per auctioned acre of land was \$187,200 in 2004. (In 2004 the Land Department held 20 auctions across the State and sold about 1800 acres of State Trust Land for \$337 Million) In areas of strong development pressure the average sales price has been significantly exceeded. As an example, on July 13, 2005, \$92.2 Million were paid for 288 acres of Arizona State Trust Land in the Desert Ridge Master Planned Community. This amounts to more than \$320,000 an acre. Future corridor development may be challenged by the potentially high cost for right-of-way acquisition on State Trust Land.

Information provided by stakeholder committee members indicated that land within the study area is currently selling for approximately \$45,000 per acre. Assuming that the corridor definition will require 300 feet of right-of-way, an estimate of probable cost for

required right-of-way is presented in **Table 4-2**. This estimate does not include right-of-way required for system and service interchanges.

Table 4-2 – Potential right-of-way costs (in 2004 land values)

Corridor Length	Right-of-way	Total Acres	Unit Cost / Acre	Total Right-of-Way Cost
17 miles	300 feet	618 acres	\$45,000	\$27.8 million
			\$187,200	\$115.7 million
22 miles	300 feet	800 acres	\$45,000	\$36 million
			\$187,200	\$149.8 million
Potential right-of-way cost per mile				\$1.6 – \$6.8 million

5. CORRIDOR DEVELOPMENT

This section discusses the steps and activities that will be required to develop the recommended corridors.

5.1 Steps Required for Pinal Corridors Development

While not explicitly spelled out in state statutes or ADOT policy, State Route designation by the State Transportation Board has historically made the route eligible for ADOT planning studies to develop, evaluate, and refine corridor alternatives and to resolve other planning issues to justify State Highway designation. Once designated as a State Highway, highway development is the responsibility of the ADOT Roadway Engineering Group. Highway development by the ADOT Roadway Engineering Group is carried out in accordance with the ADOT Policy and Implementation Memorandum 89-5 which contains procedures for scoping studies, feasibility studies, location and design concept studies, and environmental studies. These studies are requisites to the development of construction documents including plans, specifications, and cost estimates.

Based on a review of ADOT policies and procedures for highway development, development of the Pinal County Corridors recommended in the Corridor Definition Studies will require that the following reports and activities be performed.

- Feasibility Report – The purpose of the feasibility report is to document project purpose and need, geometric issues, terrain issues, drainage issues, environmental issues, public and agency concerns which need to be addressed in a location/design concept report. A typical feasibility report requires data collection, agency coordination, public involvement, roadway alternatives development and evaluation, and an environmental overview.
- Location/Design Concept Report and Environmental Clearance – The purpose of the location/design concept report is to address the issues and refine alternatives documented in the feasibility report and to evaluate roadway design concept alternatives. A typical design concept report requires preparation of engineering reports (such as geotechnical, traffic, drainage, structures, and AASHTO controlling design reports), the development of preliminary design plans, implementation plans, and cost estimates. Concurrent with the preparation of the location/design concept report, environmental clearance documents are required if Federal funds are to be used in highway construction. A typical environmental clearance document requires preparation of environmental reports (such as biological, cultural resources, air quality, noise, hazardous materials, and visual impact reports), and public involvement.
- Construction Plans, Specifications, and Cost Estimates—ADOT construction document preparation procedures advance the design concepts documented in the location/design concept report to construction documents which are requisite to acquisition of public rights-of-way required for roadway construction.
- Right-of-way Acquisition
- Construction

5.2 Funding Options

As illustrated by the estimates of probable cost presented in **Table 4-1** and **Table 4-2**, development costs for the North-South corridor are considerable. The cost to develop and construct the corridor may approach \$ 1 billion dollars. This section describes potential funding and financing options that have potential to be used on this project. Information on funding

sources was obtained from the *Pinal County Annual Budget (2004-2005)*, *ADOT 5-Year Transportation Facilities Construction Program Fiscal Years 2006-2010*, *2002 Arizona Transportation Factbook*, the ADOT Local Government Section, and ADOT Financial Management Section. Funding Sources are subcategorized by state, federal, local, and other sources.

5.2.1 State Funding Sources

This section addresses State of Arizona funding sources.

- **The Highway Users Revenue Fund (HURF)** – Under provisions of Arizona Revised Statutes Title 28, Sections 6538 and 6540 and State Transportation Policy, Pinal County receives a portion of state revenues generated from motor fuel taxes and vehicle registration fees for the construction of controlled access freeways in the county. This is the primary source of funding for the Pinal County Public Works Department. The 2004 HURF fund distribution to Pinal County was \$11,515,102¹⁰.
- **Local Transportation Assistance Fund** – These funds are proceeds from the Arizona state lottery and are distributed to incorporated cities, towns, and counties on the basis of population. The funds can be used for public transportation and transportation purposes depending on the jurisdiction's population.

5.2.2 Federal Funding Sources

This section discusses federal funding sources.

- **National Highway System** – The National Highway System includes the Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility. The National Highway System was developed by the US Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations. National Highway System funds can be used for construction, resurfacing, restoration and rehabilitation, and safety improvements of the National Highway System.
- **Surface Transportation Funds (STP Funds)** – These funds are state flexibility funds for construction, reconstruction, rehabilitation, resurfacing, restoration and operational improvements. The local government roadway must meet the federal functional classification requirements and be included in the approved list of routes for the MPO or COG. Each MPO and COG has a list of approved roadways that are eligible for federal funds participation. STP projects are funded at 94.3% federal share and 5.7% local share. The current *ADOT Five Year Transportation Facilities Construction Program* lists four projects in Pinal County using STP funding, including two projects on US 60 and projects on SR 287 and SR 347.
- **Congestion Mitigation and Air Quality Improvement Program (CM Funds)** - The Congestion Management System (CMS) is a federal requirement that is used in developing a Transportation Improvement Program (TIP). The CMS includes a qualitative policy element and a quantitative rating system for projects. The quantitative rating system includes factors related to congestion, multimodal evaluation, land use considerations and cost effectiveness. Transportation projects that are included as part of an approved State Implementation Plan (SIP) or Nonattainment or Maintenance Area Plan must be given the highest priority for CMAQ funding. CMAQ projects are funded

¹⁰ *ADOT Highway User Revenue Fund Fiscal Year 2004 Year End Report*

at 94.3% federal share and 5.7% local share. Only a portion of the study area is within a non-attainment area. As such, CMAQ funds may not be available for development of the North-South corridor.

- **Replacement and Rehabilitation Program (BR Funds)** – These funds are for the replacement of structurally deficient or functionally obsolete highway bridges or to rehabilitate the structural integrity of a bridge. Any bridge in the State that is included in the Statewide Inventory of Bridges maintained by ADOT and is inspected on a regular interval either by ADOT or the local jurisdiction, and has a sufficiency rating below 50, is eligible for Bridge Replacement funds. Bridges with a sufficiency rating above 50 qualify for Bridge Rehabilitation funds. Bridges with a sufficiency rating above 50 which are considered for replacement may be considered if the life-cycle analysis documents that it is more cost-effective to replace the bridge rather than rehabilitate it. Cost analysis for these bridges must be submitted to ADOT's Local Government Engineer for approval. All projects should be selected in accordance with requirements described in ADOT's Bridge Management Program. BR projects are funded at 80% federal share, 20% local share.
- **Hazard Elimination System (HES)** -This funding is for high accident location safety improvement projects in conformance with the Federal-Aid Hazard Elimination System (HES) and ADOT's Action Plan. Projects under this program are developed in a similar manner as other Federal-Aid highway projects. However, proposed projects will not be approved for Federal-Aid funding until they are evaluated by ADOT and the Federal Highway Administration (FHWA) and found to meet eligibility criteria.
- **Railroad/ Highway Grade Crossing** - This federal program is available to improve highway safety at qualified public rail-highway grade crossing locations and is administered by the Arizona Department of Transportation (ADOT)'s Utility & Railroad Engineering Section (URES). Projects are 100% funded by the Federal Highway Administration.
- **Transportation Enhancement Funds (TEA Funds)** - Provides funding for facilities such as pedestrian walkways and bicycle paths, acquisition of scenic easements, restoration of scenic or historic sites.

5.2.3 Local Funding Sources

This section discusses potential local funding sources.

- **Bonds** - Issuing county bonds is a potential source of funding for transportation improvements. However, Pinal County's authority to issue bonds and the amounts and purposes for which bond funds can be used are limited by Arizona State Law and the County's internal financial policies.
- **Pinal County Sales Tax** - according to the *Pinal County Annual Budget for 2004-2005*, County sales tax and state shared sales tax account for a large percentage of county revenues, and are subject to wide fluctuations based on economic conditions. Because of the variability of the sales tax revenues, the text of the *Annual Budget* states that it is good for smaller one-time capital purchases rather than major long-term or time sensitive purchases. However, this is an option that could be further explored.

5.2.4 Other Funding Sources

- **Toll Roads**- Stakeholders have mentioned that development of the corridors as toll facilities could be considered. Toll roads will be discussed in more detail in the Final Report.

- **Cost sharing with Developers, Private Contributions, or other municipalities-** Based on agreements between Pinal County and public or private entities, cost sharing for the construction of road improvements is a form of financing that has been used by Pinal County on a number of projects. The Pinal County Five-Year Transportation Plan lists a number of road improvements where the cost was shared with builders, developers, or other jurisdictions. As an example, Pinal County has encouraged developers to contribute \$1,100 per home to the Superstition Valley Transportation Fund, the funds of which are paying for improvements to major arterials such as to Ironwood Road. Pinal County is currently considering an impact fee program.
- **State Land Dedication** – Much of the land within the corridor definition is currently Arizona State Trust Land. Stakeholders have suggested that agreements could be developed in which right-of-way is dedicated by developers as part of an auction and purchase requirement. Alternatively, the Arizona State Land Department has indicated, as part of other unrelated development projects, that it may be possible to dedicate right-of-way if it can be demonstrated that dedication would increase the value of adjacent land such that it would cover the cost of the right-of-way.

5.2.5 Financing Options

This section discusses corridor financing options.

- **HURF Bonds** - The State Transportation Board issues Highway User Revenue Bonds to accelerate the construction of highway construction programs throughout Arizona. The pledged revenues are the HURF funds deposited in the State Highway Fund.
- **Highway Expansion and Extension Loan Program (HELP)** - Authorized by Congress in 1995, State Infrastructure Banks (SIB) operate much like private banks by providing financial assistance in the form of loans or credit enhancement for transportation projects. Arizona's SIB, the HELP fund, was established in 1998. In 1999, Senate Bill 1201 set total HELP funding at approximately \$370 million. STB is also authorized to provide loans from the HELP fund. Since 2000, the Accelerated Program has averaged approximately \$44 million a year in HELP loan funding.
- **Grant Anticipation Notes (GANs)** - The State Transportation Board also has the authority to issue GANs which are notes backed by a pledge of future federal funds. This allows the state to use federal funds earlier and in advance of when they are actually earned, and thus allowing the state to start projects sooner. This practice of spending money not yet earned through the use of the GANs is both permissible and encouraged by Federal Highway Administration. Local Communities participate in paying the cost of interest on the notes.
- **Board Funding Obligations (BFOs)** - The State Transportation Board has the authority to issue non-negotiable Board Funding Obligations for purchase by the Arizona State Treasurer. In addition to capitalizing Arizona's State Bank (used for funding HELP Loans), the Board can issue BFO's for the State Highway Fund.
- **Transportation Infrastructure and Innovation Act (TIFIA)** - This new federal program consists of three types of financial assistance, including secure loans, loan guarantees, and standby lines of credit. Under TEA-21, the projects must qualify under Title 23.

5.3 Review of Arizona Statutes, ADOT Policies, and System Criteria for State Highway System Designation

A stated objective of the Pinal County Corridor Definition Study is to provide recommendations for jurisdictional responsibilities for recommended corridors. This section presents criteria for

evaluating routes that may qualify for inclusion on the state highway system. It discusses relevant state statutes, as well as State Transportation Board (Board) policies.

5.3.1 Arizona Revised Statutes

This section presents a review of Arizona Revised Statutes as they pertain to the designation of state highways.

5.3.1.1 State Highway and State Route Definition

Definitions for state highways and state routes are provided in ARS 28-101, Definitions, and ARS 28-7041, State Highways and Routes Defined. In particular, ARS 28-7041 is a key legislative statute to reference for this analysis. It is provided in its entirety as follows (bold and italics were added to highlight areas that refer to the process for designating a state highway and the requirements for a state highway). Key elements of Statute 28-7041 include the requirement that a road must be recommended to the Board by the Director of Transportation to be designated a state highway, and (in item B) a state highway must first be designated as a state route.

These statutes are provided as follows:

28-101. Definitions

49. "State highway" means a state route or portion of a state route that is accepted and designated by the board as a state highway and that is maintained by the state.

50. "State route" means a right-of-way whether actually used as a highway or not that is designated by the board as a location for the construction of a state highway.

28-7041. State highways and routes defined

A. The state highways, to be known as state routes, consist of the highways declared before August 12, 1927 to be state highways, under authority of law, ***that the board, after receipt of a recommendation from the director, may add to, abandon or change.*** If the board proceeds contrary to the recommendations of the director, it shall file a written report with the governor stating the reasons for the action.

B. The state highways consist of the parts of the state routes designated and accepted as state highways by the board. A highway that has not been designated as a state route shall not become a state highway and any portion of a state route shall not become a state highway until it has been specifically designated and accepted by the board as a state highway and ordered to be constructed and improved.

C. All highways, roads or streets that have been constructed, laid out, opened, established or maintained for ten years or more by the state or an agency or political subdivision of the state before January 1, 1960 and that have been used continuously by the public as thoroughfares for free travel and passage for ten years or more are declared public highways, regardless of an error, defect or omission in the proceeding or failure to act to establish those highways, roads or streets or in recording the proceedings.

5.3.1.2 Responsibility of the State Transportation Board to Designate a State Highway

Statute 28-304 section B defines the powers and duties of the State Transportation Board regarding establishing a state highway system. A partial excerpt of this statute is provided as follows:

28-304. Powers and duties of the board; transportation facilities

B. With respect to highways, the board shall:

1. ***Establish a complete system of state highway routes.***
2. ***Determine which state highway routes or portions of the routes are accepted into the state highway system*** and which state highway routes to improve.
3. ***Establish***, open, relocate or alter a portion of a state route or ***state highway***.
4. Vacate or abandon a portion of a state route or state highway as prescribed in section 28-7209.
5. Sell board funding obligations to the state treasurer as provided in section 28-7678.

5.3.1.3 Process of Designating a State Highway

The process of transferring a state route to a state highway is further defined in Statute 28-7043. Statute 28-7043 provides for noticing requirements for the affected county to participate in the State Transportation Board meeting and have their opinion heard regarding the designation of state route to a state highway. The statute also states that a state route should not be designated as a state highway until monies for its improvement are provided in the budget of the department.

28-7043. Designation of state route as state highway

A. At least two weeks before the designation and acceptance by the transportation board of a state route or portion of a state route as a state highway, the transportation board shall give notice to the board of supervisors of the county in which the proposed highway is located of the intention of the transportation board to consider the designation.

B. The board of supervisors may:

1. Appear before the transportation board and be heard on the proposal.
 2. ***Petition the transportation board to take over and designate a state route as a state highway.***
- C. ***Until designated and accepted as state highways, all state routes are county highways*** and shall be constructed, improved and maintained as county highways, except as otherwise provided in this title.
- D. ***A part of a state route shall not be taken over or designated as a state highway until monies for its improvement are provided in the budget of the department. If part of a state route is designated and accepted by the transportation board as a state highway, the department shall maintain the highway.***

ARS 28-7046 states that the Director must deliver a written report to the State Transportation Board to establish a state highway, and that the Superior Court may review the action of the State Transportation Board.

28-7046. Opening, altering or vacating highway; review of order

A. If the director or the board desires to *establish*, open, relocate, alter, vacate or abandon a state highway or a portion of *a state highway, the director shall make and deliver a written report to the board describing the highway or portion of the highway to be affected*. If the board decides that the public convenience will be served, it shall enter a resolution on its minutes approving the proposed action and authorizing the director to proceed and to acquire any property for the action by condemnation or otherwise.

B. The *superior court may review by certiorari the action of the board* establishing, opening, relocating, altering, vacating or abandoning state highways.

ARS 28-7049 defines the criteria of connectivity for state highways that involves forming necessary or convenient links to connect sections of state highways or state routes, or for carrying state highways through cities and towns.

28-7049. Classification of streets that connect highways and routes

A. *If the streets of an incorporated city or town form necessary or convenient links for the connection of sections of state highways or state routes, or for carrying the state highways or state routes through the city or town, the director and the governing body of the city or town, in the case of state highways, or the board of supervisors and the governing body of the city or town, in the case of state routes, may agree that the streets are deemed state highways or county highways, respectively.*

B. *The agreement shall provide for maintenance of the streets classified* pursuant to this section.

5.3.2 State Transportation Board Policies

The State Transportation Board has broad authority to plan and develop Arizona's highways, airports, and other state transportation facilities. In addition to these general policy responsibilities the Board is responsible for development and oversight of the State's Five-Year Transportation Facilities Construction Program and for policy and rule-making in the following areas:

- Priority Programs
- Establishing, altering or vacating highways
- Construction contracts
- Accelerated funding mechanisms
- Local government airport grants
- Designating or establishing scenic or historic highways

State Transportation Board Policies 5 and 16 serve as criteria for establishing state highways. Key phrases in the policies that serve as criteria are highlighted and bolded. Policy 5 highlights the need for state highways to provide connectivity between population centers and to interconnect with those of other states. Policy 16 highlights the need to provide a statewide network to serve the movement of goods and people.

Policy No. 5 -State Highway System Priorities Policy

1. It is the policy of the Board to implement Arizona's vision for an integrated statewide transportation system by placing priority on state highways that:
 - *Connect Arizona's regions and population centers by an efficient network of highways to carry travelers and commerce throughout the state;*
 - Connect Arizona, its regions and population centers with other states and Mexico; and
 - *Connect major population centers and through routes within urban areas with high volume routes that increase mobility of people and goods.*
2. Consistent with these priorities, the State Highway System should include *routes primarily designed to carry through traffic*, including:
 - Interstate Highways;
 - *Other arterial routes connecting Arizona's population centers and interconnecting with those of other states; and*
 - *High capacity connecting routes needed to form an efficient network.*

Policy No.16 - Transfer of State Routes Policy

16.1. states that "It is the policy of the Board that **the State Highway System consist primarily of routes necessary to provide a statewide network to serve the ever changing environment with regards to statewide and regional movement of people and goods.** Routes primarily providing land access and local movement of people and goods should be the responsibility of local governments. The Transportation Board will seek to transfer these routes to other jurisdictions."

5.3.3 *State Highway Criteria from ADOT Route Transfer and Level of Development Study*

Another source of criteria for state highways is the *Route Transfer and Level of Development Study*, (2004) prepared by HDR and Kimley-Horn for the Arizona Department of Transportation. As part of this study, criteria for inclusion of a road on the state highway system were developed for functional categories of state highways. These criteria are summarized in **Table 5-1**.

Table 5-1 – State Highway Criteria from Route Transfer and Level of Development Study

Facility	Definition	Classification Criteria
Freeways	Interstate and urban controlled access facilities designed for high volume, high speed and full access control.	<ul style="list-style-type: none"> ▪ Designated as Interstate Highway or Urban freeway
Other Major Facilities	Other major facilities serving significant auto or truck traffic forming a network of high capacity routes for long-distance travel. In rural areas they are designed for high speeds and continuous flow. In urban areas they are designed and maintained for continuous flow with minimal interruptions. Where volumes exceed 5,000 average daily traffic (ADT), designs are often multi-lanes with expressway characteristics	<ul style="list-style-type: none"> ▪ Rural routes with more than 5,000 ADT ▪ Connecting rural National Highway System (NHS) routes with more than 1,500 ADT ▪ Key freight routes (more than 1,000 articulated trucks per day) ▪ Urban and rural connecting routes to form a network in which Other Major Facilities routes connect at both ends to Freeways or other Major Facilities routes
Other Statewide Routes	Other statewide routes providing for long distance travel and regional links through urban areas. These roads contain the majority of miles on the highway system, filling the network to provide access to all areas of the state. In rural areas they are generally higher speed routes, although with more variation in speed than would be acceptable on the “other major facilities” category. In larger urban and suburban areas they are designed for continuous flow, but with more interruptions than being acceptable for the “other major facilities” category.	<ul style="list-style-type: none"> ▪ Rural arterial and major collector routes with more than 1,500 ADT ▪ Urban arterial routes with more than 5,000 ADT ▪ Connecting routes necessary to form a network in which all other statewide routes connect with Freeways, Other major facilities or other statewide routes ▪ Not including business routes and other routes with parallel state highways of higher classification
Non-statewide routes serving points of state and National interest	Lower volume rural routes connecting facilities or regions of statewide significance. These routes are expected to stay on the state system because they serve significant state or national facilities, including national parks and monuments and institutions such as prisons and major research centers. However they do not handle significant volumes of through traffic and are not a significant part of the state system.	<ul style="list-style-type: none"> ▪ Routes that would normally be classified as a route without statewide significance but serves a state or national facility ▪ Provide only access to a large population or land area.

5.3.4 Summary of Criteria for a State Highway Designation

Based on the policies defined in the previous sections, a list of criteria was developed to determine if the North-South Corridor could meet the criteria to be defined as state highways. These criteria can be answered by the questions posed in **Table 5-2**.

Table 5-2 – North-South Corridor Criteria Satisfaction for Designation as State Highway

Criteria for Designation as State Highways	Degree to which North-South corridor Meets Criteria
1. Has this road been designated as a state route? If yes, what are the specifics of the route designation? (Per ARS 28-101, 28-7041)	No, the corridor has not been designated as a state route.
2. Does this road form a convenient or necessary link for connecting sections of state highways or for carrying state highways or state routes through cities or towns? (Per ARS 28-7049).	Yes. The North-South corridor would connect SR-287 (a state highway) or SR-79 (a state highway) to Williams Gateway Corridor and Loop 202 through the towns of Florence, and unincorporated Pinal County. The North-South corridor would relieve a significant amount of through traffic currently traveling through the Town of Queen Creek. Other north-south links between SR-79 and Loop 202 are not planned to be access controlled.
3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5).	Yes, as it is being proposed, the corridor would be a 6-lane access controlled facility. Future traffic volumes vary between 30,000 and 140,000 vehicles per day, indicating that the route will serve both through trips and local trips.
4. Does this route connect Arizona's population centers? (State Transportation Board Policy No. 5)	Yes, the North-South corridor would connect emerging population centers in Florence and Coolidge to employment centers in Williams Gateway area and to the Phoenix metropolitan area.
5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)	No, the North-South corridor will not interconnect with state highways of other states.
6. Is this route a high capacity connecting route needed to form an efficient network? (State Transportation Board Policy No. 5)	Yes, future traffic volume projections indicate this will be a heavily used route. It is needed to form an efficient network because of its north/south connectivity. This facility would be the only fully access controlled facility in northeast Pinal County.
7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)	Yes, this facility will provide regional movement of people and goods by providing a regional route connecting from SR-79 or SR-287 to the Loop 202. It will serve statewide travel because it will better interconnect northern Pinal County with southeast Maricopa County.
8. Designated as Interstate Highway or Urban freeway? (Per Route Transfer and Level of Development Study).	No, the North-South corridor is not currently designated as an interstate highway or urban freeway though such designation may be considered in the future.
<p>9. Does this route meet criteria for "other Major facilities" includes (Per <i>Route Transfer and Level of Development Study</i>).</p> <ul style="list-style-type: none"> ▪ Rural routes with more than 5,000 ADT ▪ Connecting rural National Highway System (NHS) routes with more than 1,500 ADT ▪ Key freight routes (more than 1,000 articulated trucks per day) ▪ Urban and rural connecting routes to form a network in which Other Major Facilities routes connect at both ends to Freeways or other Major Facilities routes 	Yes, the North-South corridor meets the fourth (bullet) criteria because it (if developed) would be an urban connecting route which forms a network at both ends to a state highway, because it connects to SR-79/SR-287 and Loop 202.

5-2 – North-South Corridor Criteria Satisfaction for Designation as State Highway (continued)

Criteria for Designation as State Highways	Degree to which North-South corridor Meets Criteria
<p>10. Does this route meet criteria for “other statewide routes” includes (Per <i>Route Transfer and Level of Development Study</i>).</p> <ul style="list-style-type: none"> ▪ Rural arterial and major collector routes with more than 1,500 ADT ▪ Urban arterial routes with more than 5,000 ADT ▪ Connecting routes necessary to form a network in which all other statewide routes connect with Freeways, Other major facilities or other statewide routes ▪ Not including business routes and other routes with parallel state highways of higher classification 	<p>Yes, if developed, the corridor is projected to carry 30,000 vehicles per day at the south end of the corridor and nearly 140,000 vehicles per day at the central and northern portions of the corridor. It will form a network connecting SR-79/SR-287 to the Loop 202. This corridor may be considered, in some segments, as a parallel route to SR-79.</p>
<p>11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest (Per <i>Route Transfer and Level of Development Study</i>).</p>	<p>Yes, this route may serve points of state and national interest including the Arizona Department of Corrections facilities located on SR-79.</p>

6. PROCESS FOR CORRIDOR DEFINITION RECOMMENDATIONS

This working paper documents the results of an assessment of corridor needs and feasibility in the study area. The Corridor Concept, which includes the North-South Corridor Definition, will be presented at public meetings to receive input from the public, stakeholders, and elected officials. Input received from public meetings will be combined by ADOT staff with the results documented in this working paper to develop corridor definition recommendations for consideration by the State Transportation Board.

Following decisions by the Board on recommended corridor definitions, corridor development should consider the following:

- § As the corridor development process advances to the definition of roadway alignments, design concepts, and environmental studies, coordinate with ongoing and future transportation planning efforts such as Small-Area Transportation Studies, the ADOT Regional Transportation Profiles, and other local jurisdiction planning efforts. These studies will recommend improvements to the local arterial network and to the state highway system in context with decisions made by the Board. The widening and preservation of access on the existing state highway system are important considerations in future corridor development activities.
- § Preserve right-of-way for future corridors. Local jurisdictions should coordinate with ADOT and Arizona State Land Department to identify and preserve right-of-way for future corridor alignments.
- § Continue development of the arterial network by local jurisdictions. Small-Area Transportation Studies are underway and more will follow which will develop local transportation plans that will include new and improved arterials. The local arterial system must be expanded to provide access to and from the new corridors. New corridors cannot function without arterial development.
- § Continue to assess the potential for high-capacity transit. Local jurisdiction's planning efforts including the upcoming Small Area Transportation studies to be conducted by Queen Creek, Pinal County, Coolidge, and Florence should address high-capacity transit alternatives.

APPENDIX A

Appendix A-1 Corridor Definition Studies Needs Analysis 'What-if' Scenarios

Table A-1 – 2030 Needs Analysis Modeling “What-if” Scenarios

Base Model Utilized for Scenario	Roadway Network Description
2030 Base Future Network	<ul style="list-style-type: none"> - All freeway corridors including 60 extension - Williams Gateway connects to 60 extension - 6 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - All freeway corridors - Without 60 extension - Williams Gateway connects to existing US 60 - 4 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - No freeway corridors - Williams Gateway ends at Meridian - 6 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - All freeway corridors - Without 60 extension - Williams Gateway connects to existing US 60 - 6 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - All freeway corridors - Williams Gateway ends at North-South - Without 60 extension - 6 lanes on existing US 60 - east/west corridors removed
2030 Base Future Network	<ul style="list-style-type: none"> - All freeway corridors - Williams Gateway ends at North-South - Without 60 extension - 4 lanes on existing US 60 - east/west corridors removed
2030 Base Future Network	<ul style="list-style-type: none"> - All Freeway Corridors (WG to NS Corridor) - Without US 60 Extension - 4 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - All Freeway Corridors (WG to NS Corridor) - Including US 60 Extension (4 Lanes) - 4 lanes on existing US 60
2030 Base Future Network	<ul style="list-style-type: none"> - Closed Freeway Loop (Williams Gateway Freeway connects to US 60 Extension) - 4 Lane Arterial on “North-South”, north of Williams Gateway Freeway
2030 Base Future Network	<ul style="list-style-type: none"> - All Freeway Corridors (WG to NS Corridor) - Including US 60 Extension (4 Lanes) - 4 Lane Arterial on “North-South”, north of Williams Gateway Freeway
2030 Base Future Network	<ul style="list-style-type: none"> - All Freeway Corridors (WG to NS Corridor) - Including US 60 Extension (6 Lanes) - 4 Lane Arterial on “North-South”, north of Williams Gateway Freeway

APPENDIX B – ENVIRONMENTAL OVERVIEW SUPPORTING MATERIALS

Appendix B-1 Environmental Databases Search Results

Table B-1 – Underground Storage Tanks (UST) Database Search Results

Facility ID	Facility Name	Address/ Location	Relative Location	Status
0-009805	Florence Jct ADOT Easements	US 60 eastbound/Florence Jct, Florence Junction, AZ 85232	Within 2000 feet of study area (ENE portion)	1 tank – temporarily closed as of 11/06/01
0-009804	Florence Jct ADOT Easements	US 60 westbound/Florence Jct, Florence Junction, AZ 85232	Within 2000 feet of study area (ENE portion)	5 tanks – all temporarily closed as of 11/06/01
0-000392	City Services Annex	575 E Baseline Ave, Apache Junction, AZ 85219-9205	Within study area (northern portion)	2 tanks – both in-use
0-008953	New Magma Irrigation & Drainage	34630 N Schnepf Rd, Queen Creek, AZ 85242-9229	Within 2000 feet of study area (western portion)	2 tanks – both removed on 11/12/99
0-009759	Ganzel Farms	25 W Ocotillo Rd, Queen Creek, AZ 85242-8859	Within 1000 feet of study area (WNW portion)	2 tanks – one in-use, other closed but no date indicated
0-008863	Rittenhouse Auxiliary Field	7 miles SE of Williams AFB, AZ 85242	Within study area (WNW portion)	1 tank – removed on 11/09/95
0-001622	Greg Combs	3379 E Combs Rd, Queen Creek, AZ 85242-9153	Within study area (western portion)	3 tanks – all removed on 04/01/89
0-009225	Tanner Companies Plant 17	Attaway Rd & Hwy 287, Coolidge, AZ 85228	Within study area (SW portion)	2 tanks – both removed on 09/18/90
0-007443	L R Johnson Settlement Trust	Arizona Farms Rd & Attaway Rd, Florence, AZ 85232	Within study area (WSW portion)	2 tanks – both removed on 06/10/92
0-004841	BCW Inc dba Sunward Materials	14152 Attaway Rd, Coolidge, AZ 85228	Within study area (SW portion)	2 tanks – both removed on 12/01/89
0-005757	A J Waste Systems Inc	3690 S Cactus Rd, Apache Junction, AZ 85219-9416	Within 1000 feet of study area (northern portion)	2 tanks – one removed on 02/21/91, other removed on 10/16/98
0-009839	Apache Jct Unified School	2535 S Ironwood Dr, Apache Junction, AZ 85220-7100	Within 2000 feet of study area (northern portion)	3 tanks – all in-use
0-009834	AJ's Mini Mart	3940 S Ironwood Dr, Apache Junction, AZ 85220-7152	Within 1000 feet of study area (northern portion)	2 tanks – one in-use, other closed but no date indicated

Table B-1 – Underground Storage Tanks (UST) Database Search Results (continued)

Facility ID	Facility Name	Address/ Location	Relative Location	Status
0-009672	RC's Quickmart	2851 S Tomahawk Rd, Apache Junction, AZ 85219-9207	Within 2000 feet of study area (northern portion)	2 tanks – one in- use, other closed but no date indicated
0-009831	Freeman Trust Property	454 N Pinal Pkwy, Florence, AZ 85232	Within 2000 feet of study area (SE portion)	2 tanks – both removed on 03/09/02
0-009605	Chevron/Minit Mart #607	520 N Pinal Pkwy, Florence, AZ 85232	Within 2000 feet of study area (SE portion)	2 tanks – one in- use, other closed but no date indicated
0-006483	Dutchman Auto/RV	770 S Pinal Pkwy, Florence, AZ 85232-9718	Within 2000 feet of study area (SE portion)	2 tanks – both removed on 07/29/98
0-003913	Pinal County Interprise Serv	900 S Pinal Pkwy, Florence, AZ 85232	Within 2000 feet of study area (SE portion)	3 tanks – all removed on 06/23/98
0-007957	Coury Brothers Ranch	Sierra Vista Dr & Queen Creek, Queen Creek, AZ 85242	Within study area (WNW portion)	1 tank – removed on 08/12/92
0-004266	St Francis Farms Inc	29560 N Cooper Rd, Florence, AZ 85232-9701	Within study area (south-central portion)	3 tanks – all removed on 03/01/87
0-010033	Farm Maintenance Yard	27830 N Yeager, Florence, AZ 85232	Within study area (south-central portion)	1 tank – temporarily closed as of 11/01/04
0-003463	Unit Training Equipment Site	600 Track Rd, Florence, AZ 85232-9704	Within study area (SE portion)	2 tanks – both removed on 03/19/97
0-000582	AT&T Florence AZ3180	Valley Farm Rd Hwy 287 2 miles, Florence, AZ 85232	Within study area (southern portion)	1 tank – removed on 11/26/91
0-009425	Old Garage	99 E Butte, Florence, AZ 85232	Within study area (SE portion)	2 tanks – both removed on 01/14/00
0-002159	Florence Waste Water Treatment	300 S Plant Rd, Florence, AZ 85232	Within study area (SE portion)	1 tank – in-use
0-003099	Ernest W McFarland Estate	Rt 1 Box 8 Canal Rd, Florence, AZ 85232	Within study area (southern portion)	2 tanks – both removed on 12/01/88
0-000378	ADOT/Pinal County Maintenance	2207 S Willow, Florence, AZ 85232	Within study area (SE portion)	3 tanks – all removed on 05/30/91
0-008409	Florence Automotive	625 S Main St, Florence, AZ 85232	Within study area (SE portion)	2 tanks – both in- use

Table B-1 – Underground Storage Tanks (UST) Database Search Results (continued)

Facility ID	Facility Name	Address/ Location	Relative Location	Status
0-008362	Clemans Cattle Co.	90 N Main St, Florence, AZ 85232	Within study area (SE portion)	3 tanks – all removed on 09/04/98
0-008361	Mobil Gas Station/Clemans	30 N Main St, Florence, AZ 85232	Within study area (SE portion)	2 tanks – both removed on 07/29/98
0-005473	Circle K #2702938	1500 S Main St, Florence, AZ 85232	Within study area (SE portion)	2 tanks – both in- use
0-005115	Express Stop #107	1501 S Main St, Florence, AZ 85232	Within study area (SE portion)	10 tanks – four removed on 07/31/03, six removed on 10/24/90
0-001280	Circle K Store #2700661	1615 S Main St, Florence, AZ 85232	Within study area (SE portion)	4 tanks – two in- use, two removed on 05/20/96
0-001031	Chevron #9-0560	25 N Main St, Florence, AZ 85232	Within study area (SE portion)	4 tanks – all removed on 07/08/93
0-009371	Central Arizona Medical Center	450 W Adamsville Rd, Florence, AZ 85232	Within study area (SE portion)	2 tanks – one in- use, other removed on 09/08/99
0-001631	Florence Project	14605 E Hunt Hwy, Florence, AZ 85232-9486	Within study area (southern portion)	3 tanks – two removed on 12/01/89, third removed on 07/18/90
0-007419	Florence Unified School District	230 E Florence Heights, Florence, AZ 85232	Within study area (SE portion)	1 tank – removed on 08/22/91
0-007616	American Telephone & Telegraph	6.4 miles on Hwy 287 S 2.8, Florence, AZ 85232	Within study area (southern portion)	1 tank – removed on 11/26/91

Table B-2 – Leaking Underground Storage Tanks (LUST) Database Search Results

Facility ID	Facility Name	Address/Location	Relative Location	Status
0-007443	L R Johnson Settlement Trust	Arizona Farms Rd & Attaway Rd, Florence, AZ 85232	Within study area (WSW portion)	1 case file – closed on 02/09/95
0-004841	BCW Inc dba Sunward Materials	14152 Attaway Rd, Coolidge, AZ 85228	Within study area (SW portion)	2 case files – one closed on 05/11/99, other closed on 11/30/99
0-003913	Pinal County Interprise Serv	900 S Pinal Pkwy, Florence, AZ 85232	Within 2000 feet of study area (SE portion)	1 case file – closed on 08/02/00
0-007957	Coury Brothers Ranch	Sierra Vista Dr & Queen Creek, Queen Creek, AZ 85242	Within study area (WNW portion)	1 case file – closed on 10/21/99
0-003463	Unit Training Equipment Site	600 Track Rd, Florence, AZ 85232-9704	Within study area (SE portion)	1 case file – closed on 06/18/97
0-000582	AT&T Florence AZ3180	Valley Farm Rd Hwy 287 2 miles, Florence, AZ 85232	Within study area (southern portion)	1 case file – closed on 06/13/96
0-009425	Old Garage	99 E Butte, Florence, AZ 85232	Within study area (SE portion)	1 case file – open (priority level 2)
0-000378	ADOT/Pinal County Maintenance	2207 S Willow, Florence, AZ 85232	Within study area (SE portion)	2 case files – one closed on 10/20/98, other closed on 07/23/99
0-008409	Florence Automotive	625 S Main St, Florence, AZ 85232	Within study area (SE portion)	1 case file – open (priority level 2)
0-008361	Mobil Gas Station/Clemans	30 N Main St, Florence, AZ 85232	Within study area (SE portion)	3 case files – two open (both priority level 2), third closed on 06/09/00
0-005473	Circle K #2702938	1500 S Main St, Florence, AZ 85232	Within study area (SE portion)	2 case files – one open (priority level 2), other closed on 03/08/00
0-005115	Express Stop #107	1501 S Main St, Florence, AZ 85232	Within study area (SE portion)	6 case files – all closed on 03/09/98
0-001280	Circle K Store #2700661	1615 S Main St, Florence, AZ 85232	Within study area (SE portion)	4 case files – three closed on 10/07/96, fourth closed on 04/20/01
0-001031	Chevron #9-0560	25 N Main St, Florence, AZ 85232	Within study area (SE portion)	1 case file – closed on 11/20/96
0-007419	Florence Unified School District	230 E Florence Heights, Florence, AZ 85232	Within study area (SE portion)	1 case file – closed on 05/14/98
0-008187	New Arizona Farms North Inc	28576 N Attaway Rd, Queen Creek, AZ 85242-8410	Within study area (WSW portion)	1 case file – closed on 08/27/93

Table B-3 – Incident Logbook Database Search Results

Incident ID	Incident Date	Address/Location	Relative Location	Chemical	Quantity
98-010-E	07/20/97	19473 N Pinal Pkwy, Florence, AZ	Within 2000 feet of study area (SE portion)	Drug lab chemicals*	0.5 gal
86-141	09/19/86	Idaho & US 60, Apache Junction, AZ	Within study area (northern portion)	Gasoline	Unknown
84-093	10/04/84	US 60, MP 207.3, Apache Junction, AZ	Within 2000 feet of study area (NE portion)	Diesel	7000 gals
89-228	08/01/89	US 60 & SR 88, Apache Junction, AZ	Within study area (northern portion)	Transformer oil	2-5 gals
01-092-E	01/31/01	NE corner Ranch & Kenworthy Rd, Queen Creek, AZ	Within study area (WNW portion)	Secondary reuse water	500,000 gals
92-157-C	10/22/92	AZ Farms Rd & Attaway Rd, Florence, AZ	Within study area (WSW portion)	Diesel	20 gals
94-049-F	09/26/94	S3T3SR8 Sun Valley Farms, Queen Creek, AZ	Within study area (western portion)	Diesel	Unknown
94-055-B	09/22/94	4500 E Sagebrush, Queen Creek, AZ	Within study area (western portion)	Misc*	Various size bottles
00-042-D	09/09/99	Skyline Dr & Quail Run Lane, Queen Creek, AZ	Within study area (western portion)	Unknown	(5) 55-gal drums
97-001-B	01/08/97	Skyline & Sierra Vista Dr, Queen Creek, AZ	Within study area (western portion)	Unknown*	None
95-019-F	07/18/95	1 m S US 60 200ft W Iron Horse (thought to be Ironwood), Apache Junction, AZ	Within 1000 feet of study area (northern portion)	Diesel	10-15 gals
89-043	02/08/89	Off Rolling Ridge, Queen Creek, AZ	Within study area (western portion)	Fungicide*	1 dry quart

Table B-3 – Incident Logbook Database Search Results (continued)

Incident ID	Incident Date	Address/Location	Relative Location	Chemical	Quantity
90-075-A	07/18/90	Attaway Rd, Florence, AZ	Within study area (SW portion)	Diesel	100 gals
86-098	07/28/86	4000 S Tomahawk, Apache Junction, AZ	Within 2000 feet of study area (northern portion)	Caustic solution	5000 gals
94-010-E	08/28/94	Florence PD	Within study area (SE portion)	Mortar*	81mm
87-002	01/06/87	Copper Basin RR RRMP 974, Florence, AZ	Within study area (southern portion)	Sulfuric acid	6500 gals
91-114-B	10/23/91	US 60, 700-900 Blk, Apache Junction, AZ	Within study area (northern portion)	Unknown liquid	55 gals
92-028-D	09/15/92	Hwy 89 (thought to be Hwy 79) S20T2SR10E, Florence, AZ (closer to Florence Junction)	Within 2000 feet of study area (ENE portion)	Unknown	Unknown

* Only threat of release on date reported

Appendix B-2 Listed and Proposed species that may occur in Pinal County, Arizona

Table B-4 – Listed and Proposed species that may occur in Pinal County, Arizona

Species	Status	Habitat Elevation Range (Ft above MSL)
Birds		
Bald Eagle	T	varies
California Brown Pelican	E	Varies
Cactus Ferruginous Pygmy-Owl	E	<4000
Mexican Spotted Owl	T	4100-9000
Southwestern Willow Flycatcher	E	<8500
Yellow-Billed Cuckoo	C	<6500
Yuma Clapper Rail	E	<4500
Fish		
Desert Pupfish	E	<5000
Gila Topminnow	E	<4500
Loach Minnow	T	<8000
Razorback Sucker	E	<6000
Spikedace	T	<6000
Gila Chub	PE	2000-3500
Mammal		
Lesser Long-Nosed Bat	E	<6000
Plants		
Acuna Cactus	C	1300-2000
Arizona Hedgehog Cactus	E	3700-5200
Nichol's Turk's Head Cactus	E	2400-4100
Total Endangered, Threatened, and Proposed Species:	17	

Key:

E — Endangered

T — Threatened

CH — Critical Habitat

PE — Taxa proposed for listing as endangered

PT — Taxa proposed for listing as threatened

PCH — Critical habitat which has been proposed

C — Candidate species for which the Fish and Wildlife Service has on file sufficient information on the biological vulnerability and threats to support proposals to list as endangered or threatened



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

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July 20, 2005

Mr. Robert Forrest
Kimley-Horn and Associates, Inc.
7878 N. 16th St.
Suite 300
Phoenix, AZ 85020

Re: Special Status Species Information for **Pinal County Corridors Definition Study**.

Dear Mr. Forrest:

The Arizona Game and Fish Department (Department) has reviewed your request, dated July 15, 2005, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records show that the special status species listed on the attachment have been documented as occurring in the project vicinity (2-mile buffer). In addition this project does not occur in the vicinity of any Proposed or Designated Critical Habitats.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Making available this information does not substitute for the Department's review of project proposals, and should not decrease our opportunities to review and evaluate new project proposals and sites. The Department is also concerned about other resource values, such as other wildlife, including game species, and wildlife-related recreation. The Department would appreciate the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project activities occurring in the subject area, when specific details become available.

Mr. Robert Forrest

July 20, 2005

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If you have any questions regarding this letter, please contact me at (602) 789-3606. General status information, county and watershed distribution lists and abstracts for some special status species are also available on our web site at <http://www.azgfd.gov/hdms>.

Sincerely,

A handwritten signature in black ink that reads "Ginger Ritter". The signature is written in a cursive style with a large, looped "G" and "R".

Ginger L. Ritter

Project Evaluation Program Specialist

SSS:glr

Attachment

cc: Rebecca Davidson, Project Evaluation Program Supervisor
Russ Haughey, Habitat Program Manager, Region VI

AGFD # 07-18-05(06)

Special Status Species within 2 Miles of the Pinal County Corridors Definition Study

NAME	COMMON NAME	ESA	USFS	BLM	STATE
<i>Agosia chrysogaster</i>	Longfin Dace	SC		S	
<i>Athene cunicularia hypugaea</i>	Western Burrowing Owl	SC		S	
<i>Catostomus insignis</i>	Sonora Sucker	SC		S	
<i>Gopherus agassizii</i> (Sonoran Population)	Sonoran Desert Tortoise	SC			WSC
<i>Nyctinomops femorosaccus</i>	Pocketed Free-tailed Bat			S	

No Critical Habitats in project area. AGFD # 07-18-05(06). Proposed Pinal County Corridors Definition Study.

Arizona Game and Fish Department, Heritage Data Management System, July 20, 2005.

GUIDELINES FOR HANDLING SONORAN DESERT TORTOISES
ENCOUNTERED ON DEVELOPMENT PROJECTS

Arizona Game and Fish Department

Revised January 17, 1997

The Arizona Game and Fish Department (Department) has developed the following guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term and/or small-scale projects, depending on the number of affected tortoises and specific type of project.

Desert tortoises of the Sonoran population are those occurring south and east of the Colorado River. Tortoises encountered in the open should be moved out of harm's way to adjacent appropriate habitat. If an occupied burrow is determined to be in jeopardy of destruction, the tortoise should be relocated to the nearest appropriate alternate burrow or other appropriate shelter, as determined by a qualified biologist. Tortoises should be moved less than 48 hours in advance of the habitat disturbance so they do not return to the area in the interim. Tortoises should be moved quickly, kept in an upright position at all times and placed in the shade. Separate disposable gloves should be worn for each tortoise handled to avoid potential transfer of disease between tortoises. Tortoises must not be moved if the ambient air temperature exceeds 105 degrees Fahrenheit unless an alternate burrow is available or the tortoise is in imminent danger.

A tortoise may be moved up to two miles, but no further than necessary from its original location. If a release site, or alternate burrow, is unavailable within this distance, and ambient air temperature exceeds 105 degrees Fahrenheit, the Department should be contacted to place the tortoise into a Department-regulated desert tortoise adoption program. Tortoises salvaged from projects which result in substantial permanent habitat loss (e.g. housing and highway projects), or those requiring removal during long-term (longer than one week) construction projects, will also be placed in desert tortoise adoption programs. *Managers of projects likely to affect desert tortoises should obtain a scientific collecting permit from the Department to facilitate temporary possession of tortoises.* Likewise, if large numbers of tortoises (>5) are expected to be displaced by a project, the project manager should contact the Department for guidance and/or assistance.

Please keep in mind the following points:

- These guidelines do not apply to the Mohave population of desert tortoises (north and west of the Colorado River). Mohave desert tortoises are specifically protected under the Endangered Species Act, as administered by the U.S. Fish and Wildlife Service.
- These guidelines are subject to revision at the discretion of the Department. We recommend that the Department be contacted during the planning stages of any project that may affect desert tortoises.
- Take, possession, or harassment of wild desert tortoises is prohibited by state law. Unless specifically authorized by the Department, or as noted above, project personnel should avoid disturbing any tortoise.

Burrowing Owl Artificial Nest Box Project

An Arizona Partners in Flight Habitat Substitution Project

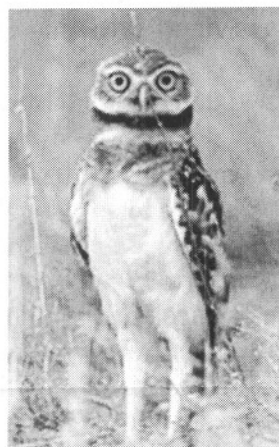


Photo by Greg Clark

Project and Problem Summary:

In the Eastern United States artificial nest boxes were built by volunteers and organizations to try to increase the populations of Bluebirds. The nest boxes replaced natural tree cavities that had been lost when the trees were lost. The effort was a huge success. The same thing can be done for Burrowing Owls, except the cavity is in the ground. If someone chops down all the trees in a forest, everyone understands that this will have a devastating effect on the wildlife. It is not as obvious that as much damage can be done to some species when holes in the ground are covered up. Efforts are under way to figure out where replacement burrows can be installed that will have the most benefit. Some burrows have been installed to replace burrows lost nearby to development, and much of the following material shows this work. However, these burrows are part of rescue work done in conjunction with Wild At Heart (a rehabilitation group in Cave Creek, Arizona). As important to the owl as rescue work is, it is different from figuring out where to install burrows to attract new populations of owls. Phase I of the project is about finding landowners who will provide burrow sites and learning which sites the Burrowing Owl prefers. We need your help finding sites and installing burrows. Surprisingly, this is not some problem to be solved in the "wilderness." The burrows need to be installed in urban areas where development is already completed. That means all around where people live. We need niche areas, like around commercial buildings or urban greenbelts, where the burrows can be installed away from trees and buildings but near possible food sources (mice and insects). There is still time to reverse the steep decline in the Burrowing Owl population, with your help. If you live in the greater Phoenix area, you can help us directly with this project. Because Arizona is the winter home for many owls that breed in Canada and the states north of Arizona, this project can affect the entire owl population of North America. We need burrow sites and help digging the holes. If you can help, or if you would like more information about how to help the owls in your area, contact Greg Clark at:

480-961-4046 (or manually type in the e-mail address birdinfo@mirror-pole.com without spaces)

The Burrowing Owl is Federally protected by U.S. Laws pertaining to Migratory Species. If you are contemplating an operation that could destroy a burrow, or cover up a burrow with dirt, possibly killing the owl inside, this is against the law. You can find out more about this where the list of protected birds

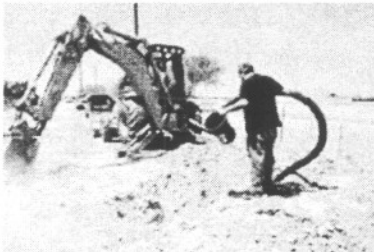
is given on a U.S. Fish and Wildlife website:

<http://migratorybirds.fws.gov/intrnltr/treatlaw.html#mbta>

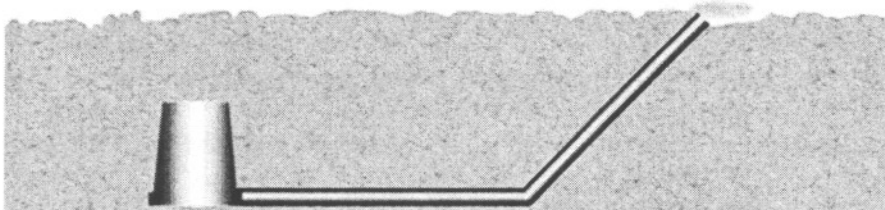
<http://migratorybirds.fws.gov/intrnltr/mbta/mbtandx.html#alpha1> The list of protected birds can be found here, look under Owls to find Burrowing Owl.

More about the Burrowing Owl and artificial burrows:

One of North America's most engaging and beneficial birds, the Burrowing Owl is experiencing a decline in population as nest sites are lost to development. Unlike birds that nest in trees, the Burrowing Owl is dependent on a ground burrow dug by other animals. If the animals are displaced, and the burrows covered over, then the Burrowing Owls must also leave. Eventually, the population of owls begins to fall merely because of a lack of suitable ground nest sites. Unlike other owls that are typically most active at night, the Burrowing Owl is most active during the day. Engaging to watch, the owl also makes a wide range of intriguing sounds. Typically perched near its burrow during the day, the owl is often easy to spot and is a great educational resource for anyone interested in learning more about wildlife. Surprisingly, this owl often selects natural nest sites on bare ground in open areas with little surrounding vegetation. Many commercial and city-maintained areas in the greater Phoenix area would be ideal for artificial burrows because the open spaces around the buildings are often bare ground, free of grass and large trees. The idea that these types of spaces could be used for habitat substitution for the Burrowing Owl has led to this project and we need to find interested groups that can help us make new home sites for this owl. Working in conjunction with Wild at Heart, based in Cave Creek, Arizona, some artificial burrows have been provided to replace burrows that are being lost due to development. This work shows what is involved to install a burrow.



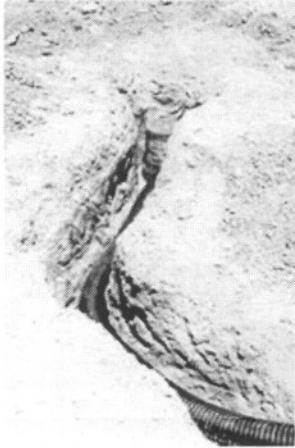
Here volunteer Brian DaSilva gets ready to check the depth of the hole and tunnel dug by a backhoe to see if the orange bucket and black hose will fit properly. A typical hole is dug 4 feet deep so that the average temperature in the burrow will be around 75 degrees F. The developer worked with us both to provide a site for the burrows in Peoria and to carry out the earth excavation, so that very little manual labor was involved. Burrows can also be dug by hand.



An underground burrow is built using a plastic bucket for the burrow and 4" flexible irrigation hose for the tunnel from the ground to the burrow. The orange bucket costs about 3 dollars at Home Depot and the 4" hose

costs about 6 dollars for the 12 feet required for a typical burrow. This means that materials are less than 10 dollars per burrow. For protection from dogs, in locations where the burrows are not in protected areas (like in fenced-off areas) a rigid PVC pipe must be used to protect the burrow entrance. See the special link for hardening a burrow against dog attacks. Holes must be provided in the bucket and hose to allow water to escape into the ground, the flexible hose can be purchased with perforations. In addition, the hose must make a double turn between the burrow and the surface to simulate natural burrows. The simple diagram above only shows the tube bending toward the surface, but it also needs to

bend horizontally 90 degrees. The photograph below shows the bucket and tubing in place before being buried. The section from the burrow to the bend should be at a 4-foot depth. If you want to proceed on your own, contact us for more detailed information.



This is an example of a burrow dug by hand, rather than by backhoe. There must be at least two feet of dirt on top of the over-turned bucket. The photo shows the bucket and hose before being buried.

This burrow in Chandler became the home for owls that were displaced for a 200-home development project.

Once an area is slated for development where there are Burrowing Owls present, someone must carefully investigate all the burrows to make sure no owls are inside and then carefully collapse the burrow so no owl can return to be trapped inside. One of the first things that happens at a development site is land preparation that moves all the surface dirt around. Sadly, this can trap the owls in the burrow. Investigating these burrows is where Wild At Heart comes in.

Holder of both Arizona Game and Fish and U.S. Fish and Wildlife permits for doing this type of work, Wild At Heart can investigate and safely collapse the burrows and, where necessary, relocate the owls to new sites. Follow the next link to see some burrow sites in Chandler, Arizona where the burrows had to be collapsed. Fortunately, a nearby homeowner offered to help us with our artificial burrow project and so the owls were able to relocate only a few hundred feet from where they were born, in habitat much like where they lived before.

[Additional Burrow Construction Information and Protection Needed for Domestic Dog Attacks](#)

[Arizona Burrowing Owl Distribution](#)

[More Burrow Sites and Owl Photos](#)

[Red Hawk Power Plant Release Site](#) New June, 2002. See where 25 Burrowing Owls were released.

[Paseo Verde School](#) New May, 2003. See the owls in one of the burrows using infrared video cameras.

[mirror-pole.com home](#)

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APPENDIX C – CORRIDOR DEFINITION STUDY PERFORMANCE ANALYSIS

technical memorandum

Corridor Definition Study Performance Analysis

prepared for

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1.0 Introduction

This technical memorandum describes the system performance evaluation of corridor alternatives analyzed as part of the Arizona Department of Transportation's (ADOT) three Corridor Definition Studies. The technical memorandum describes both the methodology used to calculate system performance for several performance factors and the results of this analysis. These results will be used to support the overall analysis of corridor alternatives for each of the three studies.

The performance analysis presented here is one piece of the overall analysis process for ADOT's Corridor Definition Studies. The findings presented need to be evaluated in context with other information generated for these studies, including:

- The demand for the proposed corridors;
- The impact of the proposed corridors on the congestion of the arterial network and existing state transportation system;
- The feasibility of implementing a particular corridor; and
- The system performance and congestion benefits of a new corridor relative to the cost to develop that corridor.

The results presented here are not intended to stand alone. The identification of a recommended corridor concept will utilize this system performance information in concert with the above noted information. The details of how this analysis fits with the overall analysis can be found in the second working paper for each of the studies.

2.0 Methodology

The methodology for calculating system performance is based on the performance-based planning direction established by ADOT as part of the Arizona Long-Range Transportation Plan (MoveAZ). The process was developed using several key tools and is reported at several levels. This section of the technical memorandum describes the following:

- The scenarios that were evaluated;
- The performance measures used to evaluate these scenarios, including a summary of tools and methods to calculate each measure; and
- The levels of analysis for the evaluations.

■ 2.1 Scenarios

The needs analysis process used for each of the three ongoing ADOT Corridor Definition Studies included identification of potential corridor alternatives. Over 20 individual concepts were evaluated as part of the needs analysis process. For the purpose of the system performance analysis, five key alternatives were evaluated, including the following:

1. **Base Future.** This scenario represents the expected future transportation system in the overall study area in 2030. It is based on existing plans that overlap the study area and assumptions about the basic arterial network needed to support expected future development. Each of the scenarios is compared to the base future.¹
2. **Enhanced Future.** The enhanced future scenario evaluates the benefits that would result from additional investments in the arterial system in Pinal County. It is focused primarily on developing a more mature arterial system in the portion of Pinal County that is currently State Trust Land, but is expected to have substantial additional

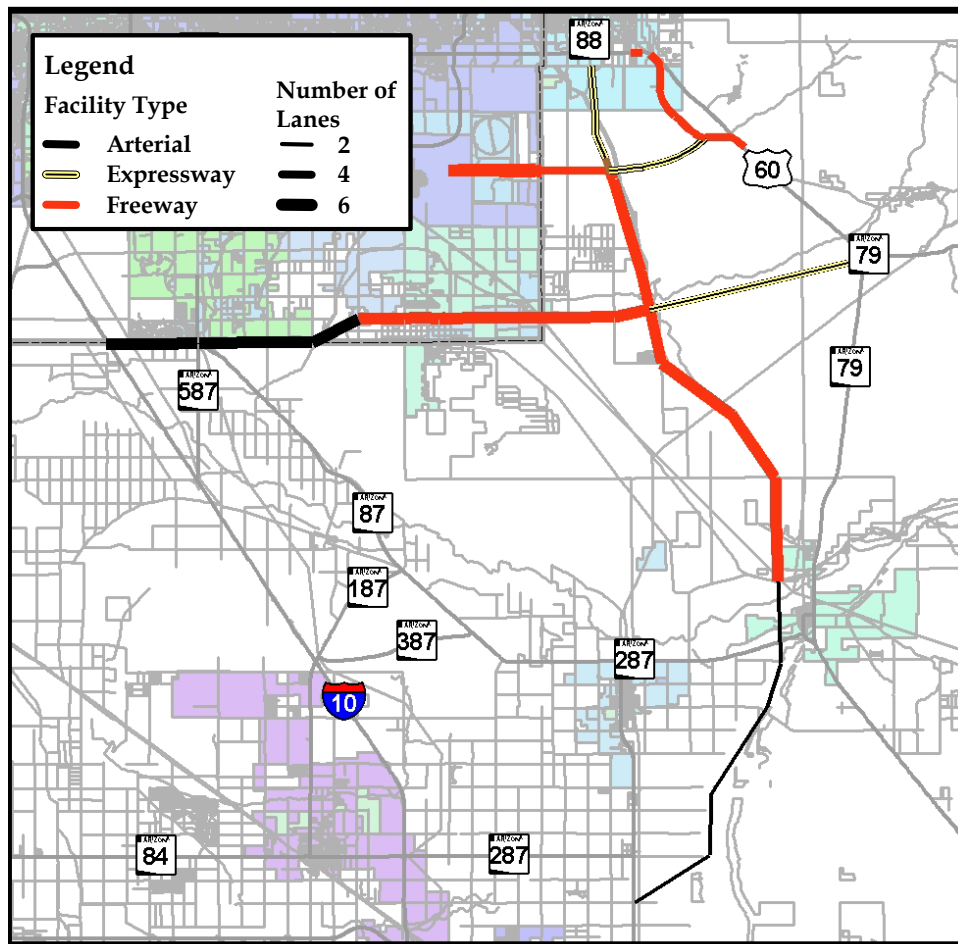
¹ Additional information about the base future scenario can be found in *Working Paper #1*, which was developed for each of the three Corridor Definition Studies. These reports are available at: <http://tpd.azdot.gov/planning/corridorstudies.php>.

population by 2030.² In addition, this scenario assumes that all of the existing state highways in Pinal County that are currently two lanes will be widened to four lanes.

3. **SEMNPPTS Corridors.** This is the first primary concept analyzed as part of the overall needs analysis. This concept included each of the four corridors identified as part of the *Southeast Maricopa County/Northern Pinal County Transportation Study* (SEMNPPTS).
4. **Refined All Corridors.** Based on demand estimates from the base future concept and SEMNPPTS Corridors, a refined all corridors analysis was identified. This includes an updated specification for each of the four corridors identified in SEMNPPTS. This concept is described in Figure 2.1.
5. **Corridor Concept.** This concept is based on the results of the Refined All Corridors concept and represents the final result of several separate model runs analyzed during the needs analysis process. The concept includes two new corridors: 1) a combined Williams Gateway to North-South corridor and 2) a U.S. 60 reroute, both as six-lane facilities. The two corridors are presented in Figure 2.2.
6. **Corridor Concept Plus.** This concept is based on the corridor concept, but includes widening the existing state highway system in Pinal County to four lanes.

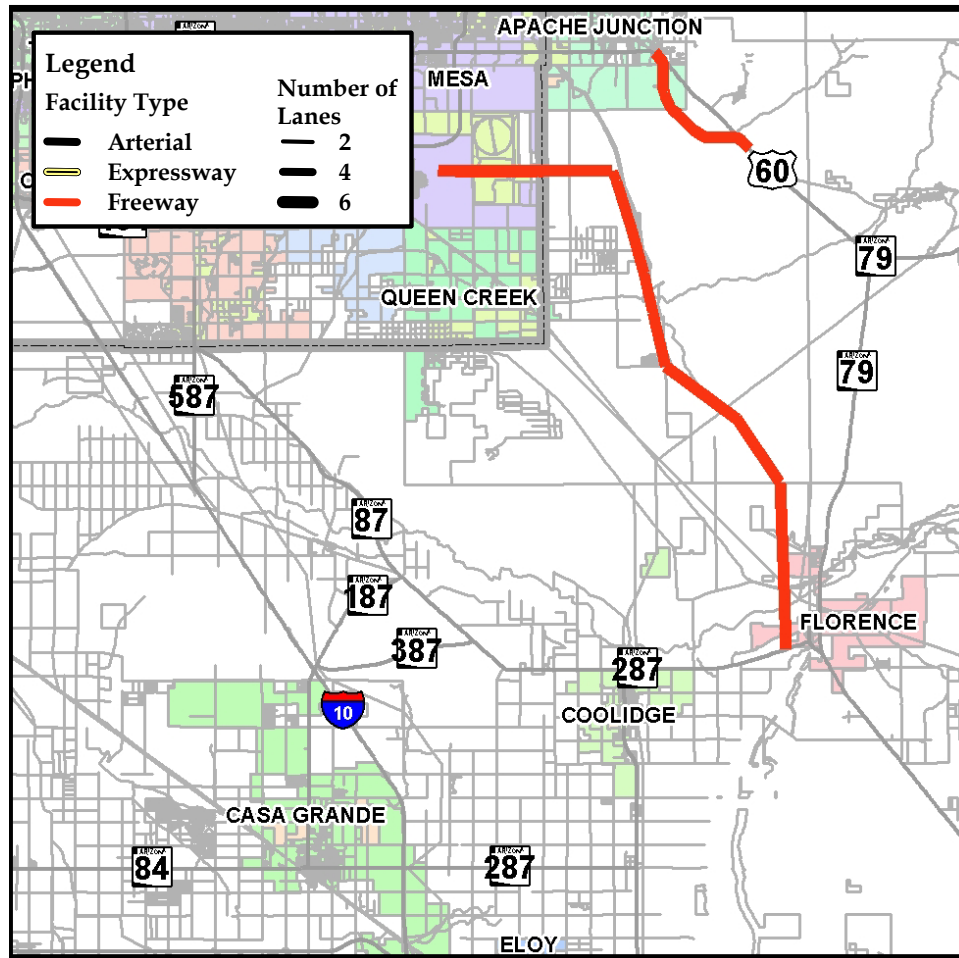
² Additional information about expected population and employment growth in the study area can be found in the *Pinal County Planning Model: Socioeconomic Estimates and Forecasts* document. This report is available at: <http://tpd.azdot.gov/planning/corridorstudies.php>.

Figure 2.1 Refined All Corridors Concept



Note: This is the Refined All Corridors concept, based on demand estimates from the Base Future concept at the All Corridors (SEMNPIS) concept. This includes an updated specification for each of the four corridors identified in SEMNPIS

Figure 2.2 Corridor Concept



■ 2.2 Performance Measures and Tools

The alternatives described above were evaluated using a common set of performance measures that are linked to key planning factors established by ADOT as part of MoveAZ. The five factors evaluated as part of this process include:

- **Mobility;**
- **Safety;**
- **Accessibility;**
- **Resource conservation;** and
- **Environmental justice.**

A performance analysis database was created to generate measures using analytic procedures and data from several sources, including:

- The **Pinal County Planning Model (PCPM)** is a travel demand model developed for the three Corridor Definition Studies. The model was the primary source of data on roadway conditions, projected traffic volumes, and roadway capacities.
- The **ITS Deployment Analysis System (IDAS)** is a sketch-planning tool that was designed to estimate the potential benefits of ITS and operational investments using data from a travel demand model. As part of the IDAS development process, performance measures were developed to evaluate alternatives, including data needed to support these analyses. IDAS includes measures of congestion, safety, air quality, fuel consumption, and economic impacts. For the purposes of this evaluation process, IDAS routines were used in the evaluation of the safety and resource conservation performance factors.
- The **Highway Capacity Manual (HCM)** is a guidebook published by the Transportation Research Board as a means to standardize the techniques used to evaluate the quality of service provided by various transportation facilities. The HCM was used to develop measures of congestion and level of service for the mobility performance factor.
- The **Highway Performance Monitoring System (HPMS)** is a dataset that represents public roads throughout the country. It provides a summary of roadway conditions, features, traffic volumes, and other attributes. These data were used to supplement data from the PCPM, including truck percentages and other related information.

Table 2.1 presents the performance measures used to address each of the key planning factors identified above.

Table 2.1 System Performance Measures

MoveAZ Planning Factor	Performance Measures	Tools
Mobility	<ul style="list-style-type: none"> • Vehicle Miles of Travel (VMT) • Vehicle Hours of Travel (VHT) • Percent of Network that is Congested 	<ul style="list-style-type: none"> • PCPM • PCPM • PCPM, HCM
Safety	<ul style="list-style-type: none"> • Crash rate (Fatality, Injury, PDO) 	<ul style="list-style-type: none"> • IDAS, HPMS, PCPM
Accessibility	<ul style="list-style-type: none"> • Access to existing employment centers 	<ul style="list-style-type: none"> • PCPM, GIS Spatial Analysis
Resource conservation	<ul style="list-style-type: none"> • Fuel consumption • Emissions (CO₂, NO_x, HC) 	<ul style="list-style-type: none"> • PCPM, HPMS, IDAS • PCPM, HPMS, IDAS
Resource Conservation/ Accessibility	<ul style="list-style-type: none"> • Environmental Justice 	<ul style="list-style-type: none"> • 2000 Census, GIS analysis

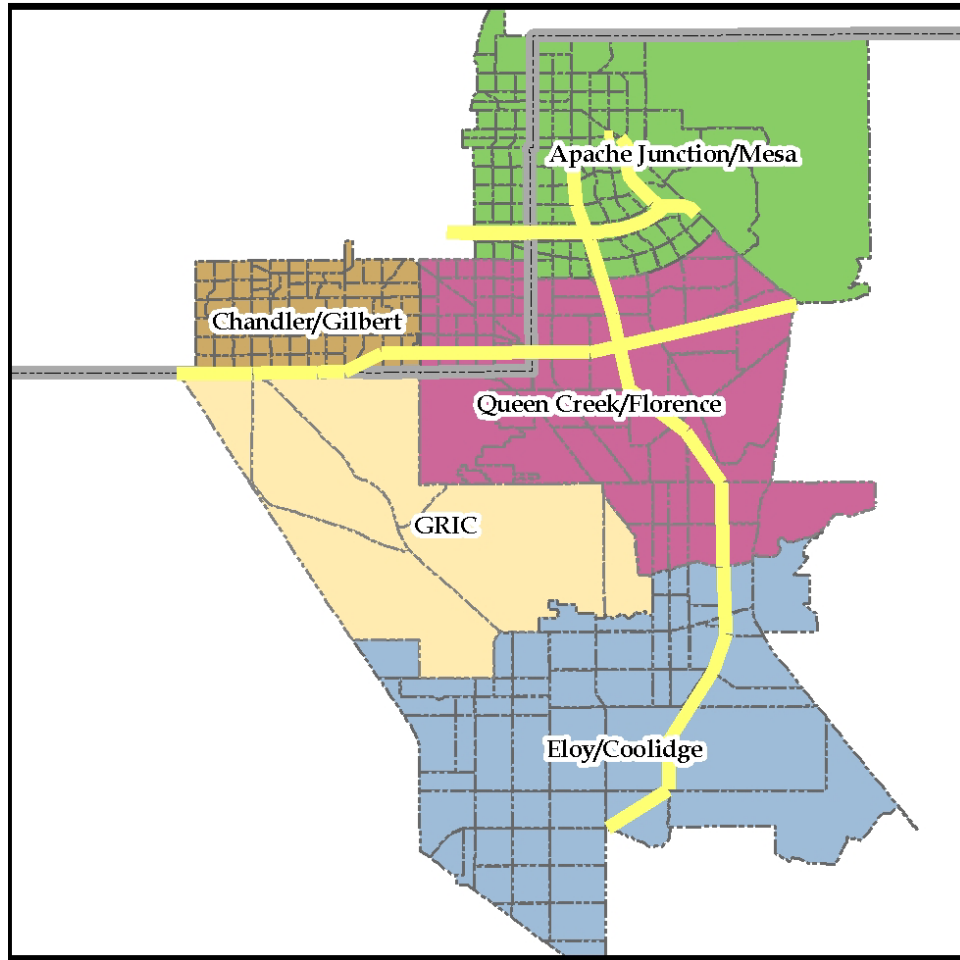
The methods used to operationalize and calculate each of the measures are described within the results section below.

■ 2.3 Level of Analysis

The performance analyses were conducted at several levels. The primary level was for the overall transportation system. This system-level analysis included the entire study area as defined by the PCPM, except roads to the west of I-10 and to the east of the U.S. 60/SR 79 junction. In addition, the performance evaluation was calculated for each of five separate study areas that represent key divisions in the overall study area (Figure 2.3). The subareas were divided as follows:

- Apache Junction, Mesa, and Gold Canyon;
- Chandler and Gilbert;
- Queen Creek, San Tan, and Florence;
- The Gila River Indian Community (GRIC); and
- Coolidge, Eloy, and Casa Grande.

Figure 2.3 Study Areas for Corridor Performance Measure Evaluation



3.0 Results

This section describes the detailed performance analysis for each of the four key performance factors. For each factor, additional information is provided about the methodology used to calculate the specific measures and performance results are presented.

■ 3.1 Mobility

The following three key measures were used to estimate mobility:

1. **Vehicle miles of travel (VMT)** provides a system-level estimate of total travel on the system. Increases in VMT above the base future scenario reflect latent demand that is not satisfied with the expected future transportation network.
2. **Vehicle hours of travel (VHT)** provides a system-level estimate of the total time spent traveling on the roadway network. The relative change in VHT and VMT compared to the base scenario represents travel time savings provided by new investments.
3. **Percent of miles in congested condition** provides an assessment of the level of congestion experienced on the roadway network. This measure is captured at two levels. The first level is the percent of highway miles that have a vehicle to capacity ratio over 1 (indicating that the number of vehicles attempting to use the road exceeds the capacity). The second level is the percent of highway miles that have a vehicle to capacity ratio over 1.5. This latter condition can be thought of as roads that are highly congested.

VMT grows slightly over the base future scenario for all scenarios, except enhanced future (Table 3.1). This growth, ranging between one-half of a percent and about 2.5 percent, represents additional latent demand that is not satisfied by the base future case. The decline in VMT for the enhanced future of 1.5 percent suggests that trips are more direct in this scenario, but that the additional capacity does not provide improved mobility for the latent demand.

Table 3.1 Mobility Performance Measures by Scenario

Scenario	Total VMT	VMT Deviation from Base	Total VHT	VHT Deviation from Base	Percent of Network Congested (v/c > 1)	Percent of Network Very Congested (v/c > 1.5)
Base Future	32,113,122		4,551,023		41.0%	7.9%
Enhanced Future	31,619,784	-1.54%	3,261,492	-28.33%	32.2%	3.0%
SEMNPTS Corridors	32,973,195	2.68%	2,682,051	-41.07%	26.1%	2.1%
Refined All Corridors	32,955,369	2.62%	2,497,108	-45.13%	24.4%	1.7%
Corridor Concept	32,438,746	1.01%	3,207,121	-29.53%	29.2%	3.5%
Corridor Concept Plus	32,252,439	0.43%	2,994,424	-34.20%	27.9%	2.8%

For all scenarios, vehicle hours of travel decline significantly, representing improved travel conditions and the use of shorter travel paths for some trips. The decline in hours of travel is lowest for the Enhanced Future scenario (just under 30 percent) and greatest for the Refined All Corridors scenario (about 45 percent). The Corridor Concept scenario provides just slightly more benefit than the enhanced future, in part due to the additional demand attracted to these new facilities. The Corridor Concept Plus scenario shows much greater benefits, as a number of congested state routes (such as SR 87 through the Gila River Indian Community) are widened to four lanes in this scenario.

Overall congestion declines in each of the scenarios and mileage that is very congested improves significantly. Total congested mileage declines from about 40 percent of all roadway miles in the Base Future scenario to between 25 and 30 percent, depending on the scenario. The Refined All Corridors scenario provides the greatest benefit, with the Corridor Concept Plus providing close to the same benefit (within 3 percent). Roadways that are very congested are reduced by over 50 percent in all scenarios (from almost 8 percent to between 1.5 and 3.5 percent).

By subarea, changes in mobility are directly related to locations of proposed routes. Table 3.2 compares the mobility measures across the subareas for the Base Future and Corridor Concept Plus scenarios. VMT increases in the Apache Junction/Mesa and Queen Creek/Florence subareas in the Corridor Concept Plus scenario. Similarly, VHT declines are most significantly in these two subareas (between 45 and 60 percent reduction in total VHT in the Corridor Concept Plus scenario), but also improves substantially in both the Eloy/Coolidge and the GRIC subareas (between 20 and 30 percent reduction in VHT). It is especially notable that the corridors both increase traffic and reduce total hours of travel, representing substantial delay savings from the new facilities.

Table 3.2 Mobility Performance Measures by Subarea and Scenario

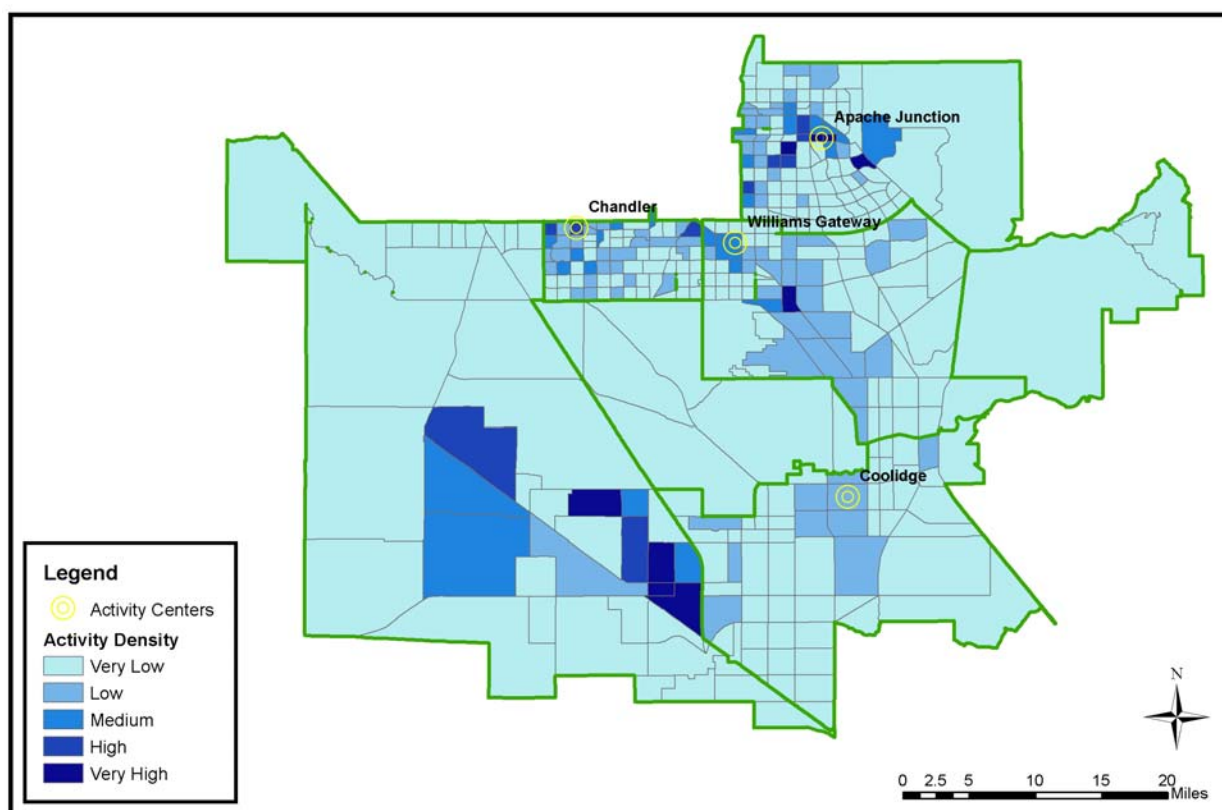
	Total VMT	VMT Deviation from Base	Total VHT	VHT Deviation from Base	Percent of Network Congested (v/c > 1)	Percent of Network Very Congested (v/c > 1.5)
Apache Junction/Mesa						
Base Future	7,896,442		741,843		30.9%	2.8%
Corridor Concept Plus	8,252,473	4.5%	308,496	-58.4%	7.4%	0.2%
Chandler/Gilbert						
Base Future	6,273,553		895,672		71.8%	1.6%
Corridor Concept Plus	6,148,579	-2.0%	878,372	-1.9%	69.9%	1.4%
Eloy/Coolidge						
Base Future	6,042,944		218,030		7.6%	0.4%
Corridor Concept Plus	5,405,756	-10.5%	170,819	-21.7%	2.8%	0.4%
GRIC						
Base Future	5,298,075		1,120,126		68.2%	33.0%
Corridor Concept Plus	5,055,372	-4.6%	790,131	-29.5%	64.9%	14.1%
Queen Creek/ Florence						
Base Future	6,602,108		1,575,353		65.2%	20.1%
Corridor Concept Plus	7,390,260	11.9%	846,607	-46.3%	40.8%	6.1%

The most significant congestion benefits are in the Apache Junction/Mesa subarea. Total network congestion is reduced from about 30 to about 7 percent in this subarea in the Corridor Concept Plus, and less than 1 percent of the overall network is very congested. The new corridors have a substantial impact on congestion in Eloy/Coolidge as well, but this area is expected to have relatively little congestion at all (just over 7 percent of roadway miles are congested). The corridors have relatively little impact on overall congestion for either the Chandler/Gilbert or the GRIC subareas. However, in the Corridor Concept Plus scenario, the percent of miles that are very congested in the GRIC subarea is less than one-half that of the Base Future scenario. Finally, the Corridor Concept Plus scenario does benefit the Queen Creek/Florence subarea in both miles that are congested and very congested, but a significant percentage of roadway miles remain congested (about 40 percent). This reflects the lack of a mature arterial network in the study area, especially for north-south movements in Queen Creek.

■ 3.2 Accessibility

For this analysis, accessibility captures the ease of access to key activity centers. An indication of regional accessibility is the accessibility to key activity centers in the region such as employment centers, regional shopping centers, airports, and other regionally critical activities. Figure 3.1 illustrates the distribution of the activity throughout the PCPM model area and identifies five activity centers that were chosen for this analysis: Apache Junction, Chandler, the Williams Gateway Airport, and Coolidge.

Figure 3.1 Distribution of Activity and Selected Activity Centers



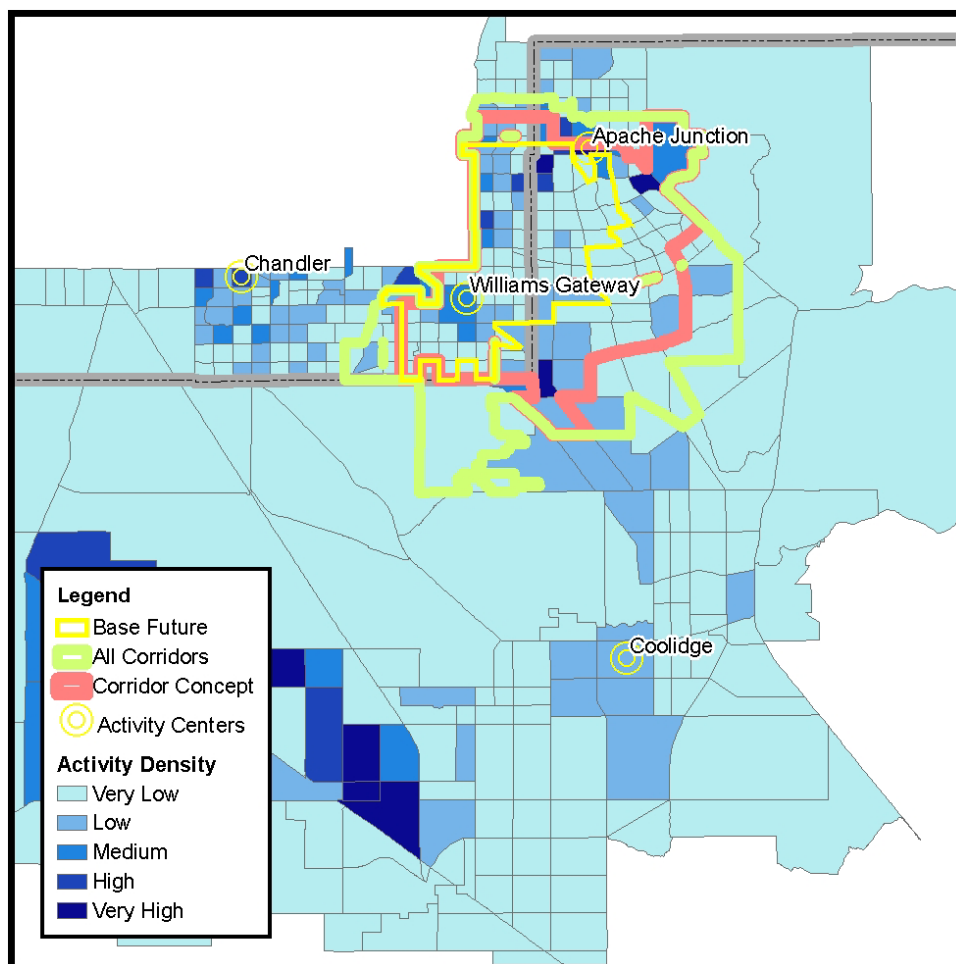
Accessibility is presented in two ways:

1. **Color gradient maps** are used to present a geographic representation of the travel time to reach the specific activity centers identified above. These illustrate the amount of time it takes to travel to a zone containing a key activity center, using 15-minute increment bands.
2. **Trips within travel time bands** are also presented for each activity center to understand what percent of total traffic can access each activity center within the travel time

bands. The travel time for each trip to the activity center zone is calculated based on the predicted volumes on roadways in the study area and partitioned into the travel time bands. Total trips are presented for zones within a band and the activity center.

The proposed scenarios provided increased accessibility for the major activity centers identified above. Figure 3.2 presents the portion of study area zones that can access the Williams Gateway activity center within 30 minutes. Results are provided for each of three scenarios: 1) Base Future, 2) Refined All Corridors, and 3) Corridor Concept. Zones that are within the bands can be accessed within 30 minutes. Similar results have been developed for 15-minute and 45-minute bands. These results can be found in Appendix A.

Figure 3.2 30-Minute Accessibility Bands by Scenario
Williams Gateway Activity Center

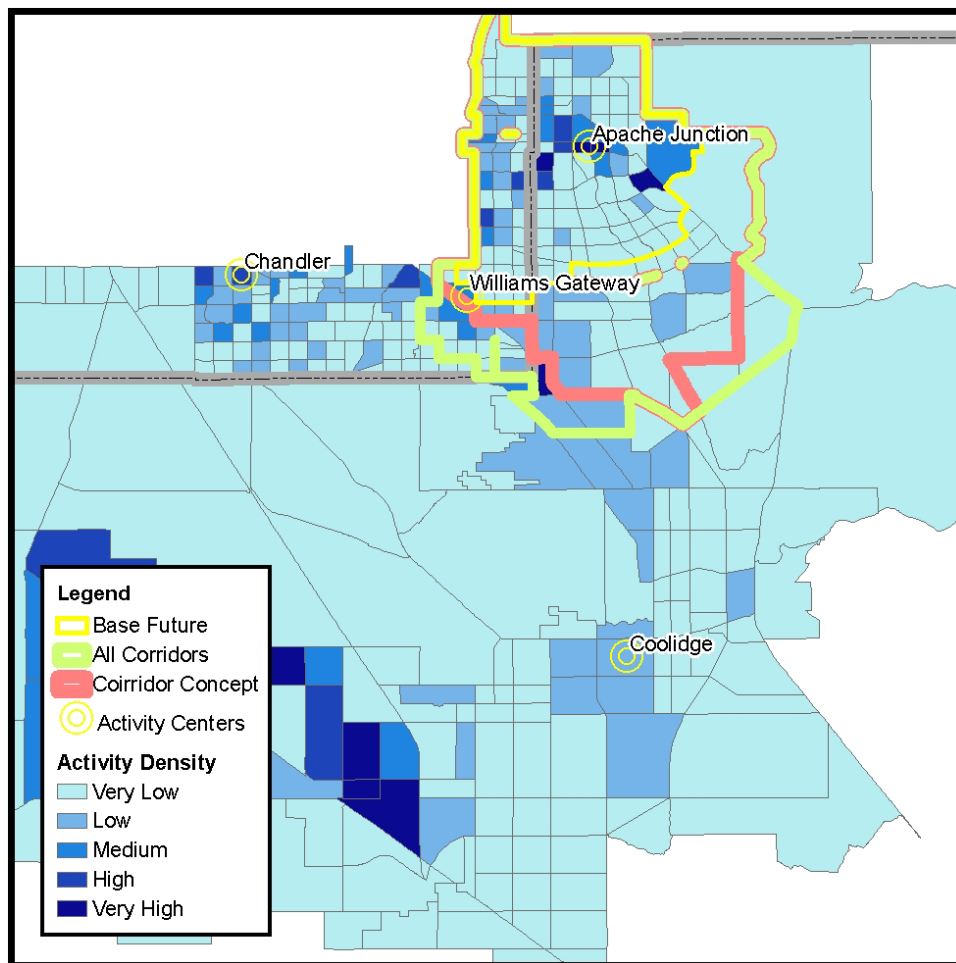


Overall, both the Refined All Corridors and Corridor Concept provide improved access to the Williams Gateway activity center. Most of the improved access is on the eastern part

of the study area, with the Refined All Corridors scenario providing some additional access to the west and south.

Figure 3.3 presents the same information for the Apache Junction activity center. For this activity center, both the Corridor Concept and the Refined All Corridors scenarios provide additional access. Again, the Refined All Corridors scenario provides additional access to the west and south of the PCPM area, but at a relatively lower level than for the Williams Gateway activity center.

Figure 3.3 30-Minute Accessibility Bands by Scenario
Apache Junction Activity Center



The other two activity centers show no real differences among the scenarios in the number of zones that can access the activity centers within 30 minutes.

By examining accessibility at a trip-based level, the impact of each zone becomes clearer. For example, a small zone that produces a large number of trips will be relatively more

significant than a small zone that produces few. Also, the number of trips generated by a zone between scenarios may change even if it remains in the same travel time band.

Analysis of travel times with respect to the base case shows significant improvement across all activity centers and scenarios. For almost all activity centers, the majority of trips fall within the zero to 15-minute band, and almost none originate outside of the 45-minute band (Table 3.3). This reflects the estimates of average trip lengths identified by the PCPM, as well as the congestion and travel times that people in this region currently accept.

Table 3.3 Trips within 15-Minute Time Band for Each Activity Center and Scenario

	Apache Junction	Chandler	Williams Gateway	Coolidge
Base Future	50.1%	58.3%	27.9%	73.5%
Enhanced Future	55.2%	63.0%	28.7%	82.7%
Refined All Corridors	77.9%	61.2%	47.1%	83.1%
Corridor Concept	73.6%	60.7%	30.3%	81.9%
Corridor Concept Plus	73.6%	60.7%	31.0%	83.0%

With respect to variation between scenarios, activity centers in closer proximity to proposed corridors show the greatest improvement when corridor scenarios are enacted (Apache Junction, Williams Gateway). Those located in a more neutral zone (Chandler, Coolidge) show less variation with the addition of corridors in comparison to the Base Future scenario. Of the corridor options, the Refined All Corridors scenario has the most impact followed by the Corridor Concept Plus scenario. This is logical as it reflects the degree of development in each scenario.

Much of the improvement with the implementation of each scenario comes in the shift in trips from the 15 to 30-minute band to the 0 to 15-minute band. Changes in the Williams Gateway activity center show relatively little change in the 0 to 15-minute band, but a visible shift from the 30 to 45-minute band to the 15 to 30-minute band (Table 3.4). The notable exception is the Refined All Corridors scenario, where the 0 to 15-minute band increases by 20 percent. However, for trips less than 30 minutes (the first two bands combined), the Refined All Corridors and the Corridor Concept Plus scenarios are within a few points.

Table 3.4 Time Band Breakdown for Williams Gateway Activity Center by Scenario

	0-15	15-30	30-45
Base Future	27.9%	9.7%	23.0%
Enhanced Future	28.7%	24.3%	12.9%
Refined All Corridors	47.1%	25.8%	14.5%
Corridor Concept	30.3%	27.2%	14.0%
Corridor Concept Plus	31.0%	32.2%	8.3%

■ 3.3 Safety

Safety is measured using **total crashes** by type (fatality, injury, and property damage crashes). Analysis breaks this figure into subcategories – fatality, injury, and property-damage-only (PDO) crashes – using predetermined ratios dependant on the network. Crash statistics are presented per million vehicle miles traveled. Crash statistics were estimated using crash rates developed for IDAS. These rates vary by type of facility and average speed.

Results of a detailed analysis of safety findings show that the three corridor scenarios have the greatest impact on decreasing accident rates on a systemwide level, ranging from 6.5 to almost 9 percent (Table 3.5). The change in the Enhanced Future scenario is negligible. For total crashes, the Refined All Corridors scenario has the greatest impact with a decrease in total crashes of nearly 9 percent. The difference between Corridor Concept and Corridor Concept Plus proposals at the systemwide level is insignificant.

Examining the type of incident, most of the additional benefit realized as part of the Refined All Corridors scenario (over the Corridor Concept and Corridor Concept Plus scenarios) is in property damage crashes. Fatalities and injuries are each only about two percent lower in the Refined All Corridors Scenario.

Three subareas show interesting variations in crash rate improvements by scenario (Table 3.6). In the Chandler/Gilbert study area, the Refined All Corridors scenario actually increases the crash rate. This is because crash rates often increase with increased speeds, creating potential new safety hazards. In particular, the severity of incidents increases sharply with increased speeds. Notably, this analysis does not account for any potential mitigation measures that might help reduce crashes in a particular corridor. For this subarea, the Corridor Concept Plus provides the greatest reduction in crashes (at two percent).

Table 3.5 Safety Performance Measures by Scenario

	Crashes Per Million VMT				Total Crashes - Deviation from Base
	Fatalities	Injuries	Property Damage	Total Crashes	
Base Future	0.483	46.202	66.498	113.182	
Enhanced Future	0.480	45.813	66.068	112.362	-0.73%
SEMNPTS Corridors	0.437	41.380	59.074	100.891	-10.86%
Refined All Corridors	0.446	42.230	60.409	103.084	-8.92%
Corridor Concept	0.456	43.267	62.051	105.774	-6.55%
Corridor Concept Plus	0.456	43.214	61.987	105.656	-6.65%

Table 3.6 Safety Performance Measures by Subarea and Scenario

Subarea	Scenario	Total Crashes - Deviation from Base
Chandler/Gilbert	Enhanced Future	-0.9%
	SEMNPTS Corridors	-0.7%
	Refined All Corridors	5.5%
	Corridor Concept	-0.1%
	Corridor Concept Plus	-2.0%
Eloy/Coolidge	Enhanced Future	-11.7%
	SEMNPTS Corridors	16.1%
	Refined All Corridors	-9.3%
	Corridor Concept	-11.6%
	Corridor Concept Plus	-13.5%
GRIC	Enhanced Future	3.5%
	SEMNPTS Corridors	-13.3%
	Refined All Corridors	-14.4%
	Corridor Concept	-7.9%
	Corridor Concept Plus	0.1%

The Eloy/Coolidge subarea shows the greatest improvements over the base case. Each of the scenarios decreases the crash rate between 9 and 14 percent, with the greatest benefit to the Corridor Concept Plus scenario.

In the GRIC subarea, the Refined All Corridors scenario has the greatest impact on crash rates, as some trips shift off of the facilities within this subarea and onto the new corridors. In the Corridor Concept Plus scenario, the rate actually increases slightly, as the newly-widened state highway in this area shows substantially improved speed. Again, this does not take into account any potential changes to this facility that could help mitigate increases in crash rates. For example, widening a major state highway from two to four lanes could also include installation of a median and other safety devices that would substantially reduce crashes on the facility.

The other two subareas (not shown in Table 3.6) had changes in crash rates that are consistent with the overall change presented in Table 3.5.

■ 3.4 Resource Conservation

The following two performance measures were used to estimate the resource conservation factor:

1. **Fuel consumption** provides a measure of resource use that varies with traffic volumes and congestion levels. Extreme congestion (stop-and-go traffic) leads to high levels of fuel consumption. However, the relationship between fuel consumption and travel speeds is not linear. A completely free-flow travel network will have higher fuel consumption than a moderately congested network. Fuel consumption rates were derived from IDAS.
2. **Emissions** provide an estimate of the environmental impact of the level of use of the transportation system. Emissions are estimated using the tonnage of key pollutants emitted due to travel on the roadway network. Specific pollutants included in analysis are nitrous oxides (NO_x), hydrocarbons (HC), and carbon monoxide (CO). Travel speeds have similar impacts on this performance measure as they do on fuel consumption. Emissions rates were also derived from IDAS for this analysis.

Each of the scenarios leads to a decrease in fuel consumption and the production of emissions relative to the Base Future scenario (Table 3.7). This suggests that the various alternatives are moving the network from high levels of congestion to moderate or acceptable levels of congestion. For both fuel consumption and emissions, the Refined All Corridors and Corridor Concept Plus scenarios have the greatest impact. The Enhanced Future and Corridor Concept scenarios show similar improvements to both fuel consumption and

emissions, each three to four percent lower than the Refined All Corridors and Corridor Concept Plus scenarios.

Table 3.7 Resource Conservation Performance Measures by Scenario

Scenario	Deviation from Base Scenario	
	Fuel Consumption	Emissions
Enhanced Future	-17.1%	-12.8%
SEMNPPTS Corridors	-15.3%	-15.5%
Refined All Corridors	-20.8%	-17.6%
Corridor Concept	-15.0%	-12.7%
Corridor Concept Plus	-20.8%	-16.1%

The individual subareas show substantial variations across the Corridor Concept Plus scenario (Table 3.8). The Apache Junction/Mesa, GRIC, and Queen Creek/Florence subareas all show large decreases in fuel consumption and emissions. Emissions reduction is consistent for these three subareas (at around 20 percent), but fuel consumption varies more significantly (from 22 percent for Apache Junction/Mesa to almost 32 percent for GRIC).

Table 3.8 Resource Conservation Performance Measures by Subarea
Corridor Concept Plus Scenario

Subarea	Deviation from Base	
	Fuel Consumption	Emissions
Apache Junction/Mesa	-22.3%	-21.1%
Chandler/Gilbert	-3.6%	-3.1%
Eloy/Coolidge	-4.3%	-9.1%
GRIC	-31.5%	-20.4%
Queen Creek/Florence	-27.3%	-20.5%

The proposed scenarios have relatively less impact in the Chandler/Gilbert or Eloy/Coolidge subareas. These areas show around a four-percent reduction in fuel consumption and between three and nine-percent reduction in emissions. These areas see less

benefit because of the location of the new facilities that are proposed as part of the Corridor Concept Plus scenario. The benefits that are exhibited suggest that individuals are altering their trip patterns to take advantage of the new facilities, creating benefits across the system.

Trends across the subareas for other scenarios are consistent with the results presented here. The Corridor Concept Plus scenario shows somewhat greater improvements in resource conservation than Corridor Concept scenario for all subareas (though generally not by a significant margin).

■ 3.5 Environmental Justice

Environmental justice (EJ) reflects a combination of resource conservation and accessibility concerns. A “concentration” of EJ populations is defined as census blocks that contain a percentage of EJ populations that is greater than the regional average. The intensity of these concentrations is measured by the relative variation from the regional average. Relative variation is measured using the concept of standard deviation, which captures how different a particular zone analyzed is from the average of all zones in the network. In this case, we are examining areas that have a greater concentration of a particular attribute (e.g., residents over the age of 65). In the results in the following figures, darker shading indicates a greater concentration of that group.

The analysis here goes as far as identifying the location of EJ population concentrations and their proximity to the proposed corridors and the locations in the network where congestion, pollution, and/or safety concerns are forecasted to occur. Population density was also taken into account in order to verify the extent of such impacts. Three key Environmental Justice populations are examined here:

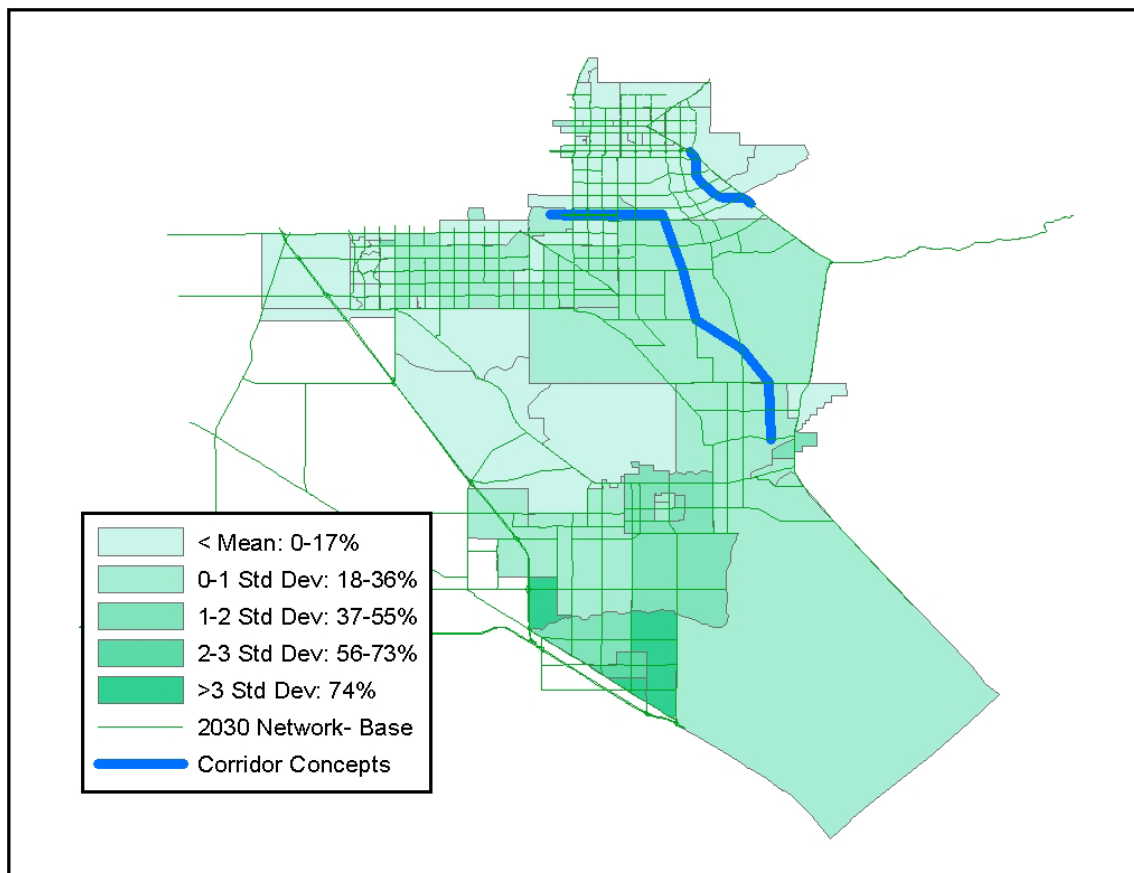
1. **Minority** populations are identified as populations that are of a race other than non-Hispanic white or are of multiple races.
2. **Impoverished** populations are determined by examining three measures: population living below the poverty line, households living below 50 percent of the poverty line, and households with zero vehicles.
3. **Elderly** populations are defined to include those people over the age of 65.

Minorities

The largest minority populations are found in the southern parts of the Eloy/Coolidge region (to the southeast of Casa Grande, as shown in Figure 3.4). By examining the subarea breakdown of other performance measures in this region, the impact on this population may be clarified.

With respect to mobility performance measures, this subarea has much lower total VMT and VHT due to lower total population. Despite this, all scenarios lead to improvements. In terms of resource conservation, the positive impact of proposed projects with respect to the base future scenario is less than in other regions (Apache Junction/Mesa, GRIC, and Queen Creek/Coolidge). This holds true across the scenarios.

Figure 3.4 Percent of Population Defined as Minority

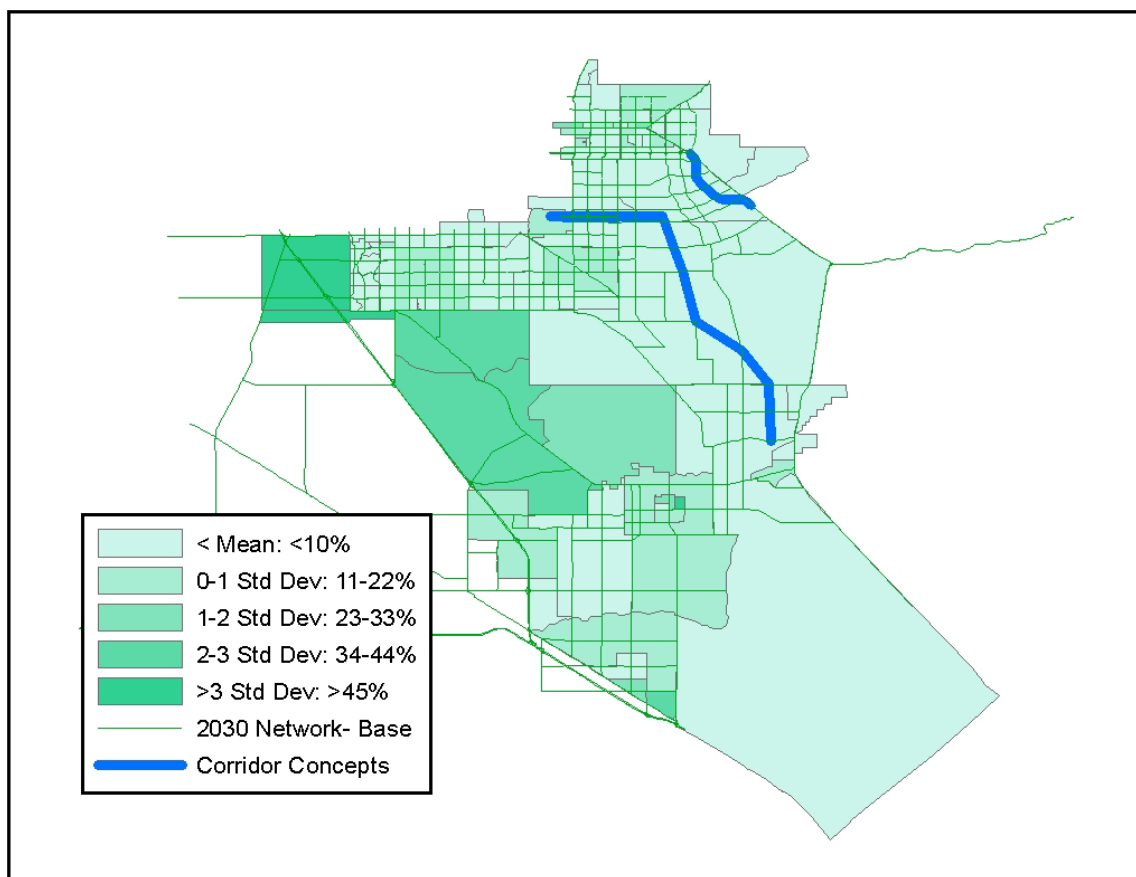


Poverty

The three gauges for poverty (households below the poverty line, people below 50 percent of the poverty line, and zero vehicle households) all indicated the same areas as relatively impoverished (see Appendix A for additional performance measure maps). The most significant of these encompasses virtually all of the GRIC subarea (Figure 3.5). The Eloy/Coolidge subarea also has higher rates of poverty than other regions in the study area.

The GRIC subarea shows relative improvements in all mobility performance measures on par with other subareas for each scenario. However, the limited roadway network in this area is the most congested in the Base Future and remains the most congested across all scenarios. The Refined All Corridors case provides the most improvement over the base case in mobility measures, but both the Corridor Concept and Corridor Concept Plus scenarios provide significant benefits as well. For safety, the enhanced Future and Corridor Concept Plus scenarios actually result in small increases in crash rate. The Refined All Corridors and Corridor Concept scenario both provide some improvement in crash rates. Fuel consumption and emissions rates show significant improvements in the GRIC subarea for every scenario.

Figure 3.5 Percent of Households Below the Poverty Line



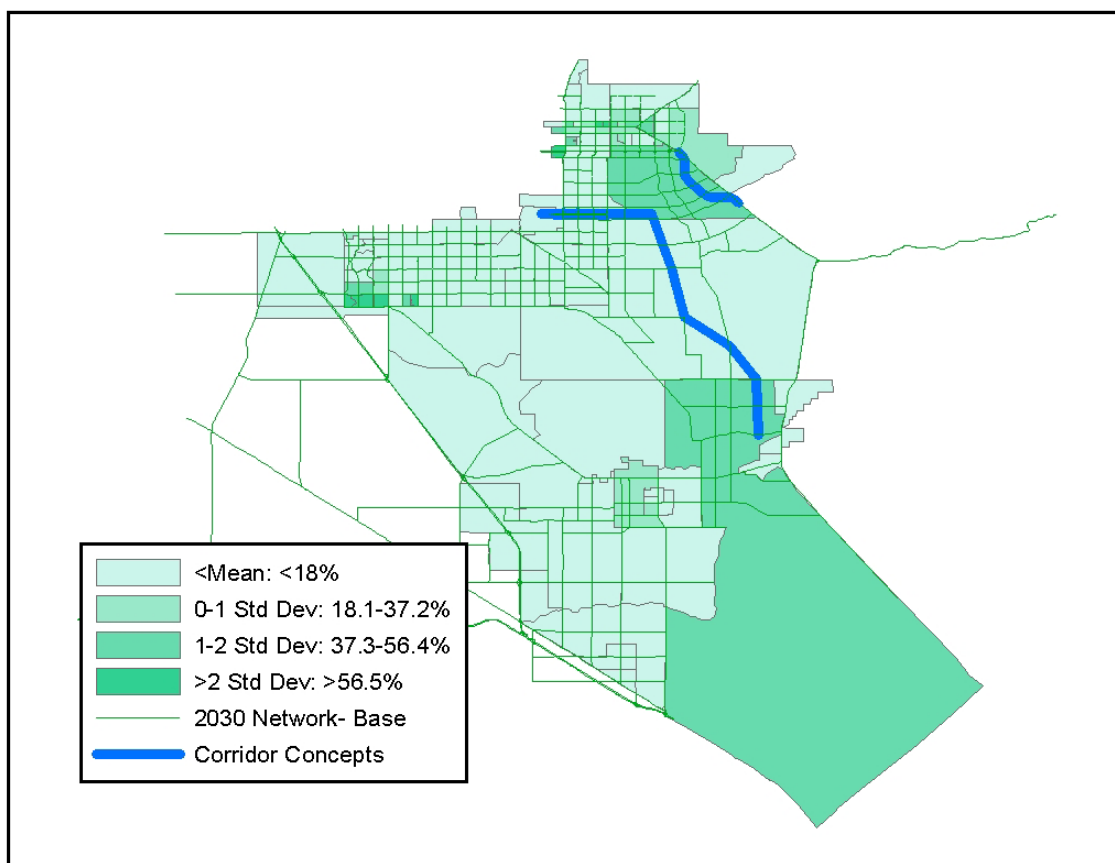
Age

The largest relative populations of elderly people can be found right in the U.S. 60 reroute corridor reaching west to the Williams Gateway Corridor. Figure 3.6 shows that this

population is most concentrated in the middle of proposed development and in the Apache Junction/Mesa subarea. There are a few other subareas with high relative elderly densities, but low population densities make them less significant.

Improvements to mobility performance measures are strong across all performance measures in this subarea. Those that involve development of the corridors provide the greatest impact. Crash rates follow a similar pattern to the systemwide result, except that the Corridor Concept and Corridor Concept Plus scenarios provide relatively safer roads. Improvements to fuel consumption and emissions in comparison to the Base Future scenario are among the best in all scenarios in the Apache Junction/Mesa subarea.

Figure 3.6 Percent of Population Over the Age of 65



Appendix A. Detailed Performance Tables

■ A.1 Mobility Tables

This section presents the detailed analysis of mobility.

Table A.1 Mobility Performance Measures by Scenario

	Total VHT	Total VMT	% Network V/C>1	% Network V/C>1.5
Base Future	4,551,023	32,113,122	41.0%	7.9%
Enhanced Future	3,261,492	31,619,784	32.2%	3.0%
SEMNPTS Corridors	2,682,051	32,973,195	26.1%	2.1%
Refined All Corridors	2,497,108	32,955,369	24.4%	1.7%
Corridor Concept	3,207,121	32,438,746	29.2%	3.5%
Corridor Concept Plus	2,994,424	32,252,439	27.9%	2.8%

Table A.2 Mobility Performance Measure Deviation from Base Case by Scenario

	Total VHT	Total VMT	% Network V/C>1	% Network V/C>1.5
Enhanced Future	-28.33%	-1.54%	-21.52%	-62.11%
SEMNPTS All Corridors	-41.07%	2.68%	-36.34%	-73.42%
Refined All Corridors	-45.13%	2.62%	-40.64%	-78.12%
Corridor Concept	-29.53%	1.01%	-28.72%	-55.86%
Corridor Concept Plus	-34.20%	0.43%	-32.07%	-64.49%

Table A.3 Mobility Performance Measures by Subregion and Scenario

		Total	VHT	Total	VMT	%	%
		VHT	Deviation	VMT	Deviation	Network	Network
			from Base		from Base	V/C>1	V/C>1.5
Apache Junction/ Mesa	Base Future	741,843		7,896,442		30.9%	2.8%
	Enhanced Future	463,605	-37.5%	7,921,698	0.3%	18.9%	1.0%
	SEMNPPTS Corridors	275,505	-62.9%	7,909,004	0.2%	7.3%	0.1%
	Refined All Corridors	268,888	-63.8%	7,761,615	-1.7%	5.9%	0.1%
	Corridor Concept	325,732	-56.1%	8,316,768	5.3%	9.0%	0.7%
	Corridor Concept Plus	308,496	-58.4%	8,252,473	4.5%	7.4%	0.2%
Chandler/ Gilbert	Base Future	895,672		6,273,553		71.8%	1.6%
	Enhanced Future	880,170	-1.7%	6,215,537	-0.9%	69.3%	1.6%
	SEMNPPTS Corridors	842,013	-6.0%	6,923,067	10.3%	61.7%	1.6%
	Refined All Corridors	880,335	-1.7%	6,803,304	8.4%	69.1%	1.6%
	Corridor Concept	939,969	4.9%	6,269,807	-0.1%	70.1%	1.6%
	Corridor Concept Plus	878,372	-1.9%	6,148,579	-2.0%	69.9%	1.4%
Eloy/ Coolidge	Base Future	218,030		6,042,944		7.6%	0.4%
	Enhanced Future	179,555	-17.6%	5,484,940	-9.2%	4.7%	0.4%
	SEMNPPTS Corridors	172,291	-21.0%	5,433,602	-10.1%	3.3%	0.3%
	Refined All Corridors	174,885	-19.8%	5,531,845	-8.5%	3.8%	0.3%
	Corridor Concept	185,226	-15.0%	5,513,505	-8.8%	4.4%	0.3%
	Corridor Concept Plus	170,819	-21.7%	5,405,756	-10.5%	2.8%	0.4%
GRIC	Base Future	1,120,126		5,298,075		68.2%	33.0%
	Enhanced Future	867,301	-22.6%	5,213,386	-1.6%	61.2%	15.2%
	SEMNPPTS Corridors	646,517	-42.3%	4,774,334	-9.9%	55.8%	9.5%
	Refined All Corridors	597,314	-46.7%	4,639,259	-12.4%	57.7%	9.2%
	Corridor Concept	852,112	-23.9%	4,903,650	-7.4%	59.5%	19.6%
	Corridor Concept Plus	790,131	-29.5%	5,055,372	-4.6%	64.9%	14.1%
Queen Creek/ Florence	Base Future	1,575,353		6,602,108		65.2%	20.1%
	Enhanced Future	870,860	-44.7%	6,784,222	2.8%	45.8%	5.3%
	SEMNPPTS Corridors	745,726	-52.7%	7,933,188	20.2%	42.3%	4.6%
	Refined All Corridors	575,685	-63.5%	8,219,346	24.5%	29.0%	2.9%
	Corridor Concept	904,082	-42.6%	7,435,015	12.6%	44.9%	6.3%
	Corridor Concept Plus	846,607	-46.3%	7,390,260	11.9%	40.8%	6.1%

■ A.2 Safety Tables

This section presents the detailed analysis of safety.

Table A.4 Safety Performance Measure Deviation from Base Future by Scenario

	Total Crashes
Enhanced Future	-0.73%
SEMNPTS Corridors	-10.86%
All Corridors	-8.92%
Corridor Concept	-6.55%
Corridor Concept Plus	-6.65%

Table A.5 Safety Performance Measure by Scenario
Incidents Per Million Vehicle Miles Traveled

	Fatalities	Injuries	PDO	Total Crashes
Base Future	0.483	46.202	66.498	113.182
Enhanced Future	0.480	45.813	66.068	112.362
SEMNPTS Corridors	0.437	41.380	59.074	100.891
Refined All Corridors	0.446	42.230	60.409	103.084
Corridor Concept	0.456	43.267	62.051	105.774
Corridor Concept Plus	0.456	43.214	61.987	105.656

Table A.6 Safety Performance Measure Deviation from Base by Subregion and Scenario

		Total Crashes
Apache Junction/Mesa	Enhanced Future	0.9%
	SEMNPPTS Corridors	-16.6%
	Refined All Corridors	-16.2%
	Corridor Concept	-9.7%
	Corridor Concept Plus	-10.4%
Chandler/ Gilbert	Enhanced Future	-0.9%
	SEMNPPTS Corridors	-0.7%
	Refined All Corridors	5.5%
	Corridor Concept	-0.1%
	Corridor Concept Plus	-2.0%
Eloy/ Coolidge	Enhanced Future	-11.7%
	SEMNPPTS Corridors	-16.1%
	Refined All Corridors	-9.3%
	Corridor Concept	-11.6%
	Corridor Concept Plus	-13.5%
GRIC	Enhanced Future	3.5%
	SEMNPPTS Corridors	-13.3%
	Refined All Corridors	-14.4%
	Corridor Concept	-7.9%
	Corridor Concept Plus	0.1%
Queen Creek/ Florence	Enhanced Future	2.8%
	SEMNPPTS Corridors	-10.1%
	Refined All Corridors	-12.2%
	Corridor Concept	-5.6%
	Corridor Concept Plus	-5.9%

■ A.3 Accessibility Figures and Tables

This section presents the detailed figures and tables for accessibility.

Table A.7 Percent of Trips to Activity Center by Time Band and Scenario

	Apache Junction			Chandler		
	0-15	15-30	30-45	0-15	15-30	30-45
Base Future	50.1%	30.2%	2.3%	58.3%	30.2%	4.0%
Enhanced Future	55.2%	27.4%	1.7%	63.0%	25.6%	4.6%
Refined All Corridors	77.9%	17.8%	2.4%	61.2%	27.8%	4.2%
Corridor Concept	73.6%	20.0%	1.7%	60.7%	27.9%	4.5%
Corridor Concept Plus	73.6%	20.0%	1.7%	60.7%	27.9%	4.5%
	Williams Gateway			Coolidge		
	0-15	15-30	0-15	15-30	0-15	15-30
Base Future	27.9%	9.7%	27.9%	9.7%	27.9%	9.7%
Enhanced Future	28.7%	24.3%	28.7%	24.3%	28.7%	24.3%
Refined All Corridors	47.1%	25.8%	47.1%	25.8%	47.1%	25.8%
Corridor Concept	30.3%	27.2%	30.3%	27.2%	30.3%	27.2%
Corridor Concept Plus	31.0%	32.2%	31.0%	32.2%	31.0%	32.2%

Figure A.1 Accessibility to Apache Junction Activity Center
Base Future Scenario

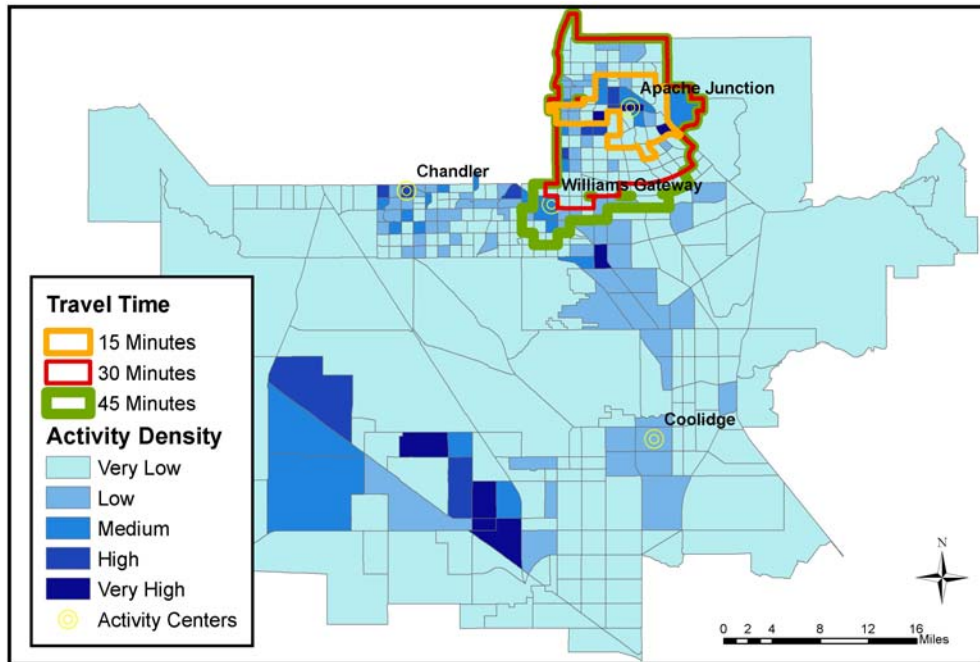


Figure A.2 Accessibility to Apache Junction Activity Center
Enhanced Future Scenario

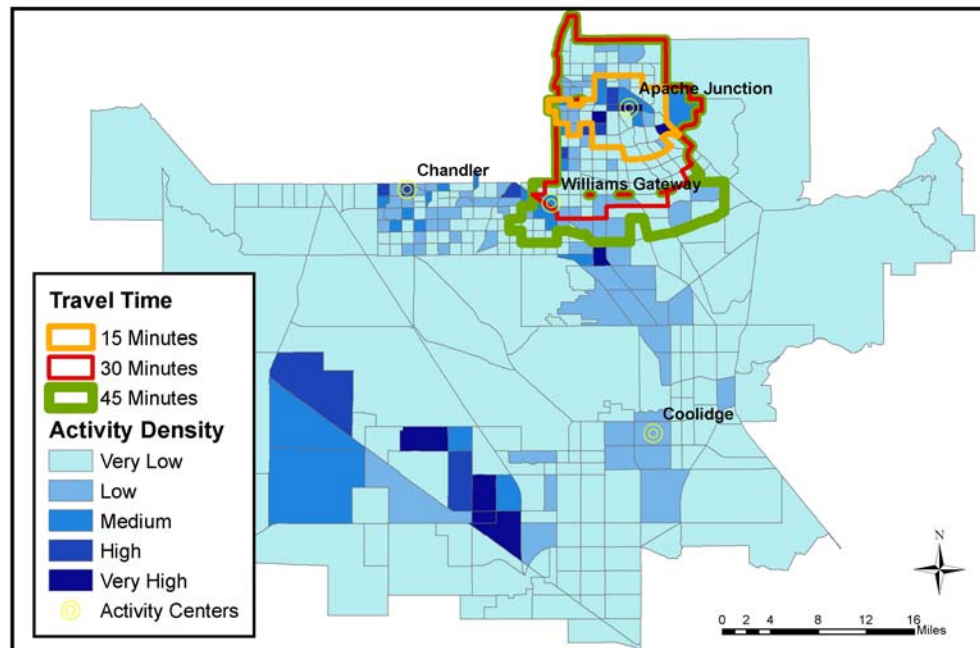


Figure A.3 Accessibility to Apache Junction Activity Center
Refined All Corridors Scenario

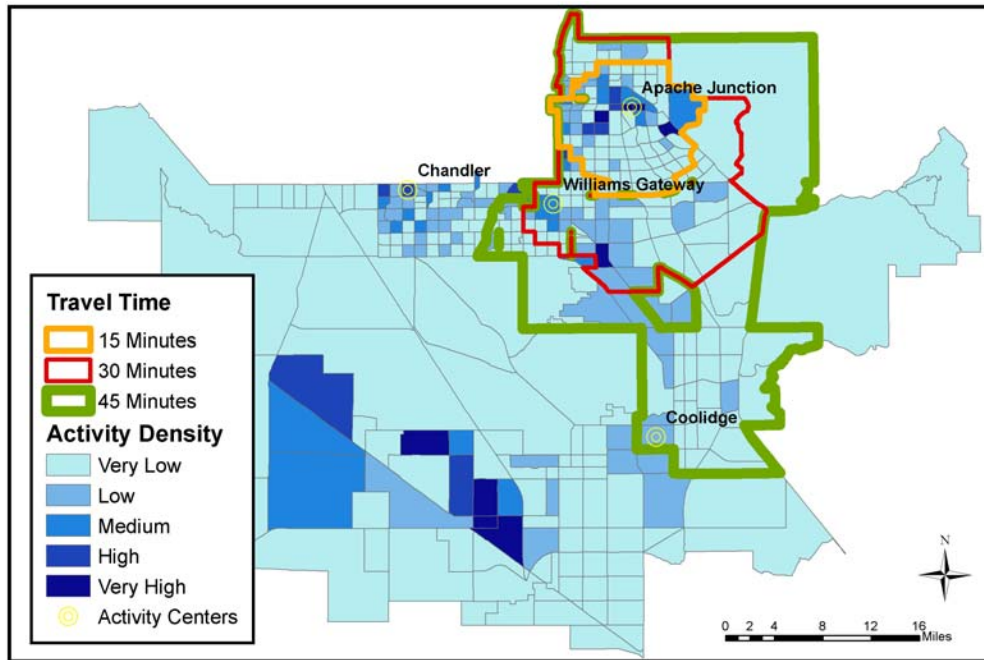


Figure A.4 Accessibility to Apache Junction Activity Center
Corridor Concept Scenario

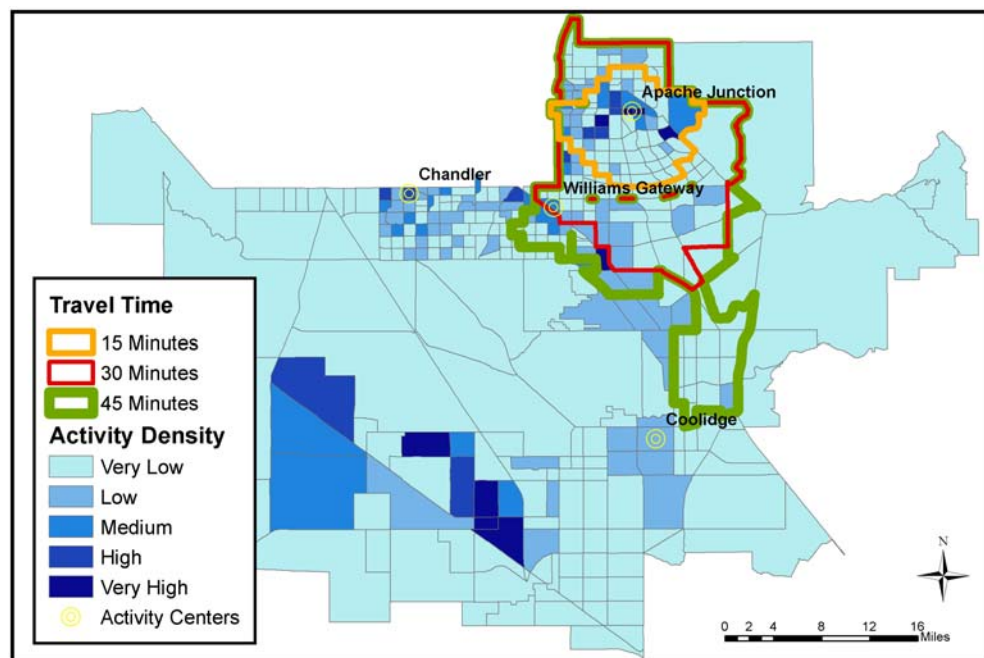


Figure A.5 Accessibility to Apache Junction Activity Center
Corridor Concept Plus Scenario

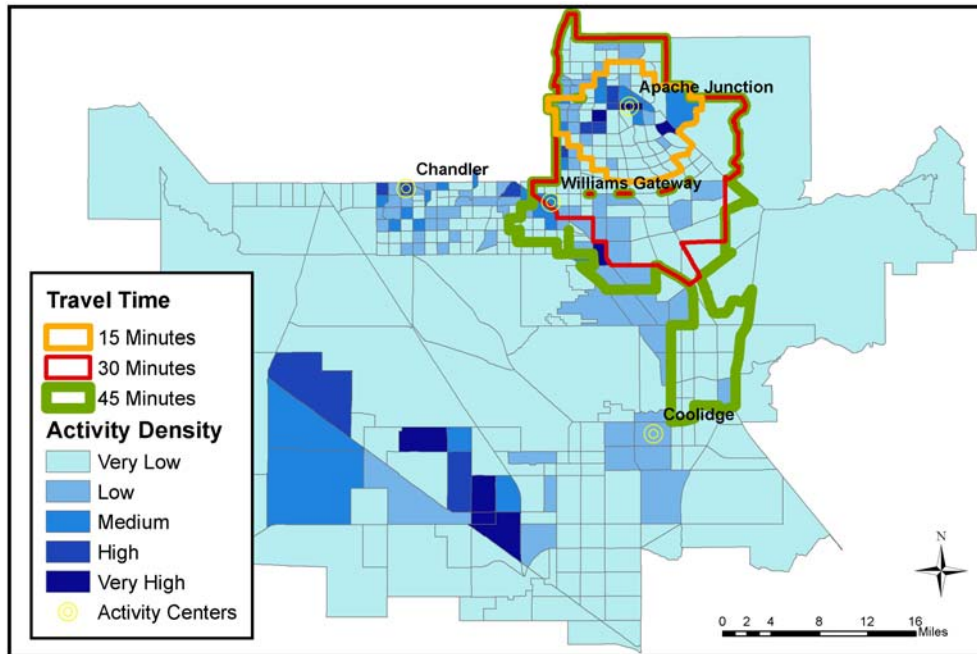


Figure A.6 Accessibility to Chandler Activity Center
Base Future Scenario

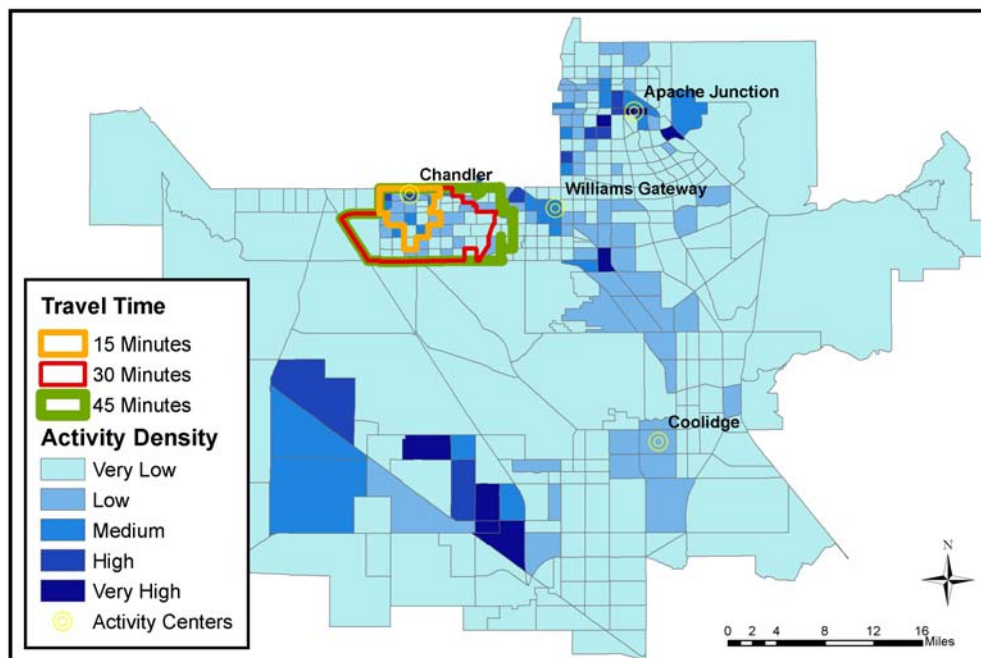


Figure A.7 Accessibility to Chandler Activity Center
Enhanced Future Scenario

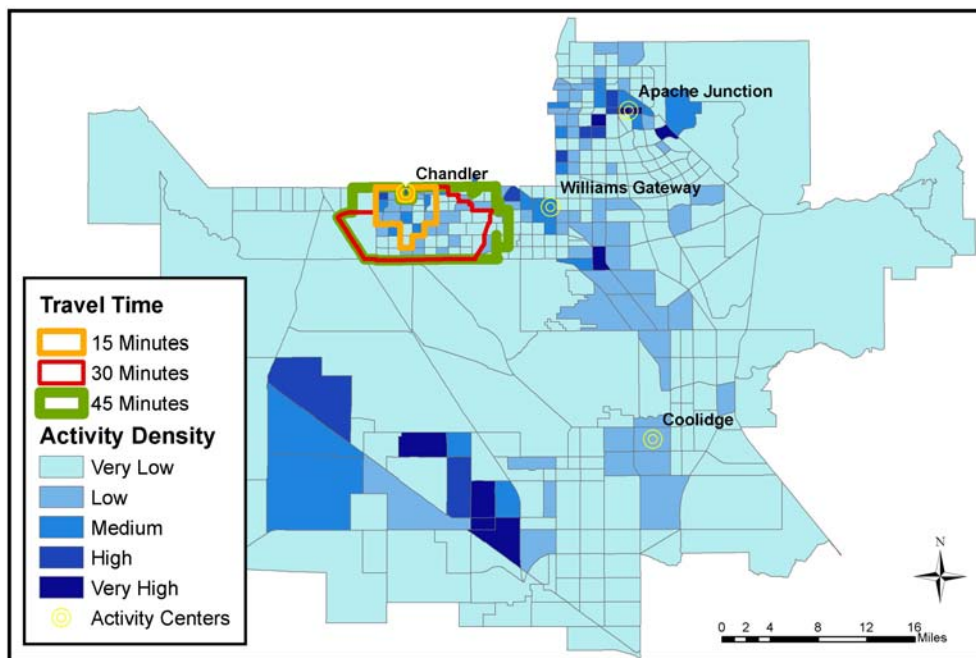


Figure A.8 Accessibility to Chandler Activity Center
All Corridors Scenario

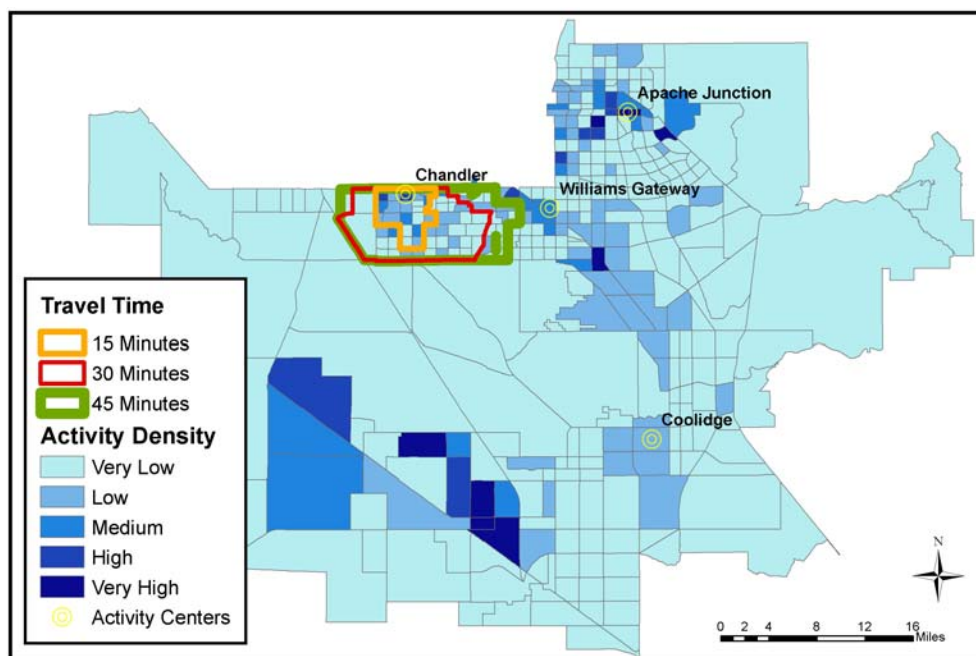


Figure A.9 Accessibility to Chandler Activity Center
Corridor Concept Scenario

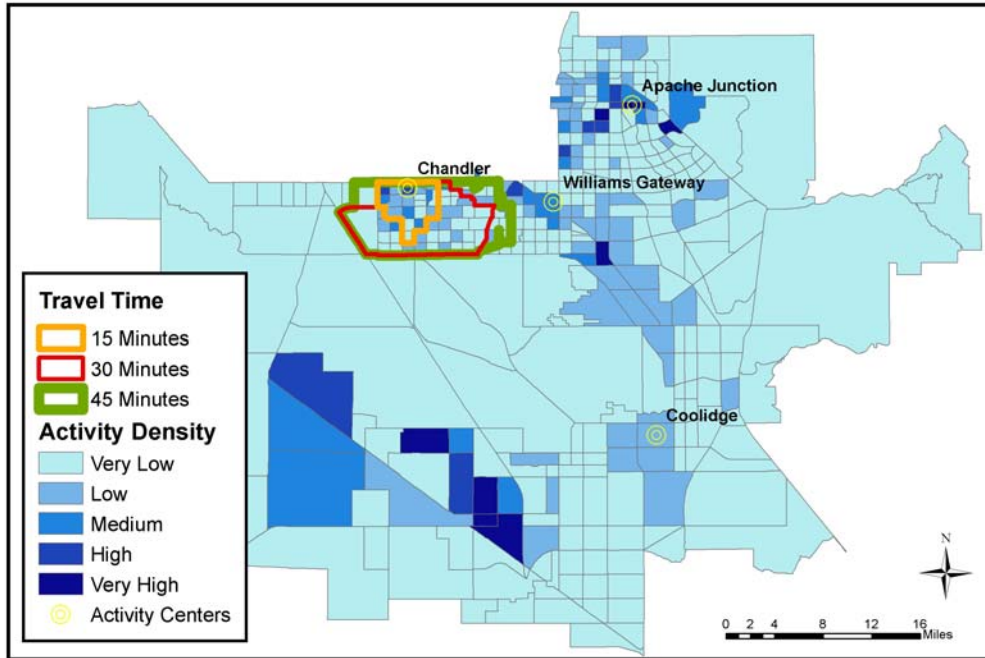


Figure A.10 Accessibility to Chandler Activity Center
Corridor Concept Plus Scenario

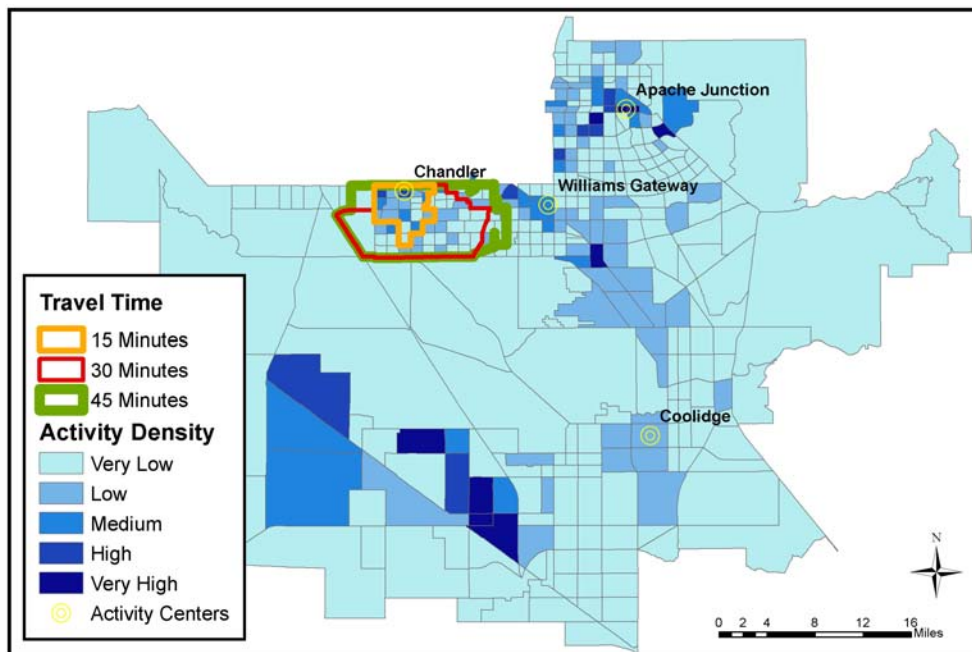


Figure A.11 Accessibility to Coolidge Activity Center
Base Future Scenario

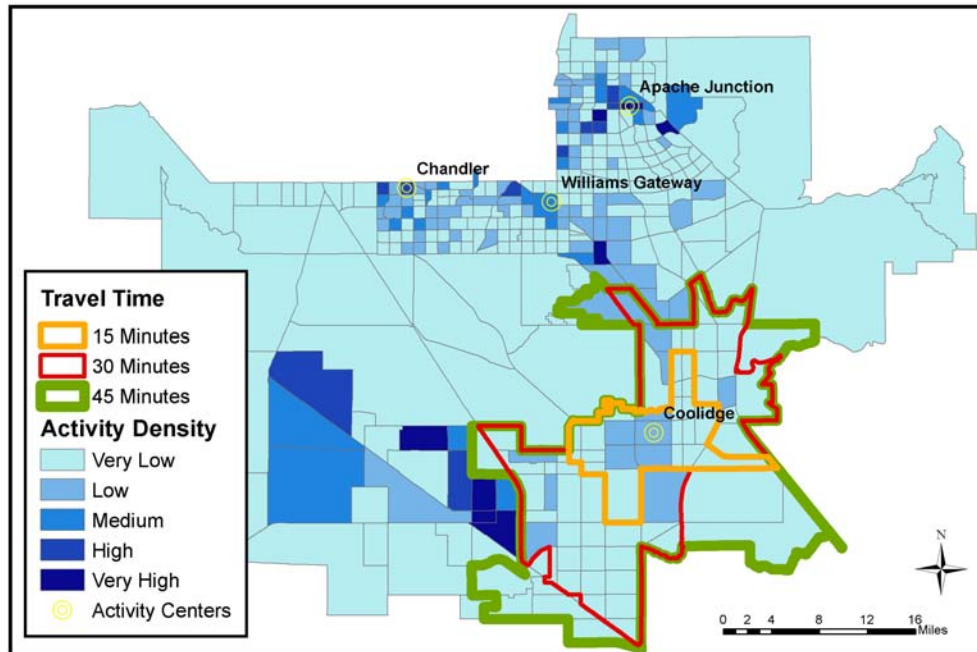


Figure A.12 Accessibility to Coolidge Activity Center
Enhanced Future Scenario

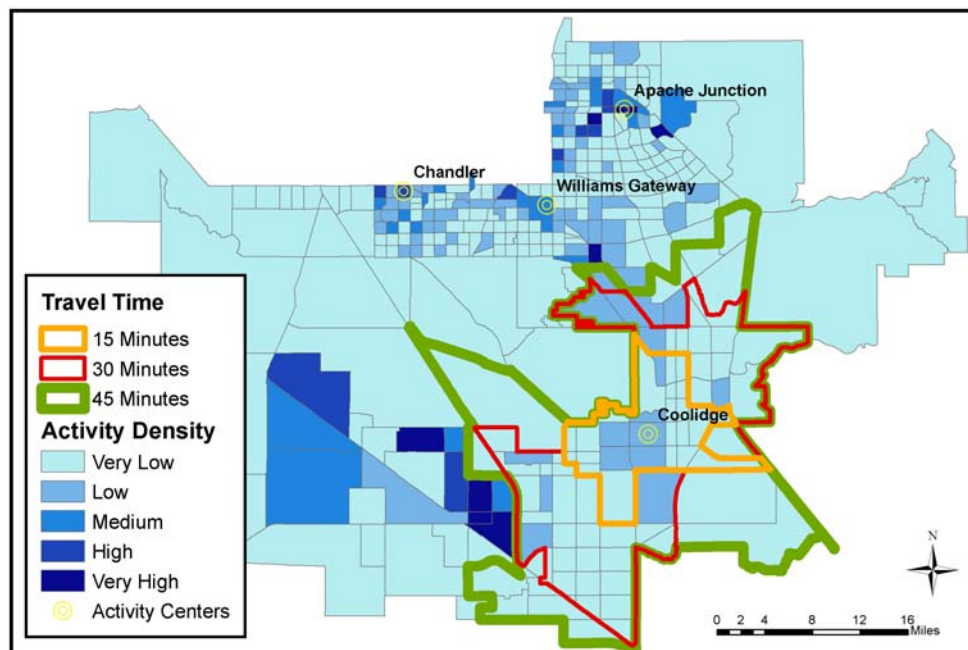


Figure A.13 Accessibility to Coolidge Activity Center
All Corridors Scenario

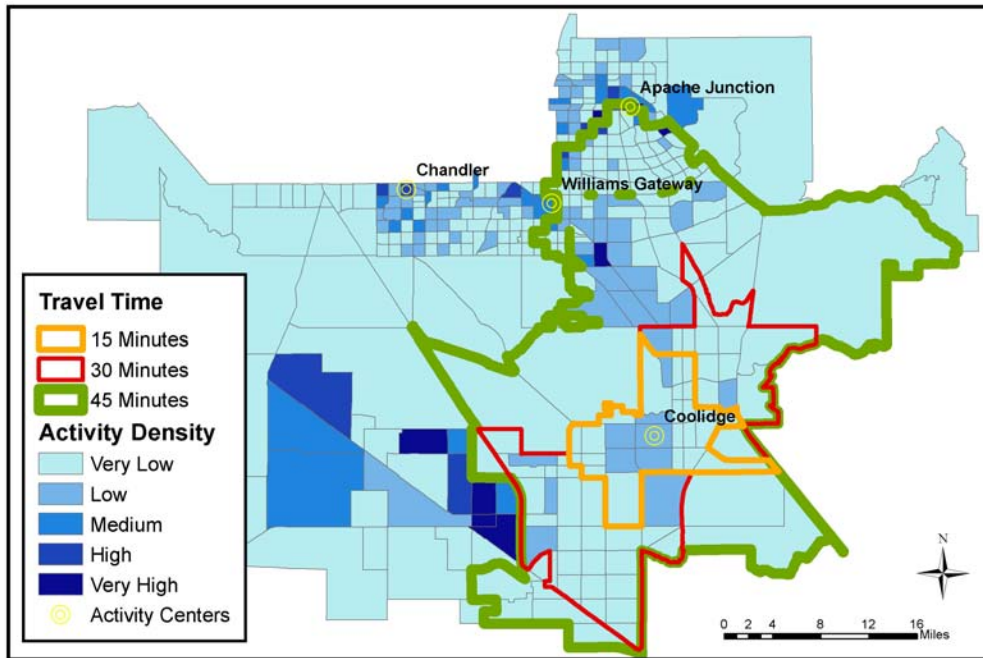


Figure A.14 Accessibility to Coolidge Activity Center
Corridor Concept Scenario

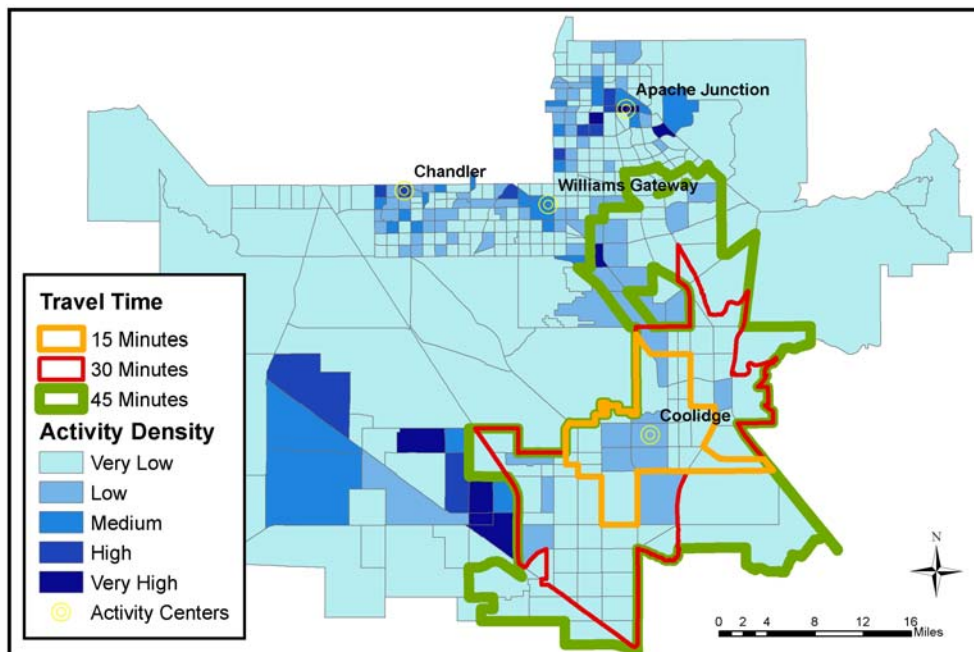


Figure A.15 Accessibility to Coolidge Activity Center
Corridor Concept Plus Scenario

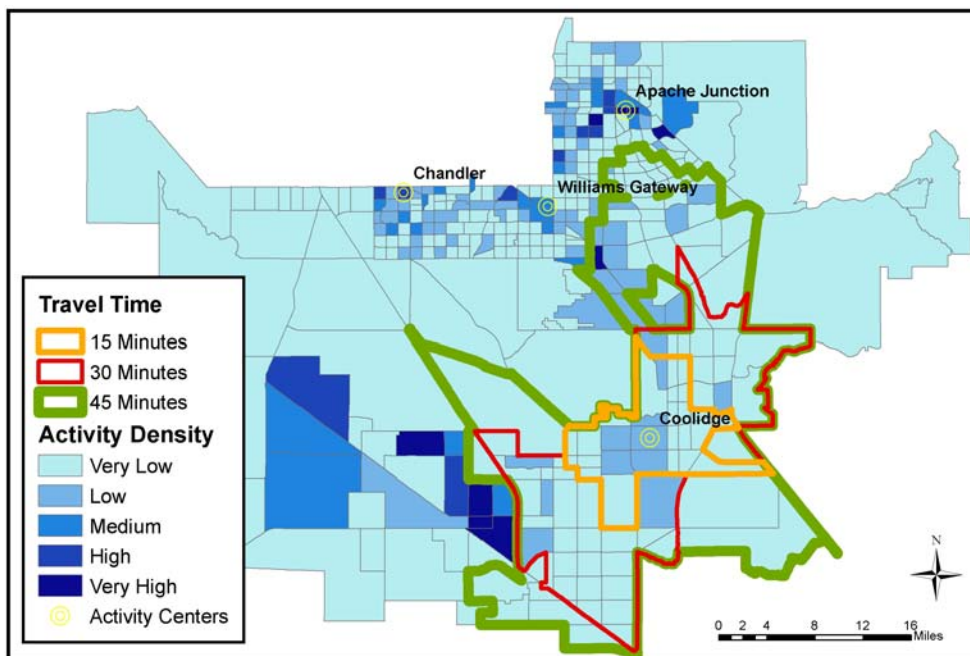


Figure A.6 Accessibility to Williams Gateway Activity Center
Base Future Scenario

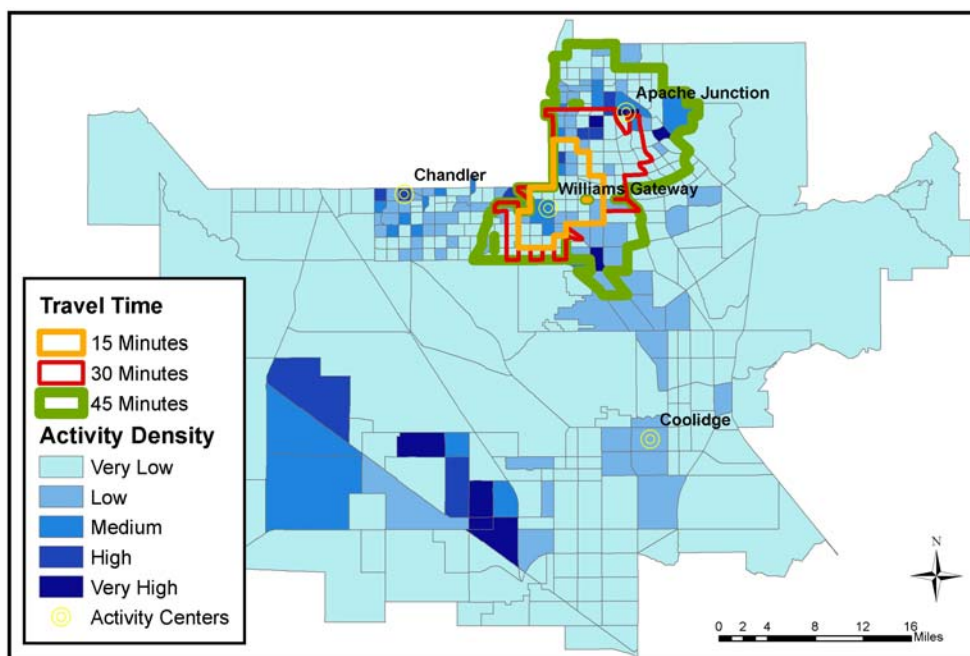


Figure A.7 Accessibility to Williams Gateway Activity Center
Enhanced Future Scenario

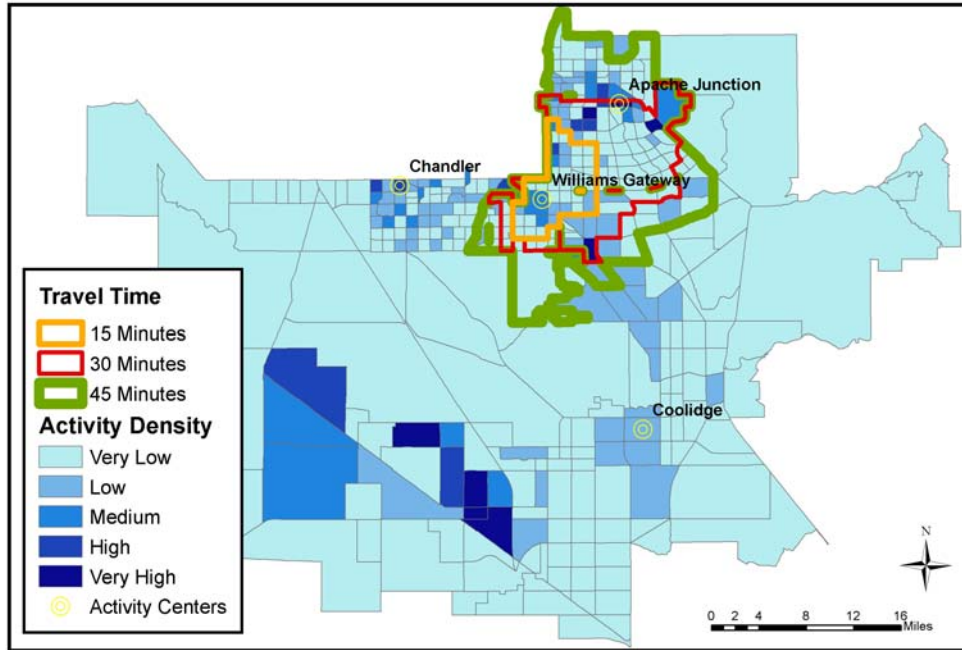


Figure A.8 Accessibility to Williams Gateway Activity Center
All Corridors Scenario

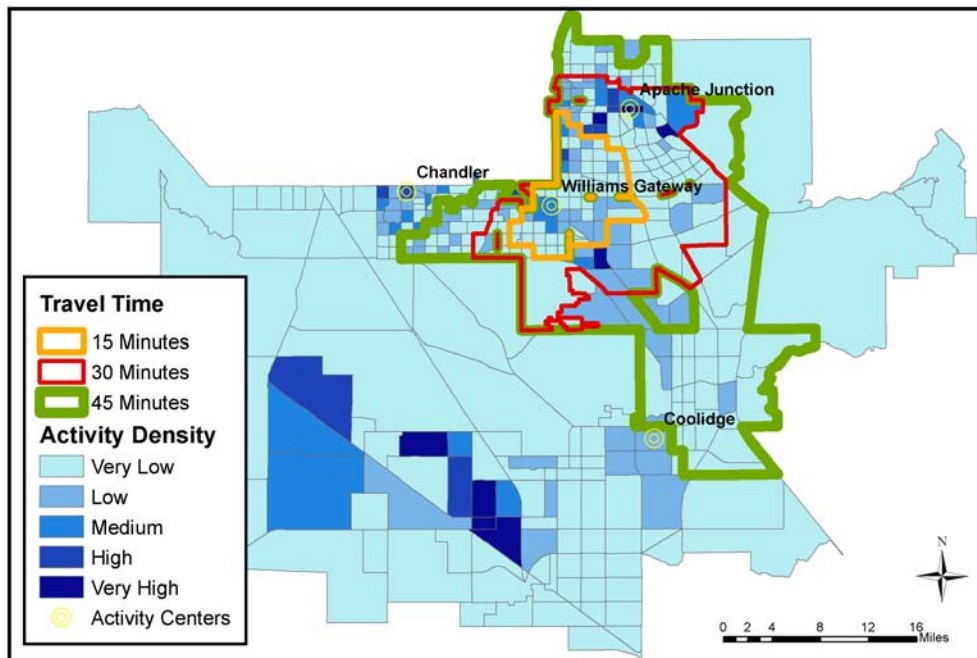


Figure A.9 Accessibility to Williams Gateway Activity Center
Corridor Concept Scenario

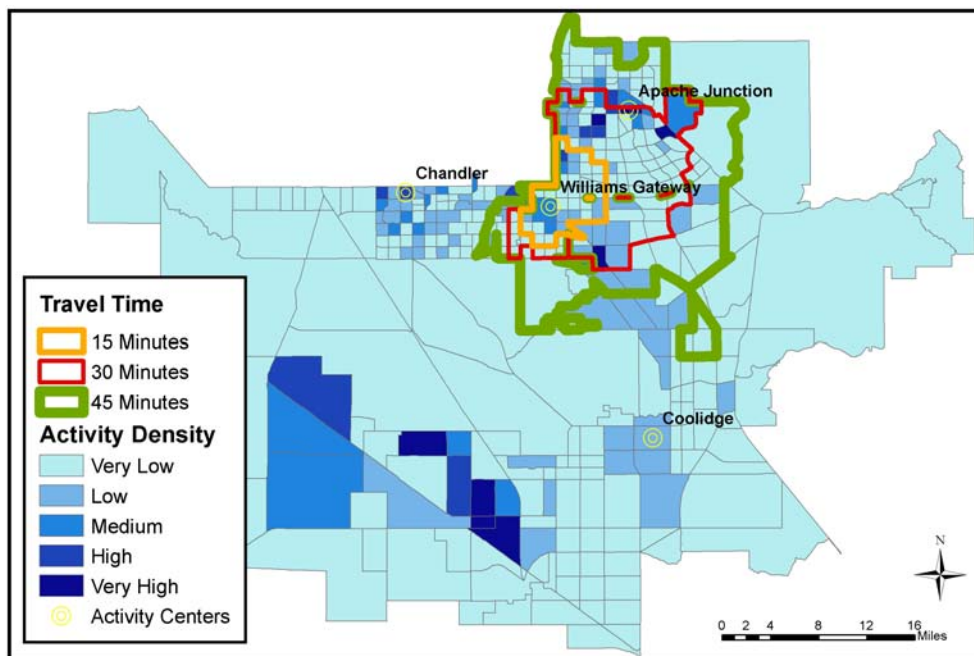
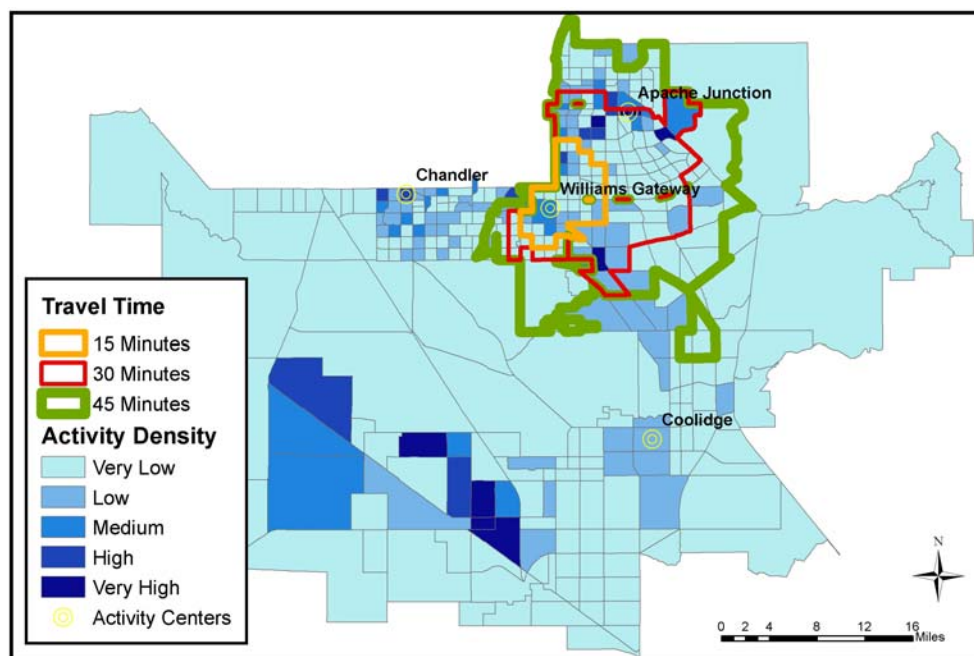


Figure A.10 Accessibility to Williams Gateway Activity Center
Corridor Concept Plus Scenario



■ A.4 Resource Conservation Tables

This section presents the detailed tables for resource conservation.

Table A.8 Resource Conservation Performance Measures
Deviation from Base by Scenario

	Fuel Consumption	Emissions
Enhanced Future	-17.1%	-12.8%
SEMNPPTS Corridors	-15.3%	-15.5%
Refined All Corridors	-20.8%	-17.6%
Corridor Concept	-15.0%	-12.7%
Corridor Concept Plus	-20.8%	-16.1%

Table A.9 Resource Conservation Performance Measures
Deviation from Base by Subregion and Scenario

		Fuel Consumption	Emissions
Apache Junction/Mesa	Enhanced Future	-17.9%	-15.5%
	SEMNPPTS Corridors	-24.7%	-24.8%
	Refined All Corridors	-27.9%	-27.0%
	Corridor Concept	-21.9%	-20.5%
	Corridor Concept Plus	-22.3%	-21.1%
Chandler/ Gilbert	Enhanced Future	-2.7%	-2.5%
	SEMNPPTS Corridors	10.9%	3.2%
	Refined All Corridors	2.2%	2.4%
	Corridor Concept	1.0%	0.5%
	Corridor Concept Plus	-3.6%	-3.1%
Eloy/ Coolidge	Enhanced Future	-5.0%	-8.5%
	SEMNPPTS Corridors	-3.9%	-9.2%
	Refined All Corridors	-2.5%	-6.9%
	Corridor Concept	-4.6%	-7.9%
	Corridor Concept Plus	-4.3%	-9.1%
GRIC	Enhanced Future	-16.8%	-9.0%
	SEMNPPTS Corridors	-29.3%	-23.2%
	Refined All Corridors	-32.6%	-25.1%
	Corridor Concept	-17.4%	-12.9%
	Corridor Concept Plus	-31.5%	-20.4%
Queen Creek/ Florence	Enhanced Future	-32.1%	-22.2%
	SEMNPPTS Corridors	-15.7	-17.1
	Refined All Corridors	-26.2%	-21.6%
	Corridor Concept	-22.8%	-17.3%
	Corridor Concept Plus	-27.3%	-20.5%