State Transportation System Mobility and Regional Circulation Needs Feasibility Study

Draft Final Report
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EXECUTIVE SUMMARY

The principal purpose of the PAG Loop Road Study is to evaluate the need for, and feasibility of, developing a system of high capacity, limited, controlled, and reduced access roadways in the PAG Region to meet travel demand beyond the current 2030 Regional Transportation Plan. The study recommendations will be used by PAG to meet the following regional transportation goals.

- Identification of transportation corridors beyond the 2030 horizon to meet future mobility and regional bypass needs in advance of land use development;
- Preservation of corridors and establishment of land use controls in the emerging and fringe areas of the region;
- Extension of the functional and operational life-cycle of existing arterials, collectors, and local streets in developed areas by diverting regional traffic to regional routes; and
- Identifying corridors in the 2030 Regional Transportation Plan that can be transitioned to higher capacity facilities in the future.

This study acknowledges the current long-range plans in the region, including the 2030 Regional Transportation Plan (RTP) and the Regional Transportation Authority projects that were approved by voters in 2006. Unlike the 2030 RTP and the RTA’s voter approved projects, both of which have specific time horizons; this study identifies corridors that will meet regional travel needs when the regional population is approximately 2.1 million persons.

These study results are to be used to provide general identification of future needs for right-of-way to preserve future transportation corridors.

Initially, a network of high capacity corridors (referred to as the Loop Road System) were identified and were refined based on input from PAG staff and a Technical Advisory Committee consisting of representatives from each of the PAG member-jurisdictions and other stakeholders. The loop routes were stratified into corridors, as shown in Figure S-1. Needs, performance, and feasibility of the general corridor alignments were addressed. As a result of the needs assessment, the following corridors demonstrated a need for a freeway facility:

- Western Freeway Loop
- Southern Freeway Loop

The following facilities demonstrated needs for parkway facilities:

- Houghton/Golf Links Parkway
- Kolb/Orange Grove Parkway
- River/Alvernon/Swan Parkway
- La Cholla Parkway
- Barraza- Aviation Parkway

These corridors, which were advanced to the feasibility analysis, are shown in Figure S-2. Needs were not demonstrated for either freeway or parkway facilities on the following loop system elements:

- Tangerine Road
- Houghton Road, north of Golf Links Road
- Ina Road
- Orange Grove Road, west of La Cholla Boulevard
- Snyder Road connection to Houghton Road.
These facilities could, however, be developed as restricted access arterials, although the traffic volume ranges do not justify higher facility classifications. It should be noted that Houghton Road, from I-10 to Tanque Verde, is planned to be widened to a 4 or 6-lane desert parkway, with bike lanes and sidewalks. This project was approved by voters in 2006 as part of the RTA Plan. This recommendation does not preclude the need for Houghton Road improvements because the Beyond 2030 analysis assumes other loop corridor facilities will be built, which may or may not occur. Similarly Tangerine Road, which is planned to be widened as a 4-lane desert parkway from I-10 to La Canada Drive in the RTA Plan, is needed but is not showing heavy future traffic volumes because of other assumed roadway facilities.

Corridor Feasibility Analysis

Three feasibility screens were performed for the freeway and parkway corridors: a physical constructability screen, an environmental screen, and a land use / area plan compatibility screen.

All of the corridors will have impacts that need to be investigated in greater detail in subsequent phases of project planning and preliminary design. On the corridors that traverse undeveloped areas, environmental impacts relating to wildlife, ranch lands, and critical habitats are key concerns. The western area in the Avra Valley has extensive Tucson Water recharge facilities and vacant parcels that are planned for future water resource development.

The location of the Central Arizona Project presents both a constraint and an opportunity to develop the Western Freeway Loop. A location near the CAP presents opportunities to locate the roadway near an area that has been cleared environmentally. However there are a number of major water lines that divert the CAP water to recharge areas and to the Tohono O’odham Nation for irrigation purposes that must be bridged or otherwise avoided.

In general, elements of area plans are consistent with the loop corridor system. Primary exceptions are that with respect to the Southern Freeway Loop, the Town of Sahuarita objected to the east-west roadway connection to I-19, using the El Toro Road location. The Town formally asked that PAG evaluate the feasibility of using a location near Pima Mine Road as an alternative to the El Toro location for the east-west connection to I-19. Three I-19 interchange alternatives were developed on or near the Pima Mine Road. While all of the alternatives were found to be possible from a design and construction perspective, no single alternative was endorsed by representatives of both the Town of Sahuarita and the San Xavier District. As a result, additional studies will be required to resolve issues associated with the recommendation for a 300-foot (right-of-way) corridor connecting I-19 to I-10 in the Southeast Area. Further, if it is decided by the State Transportation Board that a corridor connecting I-19 to I-10 in the Southeast Area should be developed as a state highway, additional studies will be required to evaluate alternative corridor alignments, and to identify and develop mitigation strategies for environmental impacts. If such a study is conducted, corridors along the El Toro and Pima Mine Road...
alignments should be considered and evaluated along with other corridor alternatives.

The proposed La Cholla Parkway corridor is not supported by Pima County Administration. The proposed alignment would impact the planned expansion of the Tortolita Mountain Park, as well as impact important cultural and biological resources. Pima County has made expansion of this park a priority through the 2004 General Obligation Bond Program, which allocates approximately $29 million of $174 million toward open space acquisition and/or conservation easements in the Tortolita Mountains area.

Concerns have been expressed by the Tohono O’odham Nation and the Pascua Yaqui Tribe regarding the proximity of the loop corridors to the Nation’s borders. Specifically, it was expressed that any future Los Reales alignment heading west through the San Xavier district would be seriously opposed by the District and the Tohono O’odham Nation, since it would split the San Xavier cooperative farms in half, and impact housing as well. In addition, the Pasqua Yaqui Nation should be consulted for input.

The Arizona State Land Department in general agrees with the loop concept but remains concerned about roadway impacts. They stated that conceptual plans adopted by the committee should be considered before future alignment recommendations are made, and that consideration should be given to multimodal corridors.

Project Cost Projections
The estimated implementation costs include $1.1 billion for right-of-way and $6.6 billion for construction.

Recommendations
The recommended Loop Study Corridors are conceptual in nature and will remain conceptual without implementation and involvement from PAG member jurisdictions, PAG, and the Regional Transportation Authority. This means that only a general alignment, capacity, and facility type have been considered so far. Some of the higher capacity, limited access roadways shown on the network may be candidates for state route or federal interstate highways and necessitate the involvement of the Arizona Department of Transportation and the Federal Highway Administration. A decision by the Arizona State Transportation Board as to the status of certain loop corridors as a state route or highway may affect the development and funding of the facilities. Key recommendations are:

1. Integration of Loop Corridors into the Regional Transportation Plan.

The Loop Study Corridors are candidate regionally significant routes and should be considered for inclusion in upcoming Regional Transportation Plans. The results of this study indicate the corridors are needed and are feasible, based on preliminary assessment. Initial planning of new facilities should involve location studies to define specifically the right-of-way width and location, legal description, impacts, and design for the routes. Other aspects of project development include planning to transition existing roadway facilities from facilities that have unconstrained access to adjacent property to facilities with a high level of access control that accommodate a higher number of through trips.

2. Once Loop Study Corridors are included in the Regional Transportation Plan, incorporate Corridors into a Major Streets and Routes Plan.

A primary tool for corridor preservation is a Major Streets and Routes Plan (MSR). Pima County and the City of Tucson have already adopted MSR which are updated periodically. The City of Tucson routinely follows the intent of the Pima County MSR as they annex unincorporated areas. The Town of Marana has a Major Route Right of Way Plan. Corridors that follow a section line can be added into existing transportation plans of the local jurisdictions or adopted formally, and placed on an existing MSR plan.

3. As the MSR Plan is Prepared, Integrate with Adopted Land Use Plans

It is recommended that the corridor recommendations of this study be further integrated into the local jurisdiction’s overriding plans and programs. This will require the jurisdictions to formally amend their land use and circulation elements; to update any affected area and neighborhood plans; to potentially modify their zoning codes and development procedures; and to incorporate the corridors into their capital improvement programs.

4. Consider Development of a Dedicated Funding Source for Future Funding of Loop Study Corridors

Future roadway improvements for the “beyond 2030” scenario will require new revenue sources dedicated to their implementation. None of the corridor costs are included in currently-adopted plans, and therefore no money is earmarked for these new corridors. Potential funding options fall into three general categories, public, private, and public/private partnerships. In Arizona, federal and state funds
have been the primary revenue source for most major roadway projects. Some local revenues have also been used.

5. Funding Strategies

Funding sources with the highest potential are likely to be toll roads; regional impact fees; state or federal funding via route transfer; and commitment of a second 20-year RTA ½ cent sales tax towards these corridors. This short list is not mutually exclusive, meaning that one or all of the sources could be used strategically.

6. Implementation Strategies

Implementing any or all of the these corridors requires an extremely long lead time, perhaps as long as 30 - 50 years to plan, fund, design and build. However, that does not mean work on the projects can wait. Instead, if the corridors are approved for implementation, work will need to begin immediately on the initial project phases.

An initial step includes identifying an appropriate steward for implementing this interconnected Loop system. There are three obvious choices to consider: PAG, the RTA, and ADOT (for Loop System corridors designated as future state highways). A fourth choice would be a new entity, perhaps a separate district created by state statute.

The second strategy is instituting a project programming continuum that links all of the phases of corridor development from concept to construction. This project programming continuum should include development of design standards for each corridor, to assist in obtaining concurrence and public review.

7. Prioritize the Acquisition of Right-of-Way for the Recommended Improvements

Prioritizing the acquisition of right-of-way for the recommended improvements would help preserve the routes, minimize the cost of developing the roadways, and help control access to the roadways.

8. Develop Regional and Jurisdictional Development Policies for Limiting Access from Developments that are Built before the Limited Access Roadway can be Completed

It is recommended that regional and jurisdictional development policies be implemented in order to limit access to future planned limited access facilities. The City of Tucson has developed some policies for roadways such as Houghton Road, where development is currently taking place before a planned limited access roadway can be constructed. These policies allow the developments to access the roadway during the interim period, but require the future access to the development to conform to the access restrictions required for a limited access roadway in the future. These types of development policies will be essential to successful implementation of these limited access roadways.
1. Introduction

This report summarizes the results of a regional transportation planning effort to develop and assess the need for future high capacity transportation corridors, beyond what is planned in the current 2030 Regional Transportation Plan or the Regional Transportation Authority’s list of voter-approved projects. This study extends the planning horizon beyond the year 2030 to a future time when the total population of the PAG Region will be 2.1 million persons. This very long range forecast was needed in order to identify and protect the corridors and right-of-way that will be needed to serve our future population.

Initially, a network of high capacity corridors (referred to as the Loop Road System) were identified based on input from PAG staff and a Technical Advisory Committee consisting of representatives from each of the PAG member-jurisdictions and other stakeholders, including:

- City of Tucson
- Pima County
- Town of Marana
- Town of Oro Valley
- Town of Sahuarita
- City of South Tucson
- San Xavier District of Tohono O’odham Nation
- Pascua Yaqui Tribe
- Arizona State Land Department
- Tucson Airport Authority
- ADOT Planning Division
- ADOT Tucson District

Needs, performance, and feasibility of the corridors were addressed. Corridor needs were evaluated using a travel demand assessment for a future regional population of 2.1 million persons. Corridor performance was assessed by evaluating mobility measures. The study analyzed the potential for the corridors to serve freight movements. Corridor feasibility was evaluated using engineering, environmental, and area plan compatibility screens. This final report provides preliminary cost information and recommendations for the future development process for the corridors. It is important to note that the corridors are general in nature and not specific roadway alignments. Further studies will therefore be needed to define roadway alignments, design features, and environmental impacts for each corridor. A fundamental goal of the study is to determine general facility location and right–of-way width required to carry future volumes, using today’s volume to capacity relationships.

Another aspect of this study was to provide information on the criteria and process to designate a route as a State Highway and to assess whether selected special focus corridors are important from a state highway perspective. The special focus corridors, selected by PAG, are:

1. Tangerine Road, I-10 to SR 77 (either connecting directly to I-10 or with an alternative connection to I-10 via Camino De Manaña).
2. Sahuarita Corridor, consisting of a new limited access facility on the El Toro Road alignment, turning north to a Wilmot Road/Kolb Road alignment, which extends north to the I-10/Kolb Road interchange. This alignment includes an east-west extension along Andrada Road from Wilmot Road to I-10 in the vicinity of SR 83. The definition of this corridor is consistent with the draft recommendations of the PAG Southeast Area Arterial Study. The Sahuarita Mayor and Council have requested that the El Toro Road alignment for this corridor be studied in greater detail and that alternatives to the El Toro Road alignment be considered.
3. Loop Corridor consisting of Houghton Road, Golf Links Road, Alvernon Way, and Swan Road. (The Sahuarita Corridor “closes” this loop).
4. Barraza-Aviation Parkway Extension (Golf Links Road to I-10/Valencia Road)

The assessment of the listed focus corridors, which is a separate aspect of the study, is provided in Appendix A.
Three working papers were developed to document the work efforts of this study.

- Working Paper 1 – Data Collection and Existing Conditions, August 2005
- Working Paper 2 – Assessment of Selected Loop Routes for Designation as State Highways, March 2006

1.1 Study Purpose – Planning Beyond the 2030 Horizon

The principal purpose of the PAG Loop Road Study is to evaluate the need for, and feasibility of, a system of high capacity, limited, controlled, and reduced access roadways in the PAG Region to meet travel demand beyond the current 2030 Regional Transportation Plan. The study had the following regional transportation goals.

- Identification of transportation corridors beyond the 2030 horizon to meet future mobility and regional bypass needs in advance of land use development;
- Preservation of corridors and establishment of land use controls in the emerging and fringe areas of the region;
- Extension of the functional and operational life-cycle of existing arterials, collectors, and local streets in developed areas by providing opportunities for diverting regional traffic to regional routes.
- Identifying corridors in the 2030 Regional Transportation Plan that can be transitioned to higher capacity facilities in the future.

1.2 2030 Regional Transportation Plan

The 2030 Regional Transportation Plan (adopted June 2005) (RTP) addresses transportation facilities and services in eastern Pima County, which includes unincorporated Pima County, the City of Tucson, the City of South Tucson, the Town of Marana, the Town of Oro Valley, the Town of Sahuarita, the Pasqua Yaqui Tribe and the San Xavier District of the Tohono O’odham Nation. The roadway element of the RTP is shown in Figure 1-1. As will be described later in the document, several corridors in the loop system are included in the Regional Transportation Plan.
Figure 1-1
2030 Regional Transportation Plan
Roadway Elements
1.3 Corridors Evaluated in the Beyond 2030 Planning Horizon

Figure 1-2 shows the original Loop System corridors that were identified at the inception of the project. Based on input from the Technical Advisory Committee, and member agencies, the corridors were revised in the following ways:

- Assume Southeast Area Plan recommendations
- Add Valencia Road, east of I-10 to Houghton Road
- Add Tanque Verde Road connection
- Consider options for connecting Kolb Road to Sunrise Drive
- Add River Road corridor termination at the I-10 / Sunset TI
- Add La Cholla Boulevard connection to I-10, via Ruthrauff Road
- Add Barraza Parkway extension to the I-10 / Valencia TI

Figure 1-3 shows the changes that were made to the original Loop System corridors based on the above input. Subsequent work involved structuring these routes into named corridors. Figure 1-4 shows the corridors that were initially analyzed. Many of these corridors were originally identified within the 1986 PAG Regional Transportation Plan. The ten (10) corridors that were evaluated individually or as components of a larger system, encompass approximately 215 miles of roadway, and include existing urban and rural arterial facilities. The corridors also include both expansions of existing facilities, as well as new facilities on new right-of-way. These ten (10) corridors, which were evaluated individually or as a component of a larger system, are described below:

- **Houghton/Golf Links/Swan Loop.** This corridor provides connectivity between I-10, the preferred alignment for Sahuarita Corridor as identified in the Southeast Area Arterial Study, Houghton Road, and the existing Golf Links Road. This corridor also provides a connection to the existing Barraza Aviation Highway.

- **Southwest Outer Loop.** This corridor links I-10 in northern Marana with I-10 near the community of Vail via Sandario Road and the eventual Sahuarita Corridor alignment as identified in the Southeast Area Arterial Study.

- **Southwest Inner Loop.** This corridor links I-10 in northern Marana with Houghton Road via Valencia Road.

- **River/Alvernon Corridor.** This corridor links I-10 at the Orange Grove/River Road interchange with the eventual alignment for the Sahuarita Corridor identified in the Southeast Area Arterial Study via River Road, Alvernon Road, and Swan Road.

- **Kolb/Northern I-10 Loop.** This corridor links I-10 in northern City of Tucson with the eventual Sahuarita Corridor alignment via Kolb Road. Possible locations for the connection to I-10 include the Ina Road, Orange Grove Road, Grant Road interchanges.

- **Houghton/Sunrise Corridor.** This corridor links I-10 in northern City of Tucson with the eventual Sahuarita Corridor alignment as identified in the Southeast Area Arterial Study via Sunrise Road and Houghton Road. Possible locations for an I-10 connection include the Ina Road and Orange Grove Road interchanges.

- **Oracle Junction/La Cholla Corridor.** This corridor connects SR-77 near the Oracle Junction to I-10 in the City of Tucson via the La Cholla Boulevard alignment. Possible locations for an I-10 connection include the Ruthrauff Road interchange or a new interchange between Ruthrauff Road and Prince Road. The La Cholla segment was part of previous Regional Transportation Plans; the extension from Tangerine Road to Oracle Road was originally conceived by Oro Valley.
- **Barraza Aviation Corridor.** This corridor connects I-10 at the Valencia Road interchange with I-10 in downtown Tucson via the Barraza Aviation Parkway alignment. The proposed corridor would utilize the I-10 interchange at Congress Street.

- **Tangerine/Valencia Loop.** This corridor connects Oracle Road (SR-77) with Northern I-10, I-19, and Southern I-10 via Tangerine Road and Valencia Road. Possible connections to I-10 in the Town of Marana include the existing Tangerine Road interchange and the future Twin Peaks Road interchange while the existing Valencia Road interchange will provide connection to I-19. The termination of this corridor may be either at the new Alvernon/Swan Road alignment, I-10, or Houghton Road.

- **Tanque Verde Corridor.** This corridor provides connections via the existing Tanque Verde Road alignment. While the range of connection depends on the need for other corridors, the Tanque Verde Corridor could ultimately connect I-10 at the Grant Road interchange with Kolb Road and/or Houghton Road.
Figure 1-2
Original Corridors To Be Studied
Figure 1-3
Modified or Revised Study Corridors

Legend
- additions to the Loop Corridor System
X deletions to the Loop Corridor System
Figure 1-4
Loop System
Candidate Corridor Evaluation Segments
1.4 Roadway Facility Types Evaluated for Loop Routes

While the loop system will need to provide improved regional connectivity, not all corridors will require the same amount of access restriction, number of lanes, speed limits, and intersection types. In an effort to distinguish future corridor infrastructure, three distinct facility types were identified – limited access control, restricted access control, and full access control facilities. These facility types were evaluated during corridor modeling and are described below.

Limited access control facilities are urban multi-lane arterial streets with access limitations intended to increase capacity and travel speeds. Access management strategies that might be implemented to accomplish this include: continuous median barriers, prohibition of left-turn movements, Florida-tee intersections (left turns are prohibited and drivers make a right turn, followed by a u-turn to turn left), driveway consolidation, and possibly frontage roads. Intelligent transportation system technologies include adaptive signal timing and dynamic message signs. Access to individual businesses and residences will be avoided to the extent possible. Six (6) lanes, three in each direction, will be considered the minimum number of lanes for these roadways and typical right-of-way requirements will be 150 feet. An example of a limited access controlled arterial is Kolb Road, in the vicinity of Davis Monthan Air Force Base.

Restricted access control facilities are urban or suburban multi-lane parkways with a combination of at-grade intersections, grade-separated intersections, and interchanges. The RTA also defines a “desert parkway” category that is more environmentally sensitive, and which is also a consideration in this study. Should interchanges be used on these facilities, they would typically be Single Point Urban Interchanges (SPUIs), which are interchanges designed similar to a diamond interchange, but with all ramps controlled by a single signalized intersection. Opposing travel directions will be physically separated by either a barrier or a median. Six (6) lanes, three in each direction, is the typical number of lanes for these roadways and right-of-way requirements are anticipated to vary between 150 and 300 feet. An example of a suburban parkway facility is Skyline Drive, between Orange Grove Road and immediately east of Campbell Avenue, shown above.

Full access control facilities are multi-lane freeways where access is allowed only via ramps at traffic interchanges. Opposing travel directions will be physically separated by either a barrier or a median. Four (4) lanes, two in each direction, will be considered the minimum number of lanes for these roadways and typical right-of-way requirements will be 300 feet.

A summary of the three facility types are provided in Table 1-1.
Table 1-1 – Roadway Facility Types

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Limited Access Control</th>
<th>Restricted Access Control</th>
<th>Full Access Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Classification</td>
<td>Arterial with Access Control</td>
<td>Parkway</td>
<td>Freeway</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>Local, Regional</td>
<td>Regional, State</td>
<td>State</td>
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<tr>
<td>Design Standard</td>
<td>Local</td>
<td>Local, ADOT</td>
<td>ADOT</td>
</tr>
<tr>
<td>Area Classification</td>
<td>Urban</td>
<td>Urban, Suburban</td>
<td>Urban, Suburban, Rural</td>
</tr>
<tr>
<td>Posted Speed Limit</td>
<td>35-45 mph</td>
<td>40-45 mph</td>
<td>55-75 mph</td>
</tr>
<tr>
<td>Typical Right-of-Way Needs</td>
<td>150 feet</td>
<td>150 - 300 feet</td>
<td>300 feet</td>
</tr>
<tr>
<td>Typical Number of Lanes</td>
<td>6</td>
<td>6</td>
<td>4-8</td>
</tr>
<tr>
<td>Typical Traffic Control</td>
<td>Signalized, two-way stop</td>
<td>Signalized, two-way stop</td>
<td>Controlled access interchanges</td>
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<tr>
<td>Interchange Type</td>
<td>N/A</td>
<td>SPUI*, tight diamond</td>
<td>SPUI*, tight diamond</td>
</tr>
<tr>
<td>Interchange Spacing</td>
<td>N/A</td>
<td>1 mile minimum for interchanges</td>
<td>1-mile minimum, 2-mile preferred</td>
</tr>
<tr>
<td>Frontage Roads</td>
<td>Possible</td>
<td>Possible, but not desirable with SPUIs*</td>
<td>Possible, but not desirable with SPUIs*</td>
</tr>
<tr>
<td>Minor Street Intersections</td>
<td>Yes, with turning restrictions</td>
<td>Possible, with turning restrictions</td>
<td>No</td>
</tr>
<tr>
<td>Driveways</td>
<td>Consolidated with turning restrictions</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Bus Stops</td>
<td>Yes, with pullouts</td>
<td>Possible, with pullouts</td>
<td>No</td>
</tr>
<tr>
<td>Bicycle Facilities</td>
<td>Yes</td>
<td>Possible</td>
<td>No</td>
</tr>
<tr>
<td>Pedestrian Facilities</td>
<td>Possible</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Future Improvements</td>
<td>N/A</td>
<td>Full Access Control</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*SPUI = Single Point Urban Interchange
2. **EXISTING CONDITIONS**

This chapter provides a brief overview of existing traffic and roadway features for the candidate corridors evaluated in the study.

2.1 *Roadway Inventory of Existing Features and Conditions*

Existing roadways identified as potential candidate corridors for the Loop Study were inventoried to assess existing features and conditions, including:

- Existing daily traffic volume (if available);
- Number of through lanes;
- Whether it is divided;
- Functional roadway classification (as per the existing Major Streets and Routes Plans);
- Jurisdictional responsibility;

Table 2-1 shows the results of the existing roadway inventory.

2.2 *Loop Corridor Current Roadway Designations*

Some of the routes that are being evaluated for the Loop System are designated as state highways; states routes, or are part of the National Highway System. Definitions of these routes are:

- **State routes** are right-of-way (whether actually used as a highway or not) that is designated by the State Transportation Board as a location for the possible development of a state highway (Arizona Revised Statute 28-101). Some state routes are designated over existing city streets or county roads but are not yet state highways because they do not meet state highway specifications. Examples of these are Grant Road and Kolb Road. In other cases, planning routes may exist where no road exists. Both of these are often referred to as *paper routes*. They are subject to the same transfer or abandonment procedures as other routes. A road must first be designated as a state route before it can become a state highway under Arizona Law (ARS 28-7041). The historical designation of state routes in the PAG region is summarized in Table 2-2. State routes were designated in the PAG region during the time period 1981-1991.

- **State highways** are a state route or portion of a state route that is accepted and designated by the State Transportation Board as a state highway and that is maintained by the state (Arizona Revised Statute 28-101).

- **National Highway System** routes are roadways that are important to the nation's economy, defense, and mobility. The NHS was developed by the U.S. Department of Transportation (USDOT) in cooperation with the states, local officials, and metropolitan planning organizations (Source: Federal Highway Administration).
<table>
<thead>
<tr>
<th>Street Name</th>
<th>ADT (Year)</th>
<th>Paved?</th>
<th>Number of Through Lanes</th>
<th>Divided?</th>
<th>Major Streets and Routes Classification</th>
<th>Jurisdiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alvernon Way</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valencia Road to Drexel Road</td>
<td>17.9 - 23.0 (2003)</td>
<td>Yes</td>
<td>4</td>
<td>CLTL</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Drexel Road to Golf Links Road</td>
<td>23.0 - 54.5 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Major Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Golf Links Road to Speedway Boulevard to River Road</td>
<td>9.1 - 36.9 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td></td>
<td>20.3 - 33.8 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>CLTL</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Barazzza-Aviation Parkway</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western half</td>
<td>23.1 - 28.1 (2004)</td>
<td>Yes</td>
<td>6</td>
<td>Yes</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Eastern half</td>
<td>27.8 - 30.3 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Craycroft Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunrise Drive to River Road</td>
<td>14.4 (2003)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Golf Links Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alvernon Way to Wilmot Road</td>
<td>48.1 - 68.5 (2003)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Wilmot Road to Harrison Road</td>
<td>27.6 - 44.3 (2003)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Harrison Road to Houghton Road</td>
<td>11.5 (2003)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Grant Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-10 to Swan Road</td>
<td>41.5 - 63.3 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>CLTL</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Swan Road to Kolb Road</td>
<td>51.4 - 57.0 (2004)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Arterial</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Houghton Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sahuarita Road to Dawn Road</td>
<td>4.2 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>CLTL*</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Dawn Road to Redington Road</td>
<td>9.4 - 19.2 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>CLTL*</td>
<td>Arterial/Scenic Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Redington Road to Snyder Road</td>
<td>7.2 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>CLTL*</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Ina Road/Skyline Drive/Sunrise Drive</td>
<td>7.1 - 42.5 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Kolb Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-10 to Escalante Road</td>
<td>13.8 - 45.5 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>Escalante Road to Grant Road</td>
<td>48.1 - 58.7 (2004)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>La Cholla Boulevard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prince Road to River Road</td>
<td>24.9 - 26.3 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>River Road to Orange Grove Road</td>
<td>10.6 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Major Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Orange Grove Road to Magee Road</td>
<td>18.9 - 20.1 (2004)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Major Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Magee Road to Tangerine Road</td>
<td>9.4 - 20.1 (2004)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Route</td>
<td>Town of Oro Valley/Pima County</td>
</tr>
<tr>
<td>Orange Grove Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-10 to Mona Lisa Road</td>
<td>15.4 - 39.4 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>CLTL</td>
<td>Major Route</td>
<td>Town of Marana/Pima County</td>
</tr>
<tr>
<td>Mona Lisa Road to Skyline Drive</td>
<td>17.4 - 18.3 (2004)</td>
<td>Yes</td>
<td>2</td>
<td>CLTL*</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>River Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thornydale Road to Campbell Avenue</td>
<td>17.1 - 39.9 (2003)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Campbell Avenue to Alvernon Way</td>
<td>25.7 - 31.5 (2004)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Swan Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Los Reales Rd. to Old Vail Connection Rd.</td>
<td>N/A</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Tangerine Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oracle Road (SR-77) to I-10</td>
<td>6.6 - 14.8 (2003)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Scenic Route</td>
<td>Town of Marana/Town of Oro Valley</td>
</tr>
<tr>
<td>Twin Peaks Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandario Road to Silverbell Road</td>
<td>10.7 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>No</td>
<td>Major Scenic Route</td>
<td>Town of Marana</td>
</tr>
<tr>
<td>Silverbell to Camino de Oeste</td>
<td>20.8 (2002)</td>
<td>Yes</td>
<td>2</td>
<td>Median</td>
<td>Major Road Network</td>
<td>Town of Marana</td>
</tr>
<tr>
<td>Valencia Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ajo Highway to Camino de la Tierra</td>
<td>3.8 - 23.5 (2003)</td>
<td>Yes</td>
<td>2</td>
<td>CLTL</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
<tr>
<td>Camino de la Tierra to I-19</td>
<td>32.7 - 46.6 (2002)</td>
<td>Yes</td>
<td>6</td>
<td>Median</td>
<td>Arterial/ Gateway Route</td>
<td>City of Tucson</td>
</tr>
<tr>
<td>I-19 to Alvernon</td>
<td>28.1 - 29.3 (2004)</td>
<td>Yes</td>
<td>4</td>
<td>Median</td>
<td>Major Scenic Route</td>
<td>Pima County</td>
</tr>
</tbody>
</table>

* Indicates that this roadway alternates between a roadway with and without a continuous left-turn lane
** Indicates that the bicycle path is a planned improvement
Note: CLTL = Center left turn lane
<table>
<thead>
<tr>
<th>No.</th>
<th>Route</th>
<th>Description</th>
<th>Resolution</th>
<th>Date</th>
<th>Did Resolution note facility as part of PAG Freeway/Expressway System?</th>
<th>Designated State Highway?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SR 983</td>
<td>Houghton Rd. Sahuarita Rd. north to Golf Links</td>
<td>86-01-A-07</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>SR 210* and SR 810</td>
<td>Aviation Corridor I-10 at St. Mary's east to Alvernon Way and Golf Links Corridor (Alvernon to Pantano Parkway)</td>
<td>82-03-A-17</td>
<td>4/16/1982</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>SR 489</td>
<td>Alvernon Way Valencia Rd. north to Grant Rd.</td>
<td>86-01-A-05</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>SR 910</td>
<td>Valencia Extension - East Kolb Rd. east to Houghton Rd.</td>
<td>86-01-A-12</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>SR 910</td>
<td>Valencia Extension - West SR 86 east to I-19</td>
<td>86-01-A-13</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>SR 989</td>
<td>Sandario/San Joaquin Highway SR 86 north to I-10 via Manville Rd.</td>
<td>86-01-A-09</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>SR 989</td>
<td>Tangerine Rd. Highway First Ave. east to SR 77</td>
<td>91-09-A-73</td>
<td>9/20/1991</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>SR 989</td>
<td>Tangerine Rd. Highway</td>
<td>86-01-A-10</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>SR 110</td>
<td>Kolb-Grant Loop Corridor I-10 east to Kolb Rd. south on Kolb to I-10</td>
<td>81-11-A-47</td>
<td>11/20/1981</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>SR 910</td>
<td>Valencia - Bilby Corridor I-19 east to I-10</td>
<td>81-11-A-47</td>
<td>11/20/1981</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>SR 589</td>
<td>Campbell Ave. / Kino Highway Valencia Rd. north to Grant Ave.</td>
<td>86-01-A-06</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>SR 982</td>
<td>Sahuarita Rd. Highway I-19 east to I-10</td>
<td>86-01-A-08</td>
<td>1/20/1986</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>SR 810</td>
<td>Golf Links Extension Highway Camino Seco east to Houghton Rd.</td>
<td>86-01-A-11</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>SR 210</td>
<td>Aviation Corridor I-10 to Golf Links Rd.</td>
<td>83-03-A-09</td>
<td>2/18/1983</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Resolution defined SR 210 as State Route - existing State Route includes St. Mary’s Road east to Broadway Blvd only.
**Not designated a state highway via this resolution.

Source: ADOT Engineering District II, Pima County, Arizona
3. **Needs and Performance Assessment for Loop Corridors**

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

- Improve regional mobility and continuity.
- Attract sufficient travel demand volume to warrant a major transportation facility.
- Provide congestion relief to other transportation facilities.

Section 3.1 describes the transportation demand model and the modeling process that formed the basis of the needs analysis. Section 3.2 presents the findings and conclusions of the needs analysis. Section 3.3 describes how the loop corridor system affects the regional transportation system performance.

### 3.1 Travel Demand Modeling Process – Beyond 2030

In order to determine future travel demands, a transportation model was developed to represent future development of the PAG region. Population growth trends indicate that growth is anticipated to occur in the southeast, Tucson Mountain and Houghton Road areas, as well as “in-fill” of vacant land and redevelopment in Tucson, Marana, Sahuarita and Oro Valley. A transportation model was developed to reflect these trends, which indicate a future regional population of 2.1 million persons. This level of growth is anticipated to occur at some point in the future beyond the year 2030. For this reason, the regional model was termed the “Beyond 2030” model. This model was specially run for this study by the project consultant.

The Beyond 2030 model was run for two cases:

1. **Base** - This model included roadway improvements included in the PAG 2030 model, and the socioeconomic data described below. The model also included recommendations from recent transportation planning studies, described later in this section. This base roadway network is depicted in Figure 3-1.

2. **Base + Loop Corridors** - This model also included the roadway improvements included in the PAG 2030 model, and included the loop corridors, which are described later in this section.

The travel demand modeling inputs were based on the following regional socioeconomic conditions, shown in Table 3-1:

<table>
<thead>
<tr>
<th>Model Inputs</th>
<th>2030 Model</th>
<th>Beyond 2030 Models</th>
<th>Percent Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,500,000</td>
<td>2,100,000</td>
<td>40%</td>
</tr>
<tr>
<td>Employment</td>
<td>700,000</td>
<td>950,000</td>
<td>36%</td>
</tr>
<tr>
<td>Housing Units</td>
<td>600,000</td>
<td>850,000</td>
<td>42%</td>
</tr>
</tbody>
</table>
Figure 3-1
Beyond 2030
Base Network

Legend
- Freeway (Full Access Control)
- Parkway (Restricted Access Control)
- Arterial (Either Limited or No Access Control)
- Other Roadway
- Pima County Line

NOTE: LINES SHOWN ARE NOT EXACT LOCATIONS AND ARE SUBJECT TO REFINEMENT
The travel demand modeling inputs also reflected changing area type characteristics in which urban area travel characteristics were expanded to account for areas that were expected to become infilled, such as Marana, Sahuarita, and the southeast area of Tucson.

The model was also revised to reflect the recommendations of the *I-10 Corridor Study Draft Traffic Report* (July, 2005) and the *I-19 Corridor Study, I-10 to Pima / Santa Cruz County Line* (October 2003). In addition, the future roadway system in the southeast area of Tucson was incorporated into the model, based on the findings of the *Southeast Area Arterial Study* (January, 2005) which provides recommendations for a major streets and routes plan in the southeast portion of Pima County.

The candidate corridors, originally defined in consultation with PAG and the TAC, were assigned a facility type (e.g., arterial, parkway, and freeway) and number of lanes. These were assigned to be consistent with what is needed to support the projected traffic volumes. **Table 3-2** shows the facility type and number of lanes assigned to each corridor segment.

### Table 3-2 – Lanes and Facility Level Assignments by Corridor Segment

<table>
<thead>
<tr>
<th>Corridor Segment</th>
<th>Segment Description</th>
<th>Initial Model Assumptions for Facility Level and Number of Lanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Houghton/Golf Links/Swan Loop</td>
<td>Houghton Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Golf Links Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Swan Road: 6-lane parkway</td>
</tr>
<tr>
<td>2</td>
<td>Southwest Outer Loop</td>
<td>4-lane freeway</td>
</tr>
<tr>
<td>3</td>
<td>Southwest Inner Loop</td>
<td>6-lane freeway</td>
</tr>
<tr>
<td>4</td>
<td>River / Alvernon Corridor</td>
<td>River Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alvernon Way: 6-lane parkway</td>
</tr>
<tr>
<td>5</td>
<td>Kolb/Northern I-10 Loop</td>
<td>Kolb: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grant Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Craycroft Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sunrise Drive: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orange Grove Road: 6-lane parkway</td>
</tr>
<tr>
<td>6</td>
<td>Houghton / Sunrise Corridor</td>
<td>Houghton Road: 6-lane parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sunrise: Access controlled 6 lanes</td>
</tr>
<tr>
<td>7</td>
<td>Oracle Junction / La Cholla Corridor</td>
<td>La Cholla Blvd: 6-lane parkway (to Tangerine Rd)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-lane parkway (to SR 77 junction)</td>
</tr>
<tr>
<td>8</td>
<td>Barraza- Aviation Corridor</td>
<td>Barraza-Aviation Extension: 6-lane parkway</td>
</tr>
<tr>
<td>9</td>
<td>Tangerine/ Valencia Loop</td>
<td>Tangerine Road: 6-lane arterial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valencia Road: 8-lane freeway</td>
</tr>
<tr>
<td>10</td>
<td>Tanque Verde Corridor</td>
<td>6-lane parkway</td>
</tr>
</tbody>
</table>
3.2 Needs Analysis Findings

The corridors depicted in Figure 3-2 (also shown in Figure 1-3) were assessed to determine if there was a need for the corridor. This was accomplished by reviewing the projected travel demand in order to give an assessment based on the following criteria:

- Does the facility improve regional mobility and continuity?
- Does the facility attract sufficient volume for a major transportation facility (Do they ‘load’)?
- Does the corridor provide congestion relief to other transportation facilities and areas?

Table 3-3 is a summary of needs analysis findings for each corridor, and the degree to which future buildout travel on each corridor segment satisfies the required criteria.

Table 3-3 – Needs Analysis Summary

<table>
<thead>
<tr>
<th>Segment Name</th>
<th>Criteria # 1 – Does the facility improve regional mobility and continuity?</th>
<th>Criteria # 2 – Does the facility attract sufficient volume for a major transportation facility (Do they ‘load’)?</th>
<th>Criteria # 3 – Does the corridor provide congestion relief to other transportation facilities and areas?</th>
<th>Needs Analysis Conclusions</th>
</tr>
</thead>
</table>
| Southwest Outer Loop | Yes  
  - Provides alternative route to I-10 and I-19.  
  - Alternative freight route.  
  - Links Sahuarita to Marana.  
  - Links to I-10 and I-19 to SR 86. | Yes  
  - Freeway volumes between I-10 and Valencia  
  - Traffic volumes decrease west of I-19 and east of Kolb (need questionable as freeway).  
  - Traffic volumes increase north of SR 86, but not to freeway volumes. | Yes  
  - Relieves congestion on I-19 and I-10. | Although a freeway facility is not needed for entire length, reserving ROW for future freeway facility is recommended. |
| Southwest Inner Loop (Sahuarita Corridor) | Yes  
  - Links the Tucson Airport, Puerto Nuevo to I-19 and I-10.  
  - Links to SR 86. | Yes  
  - Freeway volumes east of SR 86  
  - Traffic volumes decrease east of Kolb (Parkway Kolb to Houghton) | Yes  
  - SR 86 to I-10 segment relieves congestion on I-10 but traffic volumes do not warrant freeway. | Although traffic volumes are not at freeway levels east of Kolb Road, reserving ROW for a future freeway facility is recommended. |
| Houghton/ Golf Links/ Swan Road | Yes  
  - Links southeast area to central Tucson | Yes  
  - Parkway with GSIs needed (demand exceeds capacity). | Yes  
  - Relieves congestion on 22nd Street. | This corridor demonstrates need for a Parkway with GSIs. |
| River/Alvernon Corridor | Yes  
  - Connects I-10 to northeast Tucson.  
  - Connects I-10 to Houghton/Golf Links Loop. | Yes  
  - Parkway with GSIs needed (demand exceeds capacity). | Yes  
  - Relieves congestion on Ina, Orange Grove and Prince Road.  
  - Alvernon Road segment | This corridor demonstrates need for a Parkway with GSIs. |
<table>
<thead>
<tr>
<th>Segment Name</th>
<th>Criteria # 1 – Does the facility improve regional mobility and continuity?</th>
<th>Criteria # 2 – Does the facility attract sufficient volume for a major transportation facility (Do they ‘load’)?</th>
<th>Criteria # 3 – Does the corridor provide congestion relief to other transportation facilities and areas?</th>
<th>Needs Analysis Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolb/Northern I-10 Loop</td>
<td>☑ Yes  • Connects southeast area to northeast and northwest areas.</td>
<td>☑ Yes  • Parkway needed on Orange Grove Road east of La Cholla (arterial volumes west of La Cholla). Parkway with GSIs needed on Kolb Road, Valencia to Grant Rd.</td>
<td>☑ Yes  • Relieves congestion on Ina Road corridor (Ina to remain an arterial).</td>
<td>Parkway needed on Orange Grove Road east of La Cholla and on remainder of route. Parkway with GSIs needed on Kolb Road, Valencia to Grant Rd.</td>
</tr>
<tr>
<td>Houghton / Sunrise Corridor</td>
<td>☑ Yes  • Connects southeast area to northeast and northwest areas.  • Connects Houghton to Ina Road/Orange Grove Road</td>
<td>☑ Yes  • Parkway with GSIs needed between I-10 and Golf Links Road</td>
<td>☑ Yes  • Relieves congestion on parallel facilities.</td>
<td>This corridor demonstrates need for a parkway with GSIs on Houghton Road between I-10 and Golf Links Road. Arterial facilities are needed elsewhere.</td>
</tr>
<tr>
<td>Oracle Junction / La Cholla Corridor</td>
<td>☑ Yes  • Connects I-10 at Ruthrauff interchange to SR 77 near Oracle junction.</td>
<td>☑ Yes  • Parkway with GSIs needed south of Tangerine Road</td>
<td>☑ Yes  • Relieves congestion on SR 77.</td>
<td>This corridor demonstrates need for a parkway. GSIs indicated on La Cholla south of Tangerine Road.</td>
</tr>
<tr>
<td>Barraza-Aviation Corridor</td>
<td>☑ Yes  • Connects I-10 to downtown Tucson</td>
<td>☑ Yes  • Attracts parkway level traffic volumes</td>
<td>☑ Yes  • Relieves congestion on I-10.</td>
<td>This corridor demonstrates need for a Parkway.</td>
</tr>
<tr>
<td>Tangerine/Valencia Loop (includes option for Twin Peaks Road connection)</td>
<td>☑ Yes  • Connects I-10 and SR 77.</td>
<td>☑ No  • Tangerine Road traffic volumes are decreasing beyond 2030, and a portion of the 2030 projected volumes are attracted to other facilities. (see discussion in text on page 19). Similarly Twin Peaks Road connection did not attract sufficient volume</td>
<td>☑ No  • Does not relieve congestion significantly on parallel routes.</td>
<td>Tangerine Road and Twin Peaks Road do not attract sufficient traffic volume for a freeway or parkway. Tangerine Road is a candidate for a limited access controlled arterial.</td>
</tr>
</tbody>
</table>

GSI = Grade-separated interchange
Figure 3-2
Loop System Candidate Corridor Evaluation Segments

Legend
- Tanque Verde
- Tangerine/Ventura Loop
- Barraza-Aviation Corridor
- Oracle Junction/La Cholla Corridor
- Houghton/Sonrise Corridor
- Kolb/Northern I-10 Loop
- River/Alvernon Corridor
- Southwest Inner Loop
- Southwest Outer Loop
- Houghton/Golf Link/Swan Loop

Road
Pima County Line

NOTE: LINES SHOWN ARE NOT EXACT LOCATIONS AND ARE SUBJECT TO REFINEMENT
Needs were not demonstrated for either freeway or parkway facilities on the following loop system elements:

1. Tangerine Road  
2. Houghton Road, north of Golf Links Road  
3. Ina Road  
4. Orange Grove Road, west of La Cholla Boulevard  
5. Snyder Road connection to Houghton Road.

These may be candidates for restricted access arterials but volume ranges do not justify higher facility classifications.

3.2.1 Tangerine Road

One aspect of the modeling work was that Tangerine Road appeared to lose significance as a regional route, and travel demand volumes decreased as compared to 2030 travel demand volumes. A comparison of these data indicated that other north-south Loop corridor routes are attracting travel demand volumes from this roadway facility. In particular, the La Cholla parkway appears to be drawing traffic from this route. Previous travel demand forecasting work indicated that Tangerine Road travel demand volumes were increasing in the absence of major north-south corridors. When additional north-south corridors were added to the Loop Corridor system, these corridors drew traffic from Tangerine Road.

3.2. 2 Revised Loop Corridor Concept Advanced to Feasibility Analysis

Based on the results of the analysis described above, and input from the Technical Advisory Committee and PAG, the original loop study corridors were further refined in order to eliminate corridors or corridor segments that did not serve the evaluation criteria described above. The loop corridors were also revised to provide corridors that did not overlap, e.g. provided unique corridor segments.

It should be noted that on the Western Freeway alignment, there is a wide swath shown on Valencia Road. This is to depict that the corridor could be centered on other east-west routes in this general area, such as Drexel Road or Los Reales Road.

The La Cholla Parkway corridor was also revised to show that the corridor will avoid impacts to the Pinal Airpark, and the Stone Canyon area, as well as the current boundaries of the Tortolita Mountain Park.

The revised Loop Corridors are depicted in Figure 3-3. The Loop Study Corridor Concept that was advanced to the feasibility assessment includes the following facilities, as summarized in Table 3-4:
### Table 3-4 – Summary of Loop Study Corridors Advanced to Feasibility Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Facility Type, Mileage and Number of Lanes</th>
<th>Other Facility Features</th>
<th>Segment Description</th>
<th>Beyond 2030 Travel Demand Volume (thousand of Vehicles per day)</th>
</tr>
</thead>
</table>
| Western Freeway Loop        | - 31.5 miles: 4-lane freeway (I-10 to Valencia Rd)  
- 4.2 miles: 6-lane freeway (Valencia Road, 4.2 miles west of Mark Road to Mark Rd)  
- 13.3 miles: 8-lane freeway (Valencia Rd between Mark Road and Kolb Road)          | 4 system interchanges        | Western Freeway, I-10 to Valencia Rd  
Western Freeway, 4.2 miles west of Mark Road to Mark Rd  
Valencia Rd, Mark Road to Kolb Road                                                                 | 37-80  
80  
140-200+                                                                 |
| Southern Freeway Loop       | - 29.6 miles: 4-lane freeway (Western Freeway to I-19)  
- 9.4 miles: 6-lane freeway (Swan to I-19)  
- 20.6 miles: 8-lane freeway (Kolb Road, Valencia to Swan) | 4 – 5 system interchanges    | Southern Freeway, Western Freeway to I-19  
Southern Freeway, Swan to I-19  
Kolb Road, Valencia to Swan)                                                   | 17-45  
60-109  
200+                                                                 |
| Houghton / Golf Links Parkway | - 22 miles: 6-lane parkway                                                                            | Grade-separated interchanges | Houghton Road, Golf Links Road to Southern Freeway Loop  
Golf Links Road: Alvernon to Houghton:                                                                 | 65-92  
62-86                                                                 |
| River / Alvernon / Swan Parkway | - 32.5 miles: 6-lane parkway                                                                         | Grade-separated interchanges | River Road, Thornydale to Alvernon  
Alvernon Way, River to Valencia Road  
Swan Road , Valencia Road to Southern Freeway Loop                                                                 | 76 - 82  
66-100  
66-95                                                                 |
| Kolb/Orange Grove Parkway   | - 12 miles: 4-lane parkway  
- 14 miles: 6-lane parkway                                                                             | Grade-separated interchanges needed on Kolb Road (Valencia Road to Grant Rd)  
Orange Grove Road, La Cholla Blvd to Skyline Drive                                                                 | 80-127  
56-37                                                                 |
| La Cholla Corridor Parkway  | - 10 miles: 4-lane parkway (SR 77 to Tangerine Road)  
- 10 miles: 6-lane parkway (Tangerine Road to I-10)                                                      | Grade-separated interchanges needed south of Tangerine Road | La Cholla, SR 77 to Tangerine Road  
La Cholla, Tangerine Road to I-10                                                                 | 36-71  
74-89                                                                 |
| Barraza- Aviation Parkway   | - 4 miles: 6-lane parkway                                                                             | 1 system interchange         | Barraza Aviation Parkway, Golf Links Road to Valencia Rd/I-10                                                                 | 44-80                                                                 |

The corridor segments that were not carried forward and the volume ranges for these corridors are summarized in Table 3-5:
Table 3-5 – Summary of Loop Study Corridors or Corridor Segments Not Advanced to Feasibility Analysis

<table>
<thead>
<tr>
<th>Corridor Segments</th>
<th>Beyond 2030 Traffic Forecast Volume Range (thousands of vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangerine Road</td>
<td>15 -21</td>
</tr>
<tr>
<td>Houghton Road, north of Golf Links Road</td>
<td>14 – 31</td>
</tr>
<tr>
<td>Ina Road</td>
<td>18 – 30 (east of La Cholla Boulevard)</td>
</tr>
<tr>
<td>Orange Grove Road, west of La Cholla Boulevard</td>
<td>27-28</td>
</tr>
<tr>
<td>Snyder Road connection to Houghton Road.</td>
<td>Since Houghton Road was not carrying a large forecast traffic volume, this connection was not deemed feasible.</td>
</tr>
</tbody>
</table>
Figure 3-3
Justified High Capacity Corridors (based on demand analysis only)
3.3 Regional Mobility

Overall system mobility was evaluated by analyzing the percentage of the network that is congested (V/C greater than 1) and very congested (V/C greater than 1.5). Table 3-5 presents mobility performance measures for the entire transportation system.

Table 3-5 – Overall Mobility Performance

<table>
<thead>
<tr>
<th>Scenario</th>
<th>VHT</th>
<th>Percent of network congested (V/C &gt; 1)</th>
<th>Percent of Network Very Congested (V/C &gt; 1.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beyond 2030 Base</td>
<td>1,625,119</td>
<td>46.9%</td>
<td>29.2%</td>
</tr>
<tr>
<td>Base + Loop Corridors</td>
<td>1,328,773</td>
<td>37.5%</td>
<td>18.9%</td>
</tr>
<tr>
<td>Deviation from Base</td>
<td>-18.24%</td>
<td>-20.08%</td>
<td>-35.32%</td>
</tr>
</tbody>
</table>

Source: Cambridge Systematics, 2005

Key findings for overall mobility performance are summarized as follows:

- The Loop Corridors are providing alternative routes for overcapacity corridors.
- Vehicle hours of travel decline by 18 percent, despite the 11 percent increase in volumes. This suggests that the loop system provides greater efficiency of travel movements.
- Network congestion declines substantially. Over 45 percent of roads are over capacity in the Beyond 2030 Base, which is reduced by 20 percent with inclusion of the loop corridors. The percent of roads that are very congested (with a v/c ratio greater than 1.5) declines by over 35 percent (from 29 percent to 19 percent).

Examining the mobility measures by functional class identifies the shifting patterns of travel in the PAG region. Table 3-6 presents the performance of the urban roads, by functional class. Some of the key findings from this analysis include:

- The loop corridor system involves the construction of substantial new miles of freeway.
- Most of the remainder of the loop system shifts existing roadways from lower to higher functional class (i.e., major arterial to parkway and minor to major arterial). This causes an attendant shift in traffic patterns, from lower to higher functional classes.
Table 3-6 – Mobility Performance by Functional Class (Urban Roads Only)

<table>
<thead>
<tr>
<th>Functional Class</th>
<th>Roadway Miles</th>
<th>VMT (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td>Base + Loop Corridors</td>
</tr>
<tr>
<td>Freeway</td>
<td>157</td>
<td>336</td>
</tr>
<tr>
<td>Parkway</td>
<td>227</td>
<td>274</td>
</tr>
<tr>
<td>Major Arterial</td>
<td>870</td>
<td>972</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>948</td>
<td>849</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2202</td>
<td>2431</td>
</tr>
</tbody>
</table>

3.3.2 Freight Movements

Tucson sits at the crossroads of I-10 and I-19. As a result, substantial domestic and international freight passes through the region. Two of the proposed loop roads stand out as potential freight bypasses:

- The Western Freeway Loop provides a potential bypass for freight movements around the congested I-10 corridor. If used as a freight route, this would reduce truck traffic passing through the congested urban core of Tucson.
- The Southern Freeway Loop provides a southern extension of this potential bypass and also provides a potential I-19 to I-10 east bypass. This latter bypass would provide an alternate route for traffic connecting Mexico with states to the east of Arizona.

Western Freeway Loop (Bypass of I-10) - A substantial volume of freight travels along I-10 through Pima County. Between domestic freight traveling between California and other states and international freight passing through Nogales, an estimated 35 million tons of freight moves on I-10 through Tucson each year. By 2030, through freight on I-10 is expected to grow to at least 60 million tons per year and could be higher, depending on a number of external factors. Congestion on I-10, especially during peak hours, could mean a substantial shift of freight movements to the Western bypass. However, truck movements are often scheduled to avoid peak periods to the best extent possible. Peak delay on I-10 is likely to be much worse than off-peak delay, given the size of the metropolitan area. Because the Western bypass would add several miles to the existing route, most truckers are likely to want to use I-10. Potential policies to help increase the use of the Western Loop could include:

- Setting speed limits to encourage the use of the Western Loop over I-10 for through traffic.
- High-Occupancy Toll (HOT) lanes along I-10 for automobiles only could shift behavior as the capacity of I-10 for trucks was reduced. Demand for these lanes would depend on a number of factors, especially peak period volumes and congestion, cost, and other factors.
- Truck toll lanes on I-10 would provide substantial encouragement to use free lanes elsewhere. However, there would be several problems with this. Unless trucks were required to use the toll lanes on I-10 (which would require legal changes), these lanes might get little use.

**Southern Loop (I-19 to East I-10 Bypass)** - In 2003, 6 million tons of goods were trucked through Arizona on their way to or from Mexico. This total is also likely to grow, but will never compare to the total through movements on I-10. In addition, over half of this traffic either originates in or is destined for California. Even if the total amount of traffic doubled over the next twenty years, only about 6 million tons of freight would be trucked from I-19 to I-10 east. Much of the traffic using I-19 that is headed west on I-10, however, would likely see the Western bypass as a relatively convenient option. Overall, there could be some reduction of truck traffic at the I-10 / I-19 interchange. However, given the volume of truck traffic with origins and destinations in Pima County, this improvement may be hard to notice.
4. **CORRIDORS FEASIBILITY ANALYSIS**

The corridors feasibility analysis includes an assessment of physical constructability, environmental issues, and area plan compatibility. This chapter identifies significant engineering, environmental, or area plan compatibility issues that must be addressed if the roadway projects are advanced for further development.

4.1 **Feasibility Evaluation Criteria**

The feasibility evaluation is comprised of three major components. These are physical constructability screen, environmental screen, and area plan screen. These screens are described below.

**Physical Constructability Screen** - Physical and engineering features include roadway conditions and structures, right-of-way, topography, geological characteristics, major drainage features, and major utilities within the study area. Physical features that might preclude the construction of the intended improvements will be identified and itemized.

**Environmental Screen** - 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). Environmental features and regulatory requirements that might preclude the construction of the intended improvements will be identified and evaluated.

**Land Use/ Area Plan Compatibility Screen** - Criteria include compatibility with adopted transportation and land use plans.

Each of these three screens is summarized in the sections that follow.

4.2 **Physical Constructability Screen**

4.2.1 **Land Use /Land Ownership**

Current land ownership in the region is summarized in Figure 4-1, which includes an overlay of the loop corridors under consideration. A summary of the land ownership that each corridor may impact, as well as potential issues involving land use and ownership, is summarized in Table 4-1.
Table 4-1 – Major Land Ownership on Loop Corridors

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Major Land Ownership Within Corridor</th>
<th>Land Use Issues / Potential Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Tohono O’odham Nation</td>
<td>Proximity of route to Tohono O’odham Nation, Pascua Yaqui Nation land, COT recharge wells, and planned wells, Central Arizona Project, and Ironwood Forest National Monument, Saguaro National Park West, Tucson Mountain Park</td>
</tr>
<tr>
<td></td>
<td>Pascua Yaqui Nation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td>State Trust</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BLM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>City of Tucson</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Central Arizona Project</td>
<td></td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Tohono O’odham Nation</td>
<td>Potential conflicts with Tohono O’odham San Xavier District land.</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td>State Trust</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BLM Land</td>
<td></td>
</tr>
<tr>
<td>Houghton/ Golf Links</td>
<td>Private</td>
<td>Conflicts with existing residential and commercial development.</td>
</tr>
<tr>
<td>Parkway</td>
<td>State Trust</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Davis-Monthan Air Force Base</td>
<td></td>
</tr>
<tr>
<td>River /Alvernon/Swan</td>
<td>Private Land</td>
<td>Conflicts with existing residential and commercial development.</td>
</tr>
<tr>
<td>Parkway</td>
<td>State Trust Land</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kolb/Orange Grove</td>
<td>Private</td>
<td>Potential conflicts with existing residential and commercial development.</td>
</tr>
<tr>
<td>Parkway</td>
<td>State Trust</td>
<td>Kolb Road is already access-controlled through Davis-Monthan Air Force Base.</td>
</tr>
<tr>
<td></td>
<td>Davis-Monthan Air Force Base</td>
<td></td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>State Trust *</td>
<td>Potential conflicts with existing residential and commercial development and with planned Tortolita Park expansion. Impacts to the private La Cholla Airpark and residences associated with the Airpark are a concern.</td>
</tr>
<tr>
<td></td>
<td>Private Land</td>
<td></td>
</tr>
<tr>
<td>Barraza- Aviation</td>
<td>Private</td>
<td>Potential conflicts with existing development and Davis-Monthan Air Force Base.</td>
</tr>
<tr>
<td>Parkway Extension</td>
<td>Davis Monthan Air Force Base</td>
<td></td>
</tr>
</tbody>
</table>

*The State Trust Land is planned to be used as part of the Tortolita Mountain Park

During future development of these alignments, a more detailed study of alignments would be required to determine specific right-of-way location in a surveyable manner and land use impacts.
4.2.2 Utilities / Railroad Infrastructure

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 Union Pacific Railroad, in which the tracks run parallel and to the east of I-10 and I-19. **Table 4-2** summarizes potential utility and railroad crossing constraints. All of the loop corridors will involve utility and railroad crossing constraints.

**Table 4-2 – Utility and Railroad Impacts**

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Utility and Railroad Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>3 power line crossings 2 railroad crossings</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>3 power line crossings 3 railroad crossings</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>2 power line crossings 1 railroad crossing</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>3 power line crossings 2 railroad crossings</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>2 power line crossings 1 railroad crossings</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>1 railroad crossing</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>1 railroad crossing</td>
</tr>
</tbody>
</table>

4.2.3 Topography

Tucson is centrally located within the 1,000 square mile Tucson Basin and has an elevation of approximately 2,500 feet. It is bordered by narrow, rugged mountain ranges. The Tucson Basin’s northeastern boundary is formed by the Santa Catalina and Rincon Mountains, and its western boundary is formed by the Tucson Mountains. The Santa Rita Mountains are to the south, the Sierrita Mountains are located to the southwest and the Tortolita Mountains are located to the north. The mountains form the major topographic constraints to the development of future corridors. **Table 4-3** summarizes topographic constraints that may impact development of the corridors.

As **Table 4-3** indicates, the Southern Freeway Loop and the La Cholla Parkway cross areas with significant grade changes.
Table 4-3 – Major Topography Constraints on Loop Corridors

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Topography Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>No significant constraints noted.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Crosses areas with significant grade changes (west area of loop)</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>No significant constraints noted.</td>
</tr>
<tr>
<td>River/Alvernon/Swan Parkway</td>
<td>No significant constraints noted.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>No significant constraints noted.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Tortolita Mountains</td>
</tr>
<tr>
<td>Barraza - Aviation Parkway Extension</td>
<td>No significant constraints noted.</td>
</tr>
</tbody>
</table>

4.2.4 Drainage

A significant consideration for roadway development is drainage and the mitigation of storm water run-off. The largest mapped floodplain in the PAG Region is the Brawley Wash, a large tributary of the Santa Cruz River that is located west of the Santa Cruz River. The Santa Cruz River is a major north-south feature that passes through the study area. Other significant floodplains include the Canada del Oro Wash in Oro Valley, Tanque Verde Creek in northeastern Tucson, and the Pantano Wash and Rincon River in the eastern portions of the Region. Major washes (those with recorded flows of over 10,000 cubic feet per second) are shown in Figure 4-2. A summary of impacts of the candidate loop corridors on major wash crossings are summarized in Table 4-4. As can be seen in the Table, all of the Loop corridors will have to address major wash crossings, particularly the Western Freeway Loop, which would involve five major wash crossings. Bridges or culverts crossing major washes should be designed to protect the roadway from impacts of scouring or erosion.
Figure 4-2
Major Washes and CAP

Legend
- Western Freeway Loop
- Southern Freeway Loop
- Houghton / Golf Links Parkway
- River / Alvernon / Swan Parkway
- Kolb / Orange Grove Parkway
- La Cholla Parkway
- Bartram-Aviation Parkway

Washes (By Flow Rate CFS)
- Over 25,000 CFS
- 10,000 to 25,000 CFS
- 5,000 to 10,000 CFS
- CAP

Pima County Line
Freeway
Other Road

NOTE: LINES SHOWN ARE NOT EXACT LOCATIONS AND ARE SUBJECT TO REFINEMENT

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Table 4-4 – Major Wash Crossings

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Major Washes Within Loop Corridor Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Black Wash&lt;br&gt;Santa Cruz River (2 crossings)&lt;br&gt;Brawley Wash (2 crossings)</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Santa Cruz River&lt;br&gt;Black Wash</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Pantano Wash (2 crossings)</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>Rillito Creek</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Confluence of Rillito Creek, Tanque Verde&lt;br&gt;Creek, Pantano Wash</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Canada Del Oro&lt;br&gt;Rillito River</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>None</td>
</tr>
</tbody>
</table>

Other drainage considerations include impacts on the FEMA 100-year floodplains. Impacts on existing cross-drainage structures will need to be evaluated as the projects are developed.

4.2.5 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 CAWCD is a political body that imposes a tax to repay the construction and operational costs, and is governed by an elected board.

As shown in Figure 4-2, the CAP canal, which enters the study area from Pinal County, parallel and east of I-10, then crossing I-10 at approximately Tangerine Road and circling the Tucson metropolitan area to the west to Ajo Way, where it diverges north and south. The CAP location affects the Western Freeway Loop, and potentially the Southern Freeway Loop. Considerations in implementing this alternative may include grade-separated crossings, drainage, and environmental protection. The CAP provides water to the City of Tucson recharge wells, to agricultural areas in Marana and Pima County, and the Tohono O’odham nation in the vicinity of the Western Freeway Loop through the use of pipelines from the CAP.

1Source, Central Arizona Project website, http://www.cap-az.com/about/index.cfm?action=cover
because of the CAP’s northwest to southeast orientation, and prior clearance with respect to environmental issues, locating the Western Freeway Loop adjacent to, and directly west of the CAP may be a desirable alternative corridor for the Western Freeway Loop.

4.2.6 City of Tucson Water Facilities

The City of Tucson uses its Central Arizona project allocation via recharge facilities at it’s Central Avra Valley Storage and Recovery Project (CAVSARP) facility, located north of the Tohono O’odham Nation Shuk Toak District, and west of the Central Arizona Project. The CAVSARP is a large-scale recharge and recovery facility which consists of 330 acres of recharge basins, 27 recovery wells, a booster station, an 8-million gallon reservoir and approximately 25 miles of pipelines. According to the Tucson Water’s Water Plan, 2000-2050 (November 2004), this facility uses approximately 45% of the Central Arizona project’s water allocation and makes it available for potable supply. The recharge occurs via pipelines from the CAP to the CAVSARP. An issue is locating the Western Freeway Loop with respect to this facility, and the planned Southern Avra Valley Storage and Recovery Project (SAVSARP), which will become operational in 2007 and will help to achieve the full utilization of the Central Arizona project allocation. This facility, which is under construction, is located on both sides of Sandario Road south of the Tohono O’odham Nation Shuk Toak District.

The City of Tucson also owns numerous land parcels in the west and northwest Tucson region that will be used for water projects in the future. The location of these facilities is shown on Figure 4-3. The impact of the future corridors on potable water distribution lines will also be a consideration as projects are developed. A summary of impacts of the proposed loop corridor routes on City of Tucson Water facilities is summarized in Table 4-5.

Table 4-5 – Major Tucson Water Infrastructure Constraints on Loop Corridors

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Tucson Water Infrastructure Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>- Potential impacts to Central Avra Valley Storage and Recovery Project (CAVSARP).</td>
</tr>
<tr>
<td></td>
<td>- Potential impacts to Southern Avra Valley Storage and Recovery Project (SAVSARP).</td>
</tr>
<tr>
<td></td>
<td>- Potential impacts to CAP water delivery pipeline.</td>
</tr>
<tr>
<td></td>
<td>- Potential impact to recharge recovery pipelines.</td>
</tr>
<tr>
<td></td>
<td>- Potential impact to potable distribution pipeline.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>- Potential impact to potable production wells and distribution pipelines.</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>- Potential Impacts to potable distribution pipeline.</td>
</tr>
<tr>
<td>River/Alvernon/Swan Parkway</td>
<td>- Potential Impacts to potable distribution pipeline.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>- Potential Impacts to potable distribution pipeline.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>- Potential Impacts to potable distribution pipeline.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>- Potential impacts to potable distribution pipeline.</td>
</tr>
</tbody>
</table>
Figure 4-3
Tucson Water Recharge Facilities & Land Ownership

Legend
- Western Freeway Loop
- Southern Freeway Loop
- Houghton / Golf Links Parkway
- River / Alvernon / Swan Parkway
- Kolb / Orange Grove Parkway
- La Cholla Parkway
- Banner-Aviation Parkway
- Pima County Line
- Property
- Other Road
- Existing CAVSARP (Central Arizona Valley Storage and Recovery Project)
- COT Parcels
- Proposed SAVSARP (Southern Arizona Valley Storage and Recovery Project)
- CAP

NOTE: LINES SHOWN ARE NOT EXACT LOCATIONS AND ARE SUBJECT TO REFINEMENT
4.2.7 Right-of-Way and Access

The right-of-way required to implement the proposed loop corridors is estimated for planning purposes to be 150 feet for parkway facilities and 300 feet for freeway facilities. These are standards established by ADOT and many jurisdictions for these types of facilities. To assess right-of-way needs, a comparison was made of the existing road segment right-of-way versus loop corridor freeway or parkway requirements. This comparison is shown in Table 4-6. Also reviewed was whether the road segment would require a resolution of access issues. Examples of ways to resolve access issues could include either purchasing access, providing frontage roads, or accepting less access control. All of the existing road segments will need to have access concerns addressed.

The results of this analysis indicate that new right of way, and right-of-way takes on existing roadways, will occur on all of the loop road corridors.

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>ROW Required (in feet)</th>
<th>Road</th>
<th>Road Segment</th>
<th>ROW Available (in feet)</th>
<th>ROW Needs to be Acquired?</th>
<th>Length of Miles to be Acquired</th>
<th>Requires Resolution of Access Issues?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>300</td>
<td>Valencia Road</td>
<td>Ajo to Cardinal</td>
<td>150-210</td>
<td>Yes</td>
<td>6.7</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cardinal to Midvale Park</td>
<td>150-180</td>
<td>Yes</td>
<td>1.8</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Midvale Park to 12th Avenue</td>
<td>110-250</td>
<td>Yes</td>
<td>1.25</td>
<td>Yes</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>12th Avenue to Campbell Avenue</td>
<td>100-150</td>
<td>Yes</td>
<td>2.0</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Campbell Avenue to Alvernon Way</td>
<td>140-160</td>
<td>Yes</td>
<td>2.0</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alvernon Way to I-10</td>
<td>200-250</td>
<td>Yes</td>
<td>1.3</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I-10 to Kolb Road</td>
<td>200</td>
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<tr>
<td></td>
<td></td>
<td>Trico Road</td>
<td>Avra Valley to Pinal Air Park Road</td>
<td>250</td>
<td>Yes</td>
<td>7.8</td>
<td>Yes</td>
</tr>
<tr>
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<td>Pinal Air Park to I-10</td>
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<td>Yes, new ROW required</td>
<td>2.5</td>
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<td></td>
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<td></td>
<td>New road between Valencia and Trico Road</td>
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<td>22</td>
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<td>Sandario Road</td>
<td>New road (partially along San Xavier District) to I-19</td>
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<td>New road between I-19 to Sahuarita Road</td>
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<td>Kolb Rd</td>
<td>Sahuarita Road to Old</td>
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<td>ROW Required (in feet)</td>
<td>Road</td>
<td>Road Segment</td>
<td>ROW Available (in feet)</td>
<td>ROW Needs to be Acquired?</td>
<td>Length of Miles to be Acquired</td>
<td>Requires Resolution of Access Issues?</td>
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<td>Houghton / Golf Links Parkway</td>
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<td>Vail Connection Rd</td>
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<td>Old Vail Connection Rd to Valencia Rd</td>
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<td>4.4</td>
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<td>New Kolb Rd to I-10</td>
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<td>Sahuarita to Rita</td>
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<td>Rita to Poorman</td>
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<td>Poorman to Irvington</td>
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<td>Irvington to Escalante</td>
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<td></td>
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<tr>
<td>Golf Links Road</td>
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<td>Alvernon to Swan</td>
<td>160-200</td>
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<td>Swan to Craycroft</td>
<td>120-160</td>
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<td>1.1</td>
<td>Yes</td>
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<td>Craycroft to Wilmot</td>
<td>120</td>
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<td>1.0</td>
<td>Yes</td>
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<td></td>
<td></td>
<td>Wilmot to Kolb</td>
<td>150-190</td>
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<td>Yes</td>
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<td>Pantano Parkway to Harrison</td>
<td>175-180</td>
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<td></td>
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<td>Harrison to Houghton</td>
<td>135-210</td>
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<td>Yes</td>
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<td>River / Alvernon / Swan Parkway</td>
<td>150</td>
<td>River Rd</td>
<td>Thornydale to La Cholla</td>
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<td>N/A</td>
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<td>First Ave to Campbell</td>
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<td>Alvernon Rd</td>
<td>River Rd to Fort Lowell Rd</td>
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<td>Alvernon Rd</td>
<td>Fort Lowell Rd to Speedway Blvd</td>
<td>90-150</td>
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<tr>
<td>Loop Corridor Name</td>
<td>ROW Required (in feet)</td>
<td>Road Segment</td>
<td>ROW Available (in feet)</td>
<td>ROW Needs to be Acquired?</td>
<td>Length of Miles to be Acquired</td>
<td>Requires Resolution of Access Issues?</td>
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<td>Alvernon Rd</td>
<td>Speedway Blvd to 22nd Street</td>
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<td>22nd Street to 29th St</td>
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<td>29th St to Ajo Way</td>
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<td>Ajo Way to Valencia Rd</td>
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<td>Orange Grove Rd</td>
<td>La Cholla to First Ave</td>
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<td>3.0</td>
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<td>First Ave to Skyline Dr</td>
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<td>Orange Grove to Hacienda del Sol</td>
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<td>N/A</td>
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<td>Yes</td>
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<td>Hacienda del Sol to Craycroft Rd</td>
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<td>Craycroft Rd</td>
<td>Sunrise Dr to Grant Rd</td>
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<td>Kolb Rd</td>
<td>Speedway Blvd to Broadway Blvd</td>
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<td>Yes</td>
<td></td>
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<td>Kolb Rd</td>
<td>Broadway Blvd to Golf Links Rd</td>
<td>150</td>
<td>No</td>
<td>N/A</td>
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<td>Kolb Rd</td>
<td>Golf Links Rd to Escalante Rd</td>
<td>130-150</td>
<td>Yes, in some areas</td>
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<td>Yes</td>
<td></td>
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<tr>
<td>Kolb Rd</td>
<td>Escalante Rd to Valencia Rd</td>
<td>150-200</td>
<td>No</td>
<td>N/A</td>
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<td>Yes</td>
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<td>Ruthrauff to Orange Grove</td>
<td>90</td>
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<td>Yes</td>
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<td>Orange Grove to Ina</td>
<td>200</td>
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<td>N/A</td>
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<td>Yes</td>
<td></td>
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<td>Ina to Magee</td>
<td>150-160</td>
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<td>Magee to Overton</td>
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<td>Overton to Tangerine</td>
<td>50-120</td>
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<tr>
<td>Tangerine to Moore</td>
<td>120-240</td>
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<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Moore Road to SR 77</td>
<td>N/A</td>
<td>Yes, new ROW required</td>
<td>9.5</td>
<td></td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A (on new alignment)</td>
<td>N/A</td>
<td>Yes, new ROW required</td>
<td>4.2</td>
<td></td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Kolb / Orange Grove Parkway

La Cholla Parkway

Barraza- Aviation Parkway Extension
4.2.8 Summary of Physical Constructability Opportunities and Constraints

A summary of engineering opportunities and constraints for the definition alternatives is presented in Table 4-7.

Table 4-7 – Summary of Physical Constructability Opportunities and Constraints

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Physical Constructability Constraints</th>
<th>Physical Constructability Opportunities</th>
</tr>
</thead>
</table>
| Western Freeway Loop         | • Proximity of route to Tohono O’odham Nation, COT recharge wells, and planned wells, Central Arizona Project, and Ironwood Forest National Monument, Sahuaro National Park West, Tucson Mountain Park CAP Crossing  
• Utility conflicts and 2 railroad crossings  
• Five major wash crossings  
• Tucson Water pipeline and recharge areas  
• Extensive right-of-way requirements and access resolution issues, particularly on Valencia Road. | Location near the CAP may reduce engineering constraints |
| Southern Freeway Loop        | • Potential conflicts with Tohono O’odham San Xavier District land.  
• Utility conflicts and 3 railroad crossings  
• Potential grade issues  
• 2 major wash crossings  
• Potential impact to Tucson Water potable production wells and distribution pipelines.  
• Extensive right-of-way requirements and access resolution issues along existing segments.  
• Location of City of Tucson recharge areas | Use of existing right-of-way  
Use of existing alignment minimizes topographic constraints |
| Houghton/ Golf Links Parkway | • Potential conflicts with existing residential and commercial development  
• Utility conflicts and 1 railroad crossing  
• Two crossings of Pantano Wash  
• Potential impact to Tucson Water potable distribution pipelines.  
• Extensive access resolution issues. | Use of existing right-of-way  
Use of existing alignment minimizes topographic constraints |
| River /Alvernon/Swan Parkway | • Potential conflicts with existing residential and commercial development  
• Utility conflicts and 2 railroad crossings  
• One crossing of Rillito Creek  
• Potential impact to Tucson Water potable distribution pipelines.  
• Extensive access resolution issues. | Use of existing right-of-way  
Use of existing alignment minimizes topographic constraints |
| Kolb/Orange Grove Road Parkway | • Potential conflicts with existing residential and commercial development  
• Utility conflicts and 1 railroad crossing  
• Corridor crosses confluence of Rillito Creek, Tanque Verde Creek, Pantano Wash  
• Potential impact to Tucson Water potable distribution pipelines.  
• Extensive access resolution issues. | Use of existing right-of-way  
Kolb Road is already access-controlled through Davis-Monthan Air Force Base  
Use of existing alignment minimizes topographic constraints |
| La Cholla Parkway            | • Potential conflicts with existing residential and commercial development, including La Cholla Airpark.  
• Impacts to planned mountain park expansion  
• Utility conflicts and 1 railroad crossing  
• Corridor crosses Canada de Oro Wash and  | Use of existing right-of-way on La Cholla.  
Use of existing alignment minimizes topographic constraints |
### Loop Corridor Name

<table>
<thead>
<tr>
<th>Physical Constructability Constraints</th>
<th>Physical Constructability Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rillito River</td>
<td></td>
</tr>
<tr>
<td>- Potential impact to Tucson Water potable distribution pipelines.</td>
<td></td>
</tr>
<tr>
<td>- Right-of-way needs to be acquired in area of extension.</td>
<td></td>
</tr>
<tr>
<td>- Access resolution impacts in developed areas.</td>
<td></td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td></td>
</tr>
<tr>
<td>- Proximity of Davis-Monthan Air Force Base</td>
<td></td>
</tr>
<tr>
<td>- Potential conflicts with existing development.</td>
<td></td>
</tr>
<tr>
<td>- Utility conflicts and 1 railroad crossing</td>
<td></td>
</tr>
<tr>
<td>- Potential impact to Tucson Water potable distribution pipelines.</td>
<td></td>
</tr>
<tr>
<td>- Extensive right-of-way requirements</td>
<td>Level of access resolution required is low.</td>
</tr>
</tbody>
</table>

### 4.3 Environmental Screen

The purpose of the environmental screen is to describe the existing social and environmental conditions within the proposed Loop Study Area, and identify potential environmental concerns for future development of the Loop Study corridors. 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).

#### 4.3.1 Socioeconomic Conditions

Projects that utilize federal aid are required to certify nondiscrimination under the requirements of Title VI of the Civil Rights Act of 1964. In 1997, the U.S. Department of Transportation issued *DOT Order to Address Environmental Justice in Minority Populations and Low-Income Populations* to summarize and expand upon the requirements of Executive Order 12898 on Environmental Justice. In accordance with the intent of these federal requirements and recent guidance from PAG, analysis was completed to identify protected populations within the study area.

In this analysis, a protected population was identified when the selected population (as a percentage of the total population) within a specific census block group exceeded the average percentage found in either Pima County or eastern Pima County (the lower of the two thresholds). Based on guidance from PAG, analyses were completed for Hispanic, Asian, African American, American Indian, other race, total minority, population over 65 years of age, and population under poverty guidelines as defined by the Census Bureau’s guidance for low income threshold.

The results of this overview indicate that all of the loop study corridors may impact Title VI areas, and the specific impacts would need to be analyzed as further corridor development occurs.

#### 4.3.2 Biological Corridors and Critical Habitat

The inventory of biological corridors and critical habitat of the study area consisted of gathering data and information primarily from the Sonoran Desert Conservation Plan (SDCP). As stated by Pima County, the SDCP designates specific areas for special species management and scientific research. As part of the SDCP, the Conservation Land System includes land categories for multiple use management areas, important riparian areas, and biological core management areas. Currently Pima County roadway projects that could
impact any of the Conservation Land System areas require additional study, review, and mitigation measures as specified in Chapter 4 of the *Pima County Roadway Design Manual*, titled Environmentally Sensitive Roadway Design Guidelines. Both direct and indirect impacts such as the induced effects of the new roadway on habitat and special species are studied. Future roadways that could impact the Conservation Land System and resources identified in the Sonoran Desert Conservation Plan would require additional studies to identify and quantify those impacts, consider various alternatives and alternative alignment, and propose mitigation measures. Pima County would evaluate those studies and make recommendations based on the information learned.

A summary of potential impacts in these areas are summarized in Table 4-8.

### Table 4-8 – Impacts to Biological Corridors and Riparian Areas

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Impacts to Biological Corridors and Riparian Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Impacts Special Species Management Areas, multiple use or recovery management areas and riparian areas.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Impacts biological core, multiple use or recovery management areas and riparian areas.</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Impacts biological core, multiple use or recovery management areas and riparian areas.</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>Impacts riparian areas.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Impacts riparian areas.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Impacts Special Species Management Areas, multiple use or recovery management areas and riparian areas.</td>
</tr>
<tr>
<td>Barraza-Aviation Parkway Extension</td>
<td>No impacts</td>
</tr>
</tbody>
</table>

#### 4.3.3 Agricultural Lands- Ranch Lands

According to the Sonoran Desert Conservation Plan, the conservation of working ranch lands protects vast areas of open space and preserves the heritage and culture of the Southwest. In eastern Pima County, there are approximately 1.4 million acres, presently dedicated to ranching. Virtually all of the larger ranches manage both privately owned and leased public lands. Ranching has been found to be compatible with the goals of the Sonoran Desert Conservation Plan to preserve the integrity of open space and wildlife habitat. The Sonoran Desert Conservation Plan has identified a number of Priority Ranch Conservation Resources.

The results of the review indicate that all of the potential loop routes, with the exception of the Barraza-Aviation Extension and the Kolb/Orange Grove Parkway, may potentially impact ranch lands.
4.3.4 Visual Character

The visual character of the proposed loop study routes varies greatly due to the location of some routes in rural undeveloped areas and others in urbanized areas. Preserving scenic views for both drivers and adjacent residents is a consideration that will need to be addressed during the further development of these loop corridors.

4.3.5 Noxious Weeds

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.

4.3.6 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 United States within a given geographic area, and must receive final approval by the ACOE.

If it is anticipated that work will take place within or adjacent to potential waters of the United States, 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 United States (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 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.

4.3.7 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. Currently Tucson is classified as in attainment for all pollutants. Saguaro National Park is defined as a Class 1 airshed which provides special air quality protection to National Parks. This will need to be considered in future environmental assessments near the Saguaro National Park. Air quality requirements on tribal land are also an issue should the alignments of the Western Freeway Loop or the Southern Freeway Loop impact tribal land. Air quality analyses will be conducted if the Loop Corridors are integrated into the Regional Transportation Plan and when environmental assessments are conducted for individual corridors.

4.3.8 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. Specific requirements for noise mitigation will need to be guided by the requirement of the jurisdiction that the alignment is located in.

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. If potential construction noise impacts are identified, a common sense approach should be utilized to incorporate appropriate abatement measures into the highway project.
4.3.9 Hazardous Materials

Pima County’s geographic information system contains information on the locations of areas where hazardous materials were stored, used, disposed of, transported, or had experienced discharges. Pima County’s GIS database includes several areas of concern, including Superfund Amendments and Reauthorization Act (SARA) Title III sites, landfills (existing and proposed), unlawful open wildcat dumps, and other sites of known contamination.

The area in the vicinity of the Tucson International Airport has a number of Superfund sites, and the graphic shows the associated TCE (trichloroethylene) plume.

Other areas of concern are the several large wildcat dumps and a volatile organic compound area located south of Escalante Road and west of Houghton Road. Several superfund sites and a large volatile organic compound waste area are also present in areas east of I-10 near Ruthrauff Road and La Cholla Boulevard. This is likely related to the high intensity of warehousing and manufacturing in that area.

If a roadway alignment were selected through these areas, additional investigation during the preliminary design stages of the roadway network would be required. It is anticipated that most of these areas could be successfully remediated; however, this remediation effort would probably negatively impact roadway development budgets and schedules. A summary of hazardous material potential impacts are summarized in Table 4-9.
### Table 4-9 – Potential Hazardous Material Impacts by Loop Corridor Route

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Potential Hazardous Material Impacts?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Yes - Trichlorethylene (TCE) plumes, superfund site between Tucson Blvd. and Park Ave.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Yes- Sahuarita Bombing Range</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Yes, there is one Superfund site near Golf Links Road and two Superfund sites near Houghton Road.</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>Yes- Proposed landfills in Sahuarita areas, Sahuarita Bombing Range. Project is in the vicinity of City / County landfill and volatile organic compounds. Superfund sites are located near the west end of the project, and near the River Road /</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Yes, near Kolb Road there are two superfund sites and an area of volatile organic compounds.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Yes, superfund sites are located near the south end of the corridor.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>Yes, a superfund site is located near in the vicinity of the extension</td>
</tr>
</tbody>
</table>

The results of the preliminary review indicated that there is potential hazardous material concerns associated with all the loop corridor routes.
4.3.10 Section 4(f) Resources

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.”

A summary of potential impact to these areas is summarized in Table 4-10. Figure 4-4 provides information on parks, historic districts and national monuments in the study area.

Table 4-10 – Potential 4(f) Resource Impacts by Loop Corridor Route

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Potential Section 4(f) Impacts?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>No anticipated impacts- loop will avoid West Saguaro National Monument and the Ironwood Forest National Forest</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>No anticipated impacts.</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Yes, Houghton Road Golf Course and Golf Links Sports Complex, Southeast Regional Park.</td>
</tr>
<tr>
<td>River/ Alvernon/Swan Parkway</td>
<td>Yes-Tucson Botanical Gardens, Randolph Park, El Montevideo historic district, San Clemente historic district (pending).</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Yes, Ft. Lowell Multiple Resource Historic District.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Yes, possible impact to Rillito River Park, and planned expansion of Tortolita Mountain Park.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>No anticipated impacts</td>
</tr>
</tbody>
</table>

All loop routes with the exception of the Western Freeway Loop, the Southern Freeway Loop and the Barraza- Aviation Parkway extension are anticipated to have Section 4(f) impacts.
Figure 4-4
Parks and Historic Districts

Legend
- Western Freeway Loop
- Southam Freeway Loop
- Houghton / Golf Links Parkway
- River / Alvernon / Swan Parkway
- Kolb / Orange Grove Parkway
- La Cholla Parkway
- Barrera-Aviation Parkway
- Pima County Line
- Freeway
- Other Road
- Historic District
- Wilderness
- Park
- Totolita Mountain Park Expansion
- Ironwood Forest National Monument
4.3.11 Cultural Resources

Certain areas of the PAG region contain historic cultural backgrounds and archeological sites that would require extensive investigation before any proposed roadway corridor be constructed. Three Indian reservations are present within the PAG region: the Pascua Yaqui Indian Reservation, the San Xavier District of the Tohono O’odham Indian Reservation, and the Tohono O’odham Indian Reservation. These Reservations generally extend along significant areas of the Brawley Wash and Santa Cruz River. Any proposed project will be required to consult with and involve the tribal authorities in preliminary investigations to ensure that tribal concerns are thoroughly understood and addressed. The extent of each Reservation is shown in Figure 4-5. Pima County is currently making cultural resource information vague to protect the resources from potential scavenging. Figure 4-5 includes GIS-based information related to Pima County’s archaeologically sensitive areas. This information shows areas of high sensitivity archeological zones, moderately sensitive zones, and low priority areas. Sensitive cultural areas tend to follow watercourses. Typically, the larger the water source (the Santa Cruz River), the larger the area of concern. A summary of potential cultural resource impacts is listed in Table 4-11.

Table 4-11 – Potential Cultural Resource Impacts by Loop Corridor Route

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Potential Cultural Resource Impacts?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Yes - impacts large area of high archaeological sensitivity, impacts Tohono Indian Reservation and Pascua Yaqui Tribe, and impacts areas of historic agricultural land.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Yes- Potential impacts to three areas of high archeological sensitivity and one area of moderate archeological sensitivity, two areas of historic agricultural land, and the San Xavier Indian Reservation</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Yes, impacts areas of high and moderate archeological sensitivity</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>Yes, impacts areas of high and moderate archeological sensitivity, and may have impacts to historic agricultural land on River Road.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Yes, impacts areas of high and moderate archeological sensitivity.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Yes, impacts large area of high archaeological sensitivity, and possibly historic agricultural land near River Road/ Craycroft Road.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>No</td>
</tr>
</tbody>
</table>

To ensure compliance with the National Historic Preservation Act and to prevent the disturbance of historic and/or cultural resources within the study area, 100 percent coverage field surveys and records searches will be required for environmental clearance of proposed roadway construction projects. If cultural resources eligible for listing on the National Register of Historic Places are found in a proposed roadway corridor, additional testing of sites may be required.
Testing will provide the information necessary to fully define and mitigate disturbance to these sites. Consultation with the State Historic Preservation Officer will occur prior to testing and after the testing program is completed to determine if any additional mitigation measures are necessary. It is anticipated that most of these areas could be successfully mitigated; however, testing and mitigation of cultural sites would probably negatively impact roadway development budgets and schedules.

4.3.12 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 4-12. In a number of areas, further environmental investigations would need to be conducted once a more detailed alignment is chosen. A summary of environmental tasks is listed below:

- During the Design Concept Report or Final Design, 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.
- 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 specific 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.
- Cultural resource evaluations will be required for all of the corridors. A Section 4(f) evaluation will be required.
- The CAP right-of-way has already been cleared of cultural resources.
- Consideration of Class 1 airshed designation for Saguaro National Park.
- Consideration of air quality requirements on tribal lands.
- Use environmentally sensitive roadway design to mitigate impacts on all the corridors.
<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Environmental Feasibility Constraints</th>
<th>Environmental Feasibility Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts multiple use management and riparian areas.&lt;br&gt;• May impact individual ranch areas&lt;br&gt;• Potential hazardous material impacts&lt;br&gt;• Potential cultural resource impacts&lt;br&gt;• Consideration of Class 1 airshed designation for Saguaro National Park&lt;br&gt;• Impacts special species management area&lt;br&gt;• Potential 4(f) impacts are not expected since the alignment would not impact the Ironwood Forest National Monument</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts multiple use or recovery management and riparian areas.&lt;br&gt;• Potential impacts to ranch conservation districts&lt;br&gt;• Potential hazardous material impacts&lt;br&gt;• Potential Section 4(f) impacts&lt;br&gt;• Potential cultural resource impacts.&lt;br&gt;• Impacts special species management area</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts multiple use or recovery management and riparian areas.&lt;br&gt;• Potential impacts to ranch conservation districts&lt;br&gt;• Potential hazardous material impacts&lt;br&gt;• Potential Section 4(f) impacts&lt;br&gt;• Potential cultural resource impacts.</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>River/Alvernon/Swan Parkway</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts riparian areas&lt;br&gt;• May impact individual ranch areas&lt;br&gt;• Potential hazardous material impacts&lt;br&gt;• Potential Section 4(f) impacts&lt;br&gt;• Potential cultural resource impacts.</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts riparian areas&lt;br&gt;• Potential hazardous material impacts&lt;br&gt;• Potential Section 4(f) impacts&lt;br&gt;• Potential cultural resource impacts.</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>• Title VI potential impacts&lt;br&gt;• Impacts multiple use or recovery management and riparian areas.&lt;br&gt;• May impact Tortolita Mountain Park ranch area&lt;br&gt;• Potential hazardous material impacts (south end)&lt;br&gt;• Potential Section 4(f) impacts&lt;br&gt;• Potential cultural resource impacts.&lt;br&gt;• Impacts special species management area.</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>• Title VI potential impacts&lt;br&gt;• Potential hazardous material impacts</td>
<td>• Corridor would provide better transportation facilities to minority population groups.&lt;br&gt;• Corridor would provide better access to parks and recreational facilities.</td>
</tr>
</tbody>
</table>
4.4 Land Use and Area Plan Screen

The area plan /community compatibility screen involved two elements: reviewing existing land use to determine what land uses the loop system will affect and assessing whether programmed and planned transportation projects include elements of the loop corridor system, or include transportation projects that support the need–based findings. It should be noted that planned projects may or may not be ultimately constructed.

4.4.1 Land Use Compatibility

**Figure 4-6** shows GIS-based land use categories that were overlaid with the loop study routes. A summary of the land use constraints and opportunities summarized in **Table 4-13**.

**Table 4-13 Existing Land Use Opportunities and Constraints**

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Land Use Opportunities</th>
<th>Land Use Constraints/ Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>• There are vacant land areas in the west area of Tucson, some of which are State Trust Lands.</td>
<td>• Potential impacts to residential land use on Valencia Road and scattered areas of residential development. • Potential impacts to agricultural land use at the north end of corridor.</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>• The west and east segments of the corridor have large areas of vacant land, much of this is State Trust Land.</td>
<td>• Impacts to agricultural and residential land.</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>• The land use at the south end of the corridor on Houghton Road is vacant.</td>
<td>• Impacts to residential and commercial land, Davis-Monthan Air Force Base along Golf Links Road.</td>
</tr>
<tr>
<td>River/Alvernon/Swan Parkway</td>
<td>• The corridor traverses vacant land on the south end the corridor, much of which is State Trust Land.</td>
<td>• Impacts to residential and commercial land uses. • South of Valencia Road, there are impacts to agricultural lands.</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>• Access to Davis–Monthan Air Force Base is already controlled, and would be compatible with a parkway.</td>
<td>• Impacts to residential land uses and commercial land uses within the metropolitan area.</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>• The State Trust Land at the north end of the project is undeveloped, and the road would serve this land.</td>
<td>• Impacts to developed residential and commercial areas throughout the much of the corridor, including La Cholla Airpark.</td>
</tr>
<tr>
<td></td>
<td>• Potential to enhance access to commercial developments.</td>
<td>• Impacts to vacant State Trust Land planned to be used for addition to Tortolita Mountain Park.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>• Vacant land offers opportunities for roadway construction.</td>
<td>• Proximity to Davis-Monthan Air Force Base.</td>
</tr>
</tbody>
</table>

4.4.2 Area Plans

2030 Regional Transportation Plan (Adopted June 2005) - This regional plan addresses transportation facilities and services in eastern Pima County, which includes unincorporated Pima County, the City of Tucson, the City of South Tucson, the Town of Marana, the Town of Oro Valley, the Town of Sahuarita, the Pasqua Yaqui Tribe and the San Xavier District of the Tohono O’odham Nation. The roadway element of the RTP is shown overlaid with the Loop Study corridors in **Figure 4-7**. As the exhibit demonstrates, the loop system
coordinates well with a number of elements of the Regional Transportation Plan. Regional Transportation Authority projects include advance corridor acquisition.

A tabular summary of how the 2030 Regional Transportation Plan supports the need for the loop corridors is provided in Table 4-14.

Table 4-14 – Summary of Regional Transportation Plan

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Projects Included in the Adopted 2030 Regional Transportation Plan that Support the Need for the Loop Study Corridors</th>
</tr>
</thead>
</table>
| Western Freeway Loop          | • SR 989 (Sandario Loop), ROW purchase.  
• SR 910 (north of Ajo Way to I-19), ROW purchase  
• SR 989, Tangerine Road extension (Avra Valley Road to I-10), ROW purchase and construction of two lane roadway.  
• Valencia Road (Houghton Road to SR 86), parkway improvements, RTP includes 4 and 6-lane widening. And access management improvements between I-19 and Alvernon Way |
| Southern Freeway Loop         | • SR 989 (Sandario Loop), ROW purchase.  
• SR 982 (Southeast Area), ROW purchase  
• Kolb Road (I-10 to Old Vail Connection), parkway widening to 4-lanes |
| Houghton/Golf Links Parkway   | • Houghton Road (Snyder Road to Sahuarita Road), parkway widening to 6-lanes from Golf Links to UPRR, 4-lane widening elsewhere. RTP includes new railroad grade separation.  
• Golf Links Road, intersection improvements planned at Swan Road, Wilmot Road, Kolb Road. |
| River/Alvernon/Swan Parkway   | • River Road, 6-lane arterial widening Orange Grove to Campbell Ave., 4-lane arterial widening Campbell Ave. to Sabino Canyon Road  
• Alvernon Way, River to Ft. Lowell, arterial widening to 4-lanes  
• Alvernon Way, Ft. Lowell to Grant, new 4 lanes roadway and bridge/early period  
• Alvernon Way, Ft Lowell to Grant, arterial widening to 6-lanes (medium period)  
• Alvernon Way, intersection improvements at Fort Lowell, Grant Road, 5th Street, Broadway. |
| Kolb/Orange Grove Parkway     | • Orange Grove Road (Thornydale to Corona), arterial widening to 6-lanes  
• Orange Grove Road (Corona to Oracle Road), arterial widening to 4-lanes.  
• Orange Grove Road (Oracle Road to Skyline Drive), arterial widening to 4-lanes.  
• Craycroft Road, River to Sunrise, arterial widening to 4-lanes  
• Kolb Road, intersection improvement at Golf Links Road  
• Valencia Road, Kolb to Houghton, parkway widening to 6-lanes (no grade-separated interchanges) |
| La Cholla Parkway             | • La Cholla Blv, I-10 at Ruthrauff Road to Tangerine, parkway widening to 6-lanes and interchange connection to I-10. |
| Barraza-Aviation Parkway      | • SR 210, Barraza-Aviation Parkway 6-lane extension (Palo Verde to I-10/Vailla Road).  
• SR 210 Extension/Alvernon new traffic interchange / grade-separated interchange  
• SR 210 extension/ Irvinton new traffic interchange  
• I-10/Vailla/Barraza-Aviation traffic interchange construction  
• Golf Links/Barraza/Alvernon traffic interchange reconstruction |

Several presentations were made during the development of the loop study corridors to the Technical Advisory Committee for the Study. The TAC was comprised of representatives from the following agencies and jurisdictions:

- City of Tucson
- Arizona State Land Department
- Pima County Department of Transportation
- Arizona Department of Transportation
- Pasqua Yaqui Tribe
- Town of Marana
- Town of Oro Valley
- San Xavier District of Tohono O’odham Nation
- Tucson Airport Authority
- City of South Tucson
Figure 4-6
Existing Land Use

Legend
- Western Freeway Loop
- Southern Freeway Loop
- Haughton / Golf Links Parkway
- River / Alvernon / Swan Parkway
- Kolb / Orange Grove Parkway
- La Cholla Parkway
- Pima County Line
- Freeway
- Other Road

Land Use
- AGRICULTURE
- COMMERCIAL/OFFICE
- OPEN SPACE/PARK
- INDUSTRIAL
- MILITARY
- RESIDENTIAL
- VACANT
- OTHER

NOTE: LINES SHOWN ARE NOT EXACT LOCATIONS AND ARE SUBJECT TO REFINEMENT

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Regional Transportation Authority Projects

The Regional Transportation Authority (RTA) Plan is a 20-year plan that was approved by Pima County voters in May, 2006. The plan will be paid for by a countywide ½ cent sales tax that will be in effect for 20 years. The plan includes four elements: roadway, transit, safety, and environmental and economic vitality improvements. A tabular summary of how the 2030 Regional Transportation Plan supports the need for the loop corridors is provided in Table 4-15. The RTA Plan includes elements that support the following corridors:

- Western Freeway Loop
- Houghton / Golf Links Parkway
- Kolb Road / Orange Grove Parkway
- La Cholla Parkway
- Barraza – Aviation Parkway Extension

Table 4-15 – Summary of Regional Transportation Authority Projects on the Loop Corridor Routes

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Projects Included in the Regional Transportation Authority Project List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>#21 - Valencia Road, Ajo Way to Mark Road, Widen to a 4-lane desert parkway, bike lanes and sidewalks</td>
</tr>
<tr>
<td></td>
<td>#23 - Valencia Road, I-19 to Alvernon Way, Access management improvements, safety improvements, and intersection improvements.</td>
</tr>
<tr>
<td></td>
<td>#24 – Valencia Road, Alvernon to Kolb Road, Widen to a 6-lane desert parkway, bike lanes and sidewalks.</td>
</tr>
<tr>
<td></td>
<td>#25 - Valencia Road, Kolb to Houghton, Widen to a 6-lane desert parkway, bike lanes and sidewalks</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>None</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>#32 – Houghton Road, I-10 to Tanque Verde: Widen to 4 and 6-lane desert parkway , new bridges (washes and rail), bike lanes and sidewalks.</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>None</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>#25 - Valencia Road, Kolb to Houghton, Widen to a 6-lane desert parkway, bike lanes and sidewalks</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>#4 - La Cholla, Tangerine to Magee, widen to 4-lane desert parkway , bridge over Canada de Oro Wash, bike lanes and drainage</td>
</tr>
<tr>
<td></td>
<td>#10 - La Cholla Boulevard, River Road to Ruthrauff Road, Widen to a 6-lane desert parkway, new bridge at Rillito, bike lanes and sidewalks.</td>
</tr>
<tr>
<td></td>
<td>#89 - Ruthrauff Road at I-10 / RR overpass: railroad and roadway separation to eliminate at-grade crossing.</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>#20 - Barraza / Aviation Parkway, Palo Verde to I-10: Advanced right-of-way funding for future connection of parkway with I-10</td>
</tr>
</tbody>
</table>

Other Plans

The project team reviewed a number of area plan documents to determine if elements of the plans supported any of the corridors. The following reports were reviewed:
In summary, elements of area plans are consistent with the loop corridor system. Primary exceptions are that with respect to the Southern Freeway Loop, The Town of Sahuarita objected to the east-west roadway connection to I-19, using the El Toro Road location. The Town formally asked that PAG evaluate the feasibility of using a location near Pima Mine Road as an alternative to the El Toro location for the east-west connection to I-19. Three I-19 interchange alternatives were developed on or near the Pima Mine Road. While all of the alternatives were found to be possible from a design and construction perspective, no single alternative was endorsed by representatives of both the Town of Sahuarita and the San Xavier District. As a result, additional studies will be required to resolve issues associated with the recommendation for a 300-foot (right-of-way) corridor connecting I-10 to I-19 in the Southeast Area. Further, if it is decided by the State Transportation Board that a corridor connecting I-19 to I-10 in the Southeast Area should be developed as a state highway, additional studies will be required to evaluate alternative corridor alignments, to identify and develop mitigation strategies for environmental impacts, and to obtain environmental clearance in accordance with National Environmental Policy Act (NEPA) policies and procedures. If such a study is conducted, corridors along the El Toro and Pima Mine Road alignments should be considered and evaluated along with other corridor alternatives.

The proposed La Cholla Parkway corridor is not supported by Pima County Administration. The proposed alignment would impact the planned expansion of the Tortolita Mountain Park, as well as impact important cultural and biological resources. Pima County has made expansion of this park a priority through the 2004 General Obligation Bond Program, which allocates approximately $29 million of $174 million toward open space acquisition and/or conservation easements in the Tortolita Mountains area. A letter from Pima County is provided in Appendix B.

Concerns have been expressed by the Tohono O’odham Nation and the Pascua Yaqui Tribe regarding the proximity of the loop corridors to the Nation’s borders. Specifically, it was expressed that any future Los Reales alignment heading west through the San Xavier district would be seriously opposed by the District and the Tohono O’odham Nation, since it would split the San Xavier cooperative farms in half, and impact housing as well.

The Pascua Yaqui Tribe is a major land owner within the Western Freeway Loop Corridor and has requested to be included as a partner in regional planning efforts. A letter from the Pascua Yaqui Tribe is provided in Appendix B.

The Arizona State Land Department in general agrees with the loop concept but remains concerned about roadway impacts. They stated that conceptual plans adopted by the committee should be considered before future alignment recommendations are made, and that consideration should be given to multimodal corridors. A letter from the State Land Department is provided in Appendix B.
5. **Cost Projections**

Loop Study planning-level cost estimates have been developed based on unit cost estimates from a number of sources, including unit costs developed for the Regional Transportation Authority (RTA) *Project Cost Estimation Report* (October, 2005), as well as freeway costs estimated from an Arizona Department of Transportation 2005 audit of freeway costs in Maricopa County.

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

### 5.1 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.

#### 5.1.1 Freeway Costs

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 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. Because of rising construction costs, it was decided to use the higher per lane mile construction cost estimate of $3.78 million per lane mile.

#### 5.1.1 Parkway Costs

Parkway unit construction costs were estimated by reviewing the costs of parkway facilities estimated in the Regional Transportation Authority (RTA) *Project Cost Estimation Report* (October, 2005). Based on similar type facilities, the construction cost per mile was estimated to be $1.92 million per lane-mile for a parkway facility.

An estimate of construction cost for the Loop Study corridors is presented in Table 5-1. The table includes the following elements:

- Construction cost per mile
- Construction contingency (estimated to be 20% of the construction cost)
- Construction Administration Cost (estimated to be 15% of the construction cost)
- Pre-Design studies (estimated to be 5% of the construction cost)
- Design Costs (estimated to be 10% of the construction cost)

The estimated cost of the entire loop system is approximately $6.4 billion dollars in 2005 construction dollars. This cost does not include the cost of right-of-way, which is discussed in the following section.
## Table 5-1 – Cost Projections (Construction Cost Only)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Length in Miles</th>
<th>Construction Cost per Mile (or per interchange)</th>
<th>Construction Cost (Million$)</th>
<th>Construction Contingency (20% of construction cost)(Million$)</th>
<th>Construction Administration (15% of construction cost)(Million$)</th>
<th>Pre-Design Studies (5% of construction cost)(Million$)</th>
<th>Design Costs (10% of construction cost)(Million$)</th>
<th>Total Estimated Cost (Construction only)(Million$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western/Southern Inner Freeway Loop</td>
<td>Freeway 40</td>
<td>4-lanes 31.5</td>
<td>15.1</td>
<td>476.3</td>
<td>95.3</td>
<td>71.4</td>
<td>23.8</td>
<td>714.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-lanes 4.2</td>
<td>27.7</td>
<td>195.3</td>
<td>19.1</td>
<td>14.3</td>
<td>4.8</td>
<td>142.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-lanes 13.3</td>
<td>30.2</td>
<td>402.2</td>
<td>80.4</td>
<td>40.3</td>
<td>20.1</td>
<td>603.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service Interchange 6</td>
<td>15.0</td>
<td>90.0</td>
<td>18.0</td>
<td>13.5</td>
<td>4.5</td>
<td>135.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>System Interchange 3</td>
<td>100.0</td>
<td>300.0</td>
<td>60.0</td>
<td>45.0</td>
<td>15.0</td>
<td>450.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-Design Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,045.6</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Freeway 60</td>
<td>4-lanes 29.6</td>
<td>15.1</td>
<td>447.6</td>
<td>89.5</td>
<td>67.1</td>
<td>22.4</td>
<td>671.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-lanes 9.4</td>
<td>22.7</td>
<td>273.2</td>
<td>42.8</td>
<td>32.0</td>
<td>10.7</td>
<td>319.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-lanes 20.6</td>
<td>30.2</td>
<td>622.9</td>
<td>124.6</td>
<td>93.4</td>
<td>31.1</td>
<td>934.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service Interchange 9</td>
<td>15.0</td>
<td>135.0</td>
<td>27.0</td>
<td>20.3</td>
<td>6.8</td>
<td>202.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>System Interchange 3</td>
<td>100.0</td>
<td>300.0</td>
<td>60.0</td>
<td>45.0</td>
<td>15.0</td>
<td>450.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-Design Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,578.0</td>
</tr>
<tr>
<td>Houghton/Golf Links Pkwy (all 6-lanes)</td>
<td>Parkway 22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>380.2</td>
</tr>
<tr>
<td>River/Alvernon/Swan (all 6-lanes)</td>
<td>Parkway 32.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>561.6</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Parkway 26</td>
<td>4-lanes 12.4</td>
<td>7.7</td>
<td>95.2</td>
<td>19.0</td>
<td>14.3</td>
<td>4.8</td>
<td>142.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-lanes 14</td>
<td>11.5</td>
<td>161.3</td>
<td>32.3</td>
<td>24.2</td>
<td>8.1</td>
<td>241.9</td>
</tr>
<tr>
<td>La Cholla</td>
<td>Parkway 20</td>
<td>4-lanes 10.25</td>
<td>7.7</td>
<td>78.7</td>
<td>15.7</td>
<td>11.8</td>
<td>3.9</td>
<td>118.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6-lanes 9.9</td>
<td>11.5</td>
<td>114.0</td>
<td>22.6</td>
<td>17.1</td>
<td>5.7</td>
<td>171.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-Design Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>289.2</td>
</tr>
<tr>
<td>Barraza-Aviation(new segment) (all 6-lanes)</td>
<td>Parkway 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>148.5</td>
</tr>
<tr>
<td><strong>TOTAL COST</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6,387.8</td>
</tr>
</tbody>
</table>
5.2.2 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. Right-of-way costs for future corridors are nearly impossible to estimate with any degree of certainty. Furthermore, some of the land being considered for the corridor development is within the jurisdiction of Arizona State Land Department which typically auctions land to the highest bidder. Right-of-way costs were estimated by using GIS data on the full assessed property value from the Pima County Assessor’s Office, for parcels along existing corridor segments. These values were averaged, by segment. To be conservative, the highest segment full assessed property value was then used to determine right-of-way costs. In the case of the Western Freeway Loop and the Barraza Aviation Parkway, which are in rural areas, average assessed values were very low, and so higher average right-of-way costs from nearby corridors were used. The assessed values were then divided by a ratio of total assessed value to estimated actual total value of (0.13), which was based on information from the City of Tucson for the last 10 fiscal years (Source: City of Tucson Comprehensive Annual Financial Report, Fiscal Year July 1, 2004-June 30, 2005).

An estimate of probable cost for required right-of-way is presented in Table 5-2. This estimate does not include right-of-way required for system and service interchanges. This cost does not include relocation costs, which may be a significant expense. Depending on the type of property, relocation costs can potentially be as much as right-of-way costs. As Table 5-2 indicates, the relocation cost is unknown, because it is a function of the land use at the time of the purchase.

<table>
<thead>
<tr>
<th>Loop Corridor Name</th>
<th>Total Acres of Right-of-Way Estimated To Be Acquired</th>
<th>Unit Cost / Acre ($)</th>
<th>Relocation Cost</th>
<th>Total Right-of-Way Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>1210</td>
<td>223,000</td>
<td>Unknown</td>
<td>$269,830,000</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>1353</td>
<td>223,000</td>
<td>Unknown</td>
<td>$301,719,000</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>8</td>
<td>346,000</td>
<td>Unknown</td>
<td>$2,768,000</td>
</tr>
<tr>
<td>River /Alvernon/Swan Parkway</td>
<td>39</td>
<td>885,000</td>
<td>Unknown</td>
<td>$34,515,000</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>21</td>
<td>962,000</td>
<td>Unknown</td>
<td>$20,202,000</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>576</td>
<td>615,000</td>
<td>Unknown</td>
<td>$354,240,000</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>245</td>
<td>346,000</td>
<td>Unknown</td>
<td>$84,770,000</td>
</tr>
</tbody>
</table>
6. CONCLUSIONS AND RECOMMENDATIONS

This section discusses the findings of this study and recommends steps and activities that will be required to develop the recommended corridors.

6.1 Conclusions

The following conclusions can be drawn from the information provided in this report:

Loop Study Recommendations in terms of the 2030 Regional Transportation Plan and Regional Transportation Authority

This study acknowledges the current long-range plans in the region, including the 2030 Regional Transportation Plan or the Regional Transportation Authority projects that were approved by voters in 2006. Unlike the 2030 RTP and the RTA’s voter approved projects, both of which have specific time horizons, this study identifies corridors that will meet regional travel needs when the regional population is approximately 2.1 million persons. These study results are to be used to provide general identification of future needs for right-of-way to preserve future transportation corridors.

Corridor Needs for the Beyond 2030 Horizon

As a result of the needs assessment, the following corridors demonstrated a need for a freeway facility:

- Western Freeway Loop
- Southern Freeway Loop

The following facilities demonstrated needs for parkway facilities:

- Houghton/Golf Links Parkway
- River/Alvernon/Swan Parkway
- Kolb/Orange Grove Parkway
- La Cholla Corridor Parkway
- Barraza- Aviation Parkway

Needs were not demonstrated for either freeway or parkway facilities on the following loop system elements. They could, however, be considered as restricted access arterials, although the traffic forecasts suggest they will function acceptably as arterials.

- Tangerine Road
- Houghton Road, north of Golf Links Road
- Ina Road
- Orange Grove Road, west of La Cholla Boulevard
- Snyder Road connection to Houghton Road.

It should be noted that Houghton Road, from I-10 to Tanque Verde, is planned to be widened to a 4 or 6-lane desert parkway, bike lanes and sidewalks. This project was approved by voters in 2006 as part of the RTA Plan. This recommendation does not preclude the need for Houghton Road improvements because the Beyond 2030 analysis assumes other loop corridor facilities will
be built, which may or may not occur. Similarly Tangerine Road, which is planned to be widened as a 4-lane desert parkway from I-10 to La Canada Drive in the RTA Plan, is needed but is not showing heavy future traffic volumes because of other planned roadway facilities.

Corridor Feasibility Analysis

Three feasibility screens were performed for the freeway and parkway corridor: a physical constructability screen, an environmental screen, and a land use / area plan compatibility screen.

The results of these screens showed that all of the corridors have constraints that will need to be addressed in future planning efforts. Those alignments that traverse developed areas will need to address concerns relating to access and right-of-way impacts, particularly on those segments where grade-separated interchanges may be warranted. Table 6-1 summarizes potential impacts regarding feasibility, on a scale from low to high, with “Low” indicating that there appears to be minimal potential impact, which must be reconfirmed through detailed studies, “Medium” indicating that there is likelihood of impacts; further study is needed to determine specific impacts and “High” indicating there is a high likelihood of impacts.
Table 6-1 – Summary of Feasibility Screens

<table>
<thead>
<tr>
<th>Location</th>
<th>Land Use</th>
<th>Utility/Railroad Impacts</th>
<th>Topography</th>
<th>Major Wash Crossings</th>
<th>CAP</th>
<th>Tucson Water Facilities</th>
<th>ROW and Access</th>
<th>Socio-economic Impacts</th>
<th>Biological Corridors /Critical Habitat/Riparian Habitat</th>
<th>Agricultural Lands/Ranch Lands</th>
<th>Hazardous Materials</th>
<th>Section 4(f)</th>
<th>Cultural Resources</th>
<th>Land Use/Area Plan Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Houghton/ Golf Links Parkway</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>River/ Alvernon/Swan Parkway</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Barraza- Aviation Parkway</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

High = there is a high likelihood of impacts  
Medium = there is likelihood of impacts, further study is needed to determine specific impacts  
Low = there appears to be low or minimal potential impact, this must be confirmed through detailed studies.
All of the corridors will have environmental impacts that need to be investigated in greater detail in subsequent phases of project planning and preliminary design. On the corridors that traverse undeveloped areas, environmental impacts relating to impacts to wildlife, ranch lands, and critical habitats are key concerns. The western area in the Avra Valley has extensive Tucson Water recharge facilities and vacant parcels that are planned for future water resource development.

The location of the Central Arizona Project presents both a constraint and an opportunity to develop the Western Freeway Loop. A location near the CAP presents opportunities to locate the roadway near an area that has been cleared environmentally. However there are a number of major water lines that divert the CAP water to recharge areas and to the Tohono O’odham Nation for irrigation purposes that must be bridged or otherwise avoided.

The proposed La Cholla Parkway corridor is not supported by Pima County Administration. The proposed alignment would impact the planned expansion of the Tortolita Mountain Park, as well as impact important cultural and biological resources. There are also potential impacts to the La Cholla Airpark, a private general aviation facility. The La Cholla Parkway also terminates to the north in Pinal County.

Concerns have been expressed by the Tohono O’odham Nation and the Pascua Yaqui Tribe regarding the proximity of the loop corridors to the Nation’s borders. Specifically, it was expressed that any future Los Reales alignment heading west through the San Xavier district would be seriously opposed by the District and the Tohono O’odham Nation, since it would split the San Xavier cooperative farms in half, and impact housing as well. In addition, the Pasqua Yaqui Nation should be consulted for input.

The Arizona State Land Department in general agrees with the loop concept but remains concerned about roadway impacts. They stated that conceptual plans adopted by the committee should be considered before future alignment recommendations are made, and that consideration should be given to multimodal corridors.

With respect to the Southern Freeway Loop, the Town of Sahuarita objected to the east-west roadway connection to I-19, using the El Toro Road location. The Town formally asked that PAG evaluate the feasibility of using a location near Pima Mine Road as an alternative to the El Toro location for the east-west connection to I-19. Three I-19 interchange alternatives were developed on or near the Pima Mine Road. While all of the alternatives were found to be possible from a design and construction perspective, no single alternative was endorsed by representatives of both the Town of Sahuarita and the San Xavier District. As a result, additional studies will be required to resolve issues associated with the recommendation for a 300-foot (right-of-way) corridor connecting I-10 to I-19 in the Southeast Area. Further, if it is decided by the State Transportation Board that a corridor connecting I-19 to I-10 in the Southeast Area should be developed as a state highway, additional studies will be required to evaluate alternative corridor alignments, to identify and develop mitigation strategies for environmental impacts, and to obtain environmental clearance in accordance with National Environmental Policy Act (NEPA) policies and procedures. If such a study is conducted, corridors along the El Toro and Pima Mine Road alignments should be considered and evaluated along with other corridor alternatives.
Project Cost Projections

Project costs (in 2005 dollars) were projected for the corridors as follows:

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Construction Cost (Million $)</th>
<th>ROW Cost (Million $)</th>
<th>Total Cost (Million $)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Freeway Loop</td>
<td>2,046</td>
<td>270</td>
<td>2,316</td>
</tr>
<tr>
<td>Southern Freeway Loop</td>
<td>2,578</td>
<td>302</td>
<td>2,880</td>
</tr>
<tr>
<td>Houghton/Golf Links Parkway</td>
<td>380</td>
<td>3</td>
<td>383</td>
</tr>
<tr>
<td>River/Alvernon/Swan Parkway</td>
<td>561</td>
<td>35</td>
<td>596</td>
</tr>
<tr>
<td>Kolb/Orange Grove Parkway</td>
<td>385</td>
<td>20</td>
<td>405</td>
</tr>
<tr>
<td>La Cholla Parkway</td>
<td>289</td>
<td>354</td>
<td>643</td>
</tr>
<tr>
<td>Barraza- Aviation Parkway Extension</td>
<td>149</td>
<td>85</td>
<td>234</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>$6,388</strong></td>
<td><strong>$1,069</strong></td>
<td><strong>$7,457</strong></td>
</tr>
</tbody>
</table>

*Excluding Relocation Costs

6.2 Recommendations

The recommended Loop Study Corridors are conceptual in nature and will remain conceptual without implementation and involvement from PAG member jurisdictions, PAG and the Regional Transportation Authority. This means that only a general alignment, capacity, and facility type have been considered so far. Some of the higher capacity, limited access roadways shown on the network may be candidates for state route or federal interstate highways and necessitate the involvement of the Arizona Department of Transportation and the Federal Highway Administration. A decision by the Arizona State Transportation Board as to the status of certain loop corridors as a state route or highway may affect the development and funding of the facilities.

Key recommendations are:

1. Integration of Loop Corridors into the Regional Transportation Plan.

The Loop Study Corridors are candidate regionally significant routes and should be considered for inclusion in upcoming Regional Transportation Plans. The results of this study indicate the corridors are needed and are feasible, based on preliminary assessment. Initial planning of new facilities should involve location studies to define specifically the right-of-way width and location legal description, impacts, and design for the routes. Other aspects of project development include planning to transition existing roadway facilities from facilities that have unconstrained access to adjacent property to facilities with a high level of access control that accommodate a higher number of through trips.

For example, parkways transitioning to GSIs should be considered when specific traffic volume “triggers” occur. Previous research\(^2\) shows that a grade-separated intersection is warranted by a total approach volume of 85,000 vehicles per day or if the approach volumes exceed the capacity of at-grade intersections. Other general development considerations for a grade-separated intersection are provided in the report *Transportation Access Management Guidelines for the City of Tucson* (May 2003), among many other regional and national publications. Another programming consideration may be to designate new parkway facilities as scenic routes to assure that appropriate design guidelines are followed for both the roadway and adjoining land development.

\(^2\) *Orange Grove Road / Oracle Road Intersection Demonstration Project, Final Study Report, Volume 1 (JHK & Associates, May 1991).*
2. Once Loop Study Corridors are included in the Regional Transportation Plan, incorporate Corridors into a Major Streets and Routes Plan.

A primary tool for corridor preservation is a Major Streets and Routes Plan (MSR). Pima County and the City of Tucson have already adopted MSRs which are updated periodically. The City of Tucson routinely follows the intent of the Pima County MSR as they annex unincorporated areas. The Town of Marana has a Major Route Right of Way Plan. Corridors that follow a section line can be added into existing transportation plans of the local jurisdictions or adopted formally, and placed on an existing MSR plan.

For those corridors not on a section line, additional planning and location studies are needed to help create a legal description of the corridor. This can occur prior to inclusion on the MSR, but also can happen afterwards. The benefit of early inclusion is the public notice of intent to obtain right-of-way; the disadvantage is the precise location is unknown, which complicates land development and investment decisions. It should be noted that more right-of-way is typically needed near major intersections to accommodate additional through lanes and turn lanes, bus stops, and in some locations, for grade separation structures.

3. As the MSR Plan is Prepared, Integrate with Adopted Land Use Plans

All of the local jurisdictions in Arizona plan for future growth through general plans (municipalities) and comprehensive plans (counties.) The plans include land use and circulation elements, among many other infrastructure, physical, and policy elements of importance. The land use plans are then implemented through the jurisdictions’ zoning code and development procedures; the transportation plans are implemented through both the land development process and the Capital Improvement Plan. Although the nuances differ from agency-to-agency, they all follow the same basic statutory requirements, including Arizona’s Growing Smarter legislation.

Land development is driven by many factors, such as the perceived marketplace and by the availability of infrastructure to support development. Developers rely heavily on approved plans and programs -- including the land use, circulation plans, and MSRs -- to base their investment decisions. It is therefore imperative that the recommendations of this study be further integrated into the local jurisdiction’s overriding plans and programs. This will require the jurisdictions to formally amend their land use and circulation elements; to update any affected area and neighborhood plans; to potentially modify their zoning codes and development procedures; and to incorporate the corridors into their capital improvement programs.

4. Consider Development of a Dedicated Funding Source for Future Funding of Loop Study Corridors.

Future roadway improvements for the “beyond 2030” scenario will require new revenue sources dedicated to their implementation.

5. Funding Strategies

The estimated implementation costs include $1.1 billion for right-of-way and $6.6 billion for construction. Relocation costs were not estimated but will increase this number. None of these costs are included in currently-adopted plans, and therefore no money is earmarked for these new corridors. If the region’s leadership decides to implement the findings of this study, they will also need to define and commit additional funds for the following activities, among others:
- Corridor network prioritization, route designation, implementation concepts, and phasing studies
- Corridor location, right-of-way, and mitigation studies
- Public involvement and business participation through all planning, design, and construction phases
- Advanced corridor right-of-way acquisition
- Detailed project planning, operational analysis, and preliminary design
- Final design and construction drawings
- Corridor construction and impact mitigation
- Ongoing operation and maintenance activities for new facilities

Funding options fall into three general categories, public, private, and public/private partnerships. In Arizona, federal and state funds have been the primary revenue source for most major roadway projects. Some local revenues have also been used.

Public funding will likely provide most of the revenues to implement the findings of this study. The major federal source is allocated by Congress through national transportation legislation. The current legislation, titled Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (or SAFTEA-LU), employs numerous funding categories that are distributed mainly by formula. Congress can also earmark funding for special projects, and has regularly done so. Federal funds are derived from the national gas tax and similar taxes and fees.

State funds rely mainly on the Highway User Revenue Fund (HURF), which currently totals about $1.3 billion per year. Just over half of the fund is allocated to ADOT, and the remainder is split among the municipalities and counties within the state. HURF has not kept pace with inflation and is inadequate to meet the needs of a rapidly growing state with deteriorating roadways. The PAG region currently receives about $98 million total Federal, State funds, which is roughly proportional to the region’s population compared with the state population.

On May 16, 2006, Pima County voters approved a ½-cent sales tax for transportation projects and transit services. The tax will generate about $2.1 billion over twenty years, and all of this money is committed to the approved project list. Due to the inadequacy of federal and state funding, local jurisdictions also collect additional construction sales taxes and impose development impact fees that are dedicated to near-term improvements to area roadways. These funds are also committed to approved projects.

Private funding sources include development exactions for right-of-way, fees in-lieu of certain public roadway improvements, and construction of major arterial roadway segments crucial to new development. No freeways or other major arterials have been built in the PAG region by the private sector, although there are several examples in the MAG region.

Public-private partnerships have been used throughout the US and other countries to fund, construct, and operate major corridors. Partnerships can simply be a mix of public and private funds building a traditional project, or they can build a revenue generating corridor such as a toll road. Both of these concepts have some potential for implementing the study corridors. State law already allows tolls roads, although none currently exist in the state. Chapter 22 of Title 28 of the Arizona Revised Statutes describes requirements for transportation project privatization. With respect to toll facilities, ARS 28-7702, Transportation Facility Requirements states that the State Transportation board shall approve a toll facility only if a reasonable alternative route exists. The statute also requires that the facility accommodate the same type of facility as the existing alternative facility and
provide a route that is at least as direct as the existing alternative facility. California and Colorado already have operating toll facilities. For example projects, see http://www.tcagencies.com/home/index.htm for information of California’s routes and toll structure.

* Bonds and infrastructure bank loans* are not revenue sources, *per se*, but they can be used to advance projects using current or anticipated funding sources. Revenue bonds are repaid using income generated by a project (such as tolls or user fees), whereas general obligation bonds are retired using a general tax base. Infrastructure banks provide low cost construction loans based on seed money created with public funds and repaid with routine transportation revenues such as HURF.

*Funding sources with the highest potential* are likely to be toll roads; regional impact fees; state or federal funding via route transfer; and commitment of a second 20-year RTA ½ cent sales tax towards for these corridors. This short list is not mutually exclusive, meaning that one or all of the sources could be used strategically.

### 6. Implementation Strategies

Implementing any or all of the these corridors will require an extremely long lead time, perhaps as long as 30 - 50 years to plan, fund, design and build. However, that does not mean work on the projects can wait. Instead, if the corridors are approved for implementation, work will need to begin immediately on the initial project phases.

In addition to plan integration and project funding described above, the region can consider two other useful strategies. The first strategy is identifying an appropriate steward for implementing this interconnected Loop system. There are three obvious choices to consider: PAG, the RTA, and ADOT. A fourth choice would be a new entity, perhaps a separate district created by state statute. The RTA may be the most logical choice since it is regional in scope and already has some funding and project commitment. However, this needs to be resolved through a logical decision process and public discussion.

The second strategy is instituting a *project programming continuum* that links all of the phases of corridor development from concept to construction. Under this concept, a long term master plan clearly integrates and programs distinct phases that are otherwise separated. This differs from today’s process of separately programming the project’s planning, design, and construction activities. Essentially, this concept creates a master plan and schedule for each corridor (versus each phase of each corridor), and all of the master plans are cross-correlated. The goal is simply to keep each corridor active and ongoing, rather than intermittent, or even worse—neglected. This project programming continuum should include development of design standards for each corridor, to assist in obtaining concurrence and public review.

### 7. Prioritize the Acquisition of Right-of-Way for the Recommended Improvements

Prioritizing the acquisition of right-of-way for the recommended improvements would help preserve the routes, minimize the cost of developing the roadways, and help control access to the roadways.

### 8. Develop Regional and Jurisdictional Development Policies for Limiting Access from Developments that are Built Before the Limited Access Roadway Can Be Completed

It is recommended that regional and jurisdictional development policies be implemented in order to limit access to future planned limited access facilities. The City of Tucson has
developed some policies for roadways such as Houghton Road, where development is currently taking place before a planned limited access roadway can be constructed. These policies allow the developments to access the roadway during the interim period, but require the future access to the development to conform to the access restrictions required for a limited access roadway in the future. These types of development policies will be essential to successful implementation of these limited access roadways.
EXECUTIVE SUMMARY

The principal purpose of the PAG State Transportation System Mobility and Regional Circulation Needs Feasibility Study (Loop Road Study) is to evaluate the need for, and feasibility of, developing a system of limited, controlled, and reduced access roadways in the PAG Region. The purpose of this aspect of the study was to provide information on the criteria and process to designate a route as a State Highway and to assess whether selected special focus corridors are justified for inclusion on the State Highway system. The assessment was based on criteria developed from State Transportation Board policies, the Arizona Revised Statutes, and the Arizona Department of Transportation (ADOT) Route Transfer and Level of Development Study (2004). Eleven criteria were developed and applied to each of the special focus corridors.

Similar studies, referred to as Corridor Definition Studies, are underway by the Arizona Department of Transportation (ADOT) in Pinal County. The outcome of the ADOT studies in Pinal County may provide further insights to the recommendations contained in this Executive Summary.

Based on direction from the Pima Association of Governments special focus corridors were defined for this study, and are shown in Exhibit S-1. These corridors are defined as follows:

1. Tangerine Road (I-10 to SR 77) either connecting directly to I-10 or with an alternative connection to I-10 via Camino De Manana.
2. Sahuarita Corridor, consisting of a new limited access facility on the El Toro Road alignment, turning north to a Wilmot Road/Kolb Road alignment, which extends north to the I-10/Kolb Road interchange. This alignment includes an east-west extension along Andrade Road from Wilmot Road to I-10 in the vicinity of SR 83. The definition of this corridor is consistent with the draft recommendations of the PAG Southeast Area Arterial Study. The Sahuarita Mayor and Council has requested that the Pima Mine Road alignment be considered as an alternative to El Toro Road.
3. Loop Corridor consisting of Houghton Road, Golf Links Road, Alvernon Way, and Swan Road. (The Sahuarita Corridor “closes” this loop).
4. Barraza-Aviation Parkway Extension (Golf Links Road to I-10/Valencia Road)

A summary of how each route meets the state highway criteria is summarized in Exhibit S-2.

The following recommendations are made regarding advancement of discussions with the State Transportation Board on the designation of special focus corridors as state highways.

1. Discuss the contents of this Working Paper with representatives of the ADOT Transportation Planning Division and the ADOT Tucson District staff to determine the view of ADOT with respect to advancing a recommendation to the State Transportation Board regarding State Highway designation, and to discuss funding and programming issues. Key elements of ARS 28-7041 include the requirement that a road must be recommended to the Board by the ADOT Director of Transportation to be designated a state highway. Additionally, per ARS 28-7043, 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 State Transportation Board as a state highway, the department (ADOT) shall maintain the highway. For these reasons, ADOT Planning Division participation is essential.

PAG State Transportation System Mobility and Regional Circulation Needs Feasibility Study, Final Working Paper 2, March 2006
2. Discuss the contents of this paper with the Tucson Representative to the State Transportation Board to determine the process to designate, approve, fund and program new state highways into the State Highway System.

3. Discuss the contents of this paper with the affected jurisdictions who are currently maintaining the affected roadways. Statutory law (ARS 28-7043) requires that at least two weeks before the designation and acceptance by the State Transportation Board of a state route or portion of a state route as a state highway, the State 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. The county can appear before the board or petition the board to take over and designate a state highway. Therefore, local coordination is also a critical component of the designation process.

**Exhibit S-1 Special Focus Corridors**

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*PAG State Transportation System Mobility and Regional Circulation Needs Feasibility Study, Final Working Paper 2, March 2006*
### Exhibit 6 – Summary of State Route Criteria Compliance

<table>
<thead>
<tr>
<th>Criteria for State Highway Designation</th>
<th>Tangerine Road, I-10 to SR 77 with Direct Connection to I-10</th>
<th>Tangerine Road, I-10 to SR 77 with Direct Connection to Camino de Manana</th>
<th>East-West Alignment, Via El Toro Road / Andrade Road</th>
<th>North-South Alignment via Willcox Road / Koob Road</th>
<th>Houghton Road, Golf Links Road, Andrade</th>
<th>Golf Links Road, Aviation Parkway to Houghton Road</th>
<th>Alvarado Way / DeAnza Road, Aviation Parkway to El Toro Rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has this road been designated as a state route?</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
</tr>
<tr>
<td>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?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Is this route primarily designed to carry through traffic?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Does this route connect urban to rural population centers?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Does this route interconnect with those of other states?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6. Is this route a high capacity connecting route needed to form an efficient network?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Does this route provide statewide and regional movement of people and goods?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>8. Is this route designated as an Interstate Highway or Urban Freeway?</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
</tr>
<tr>
<td>9. Does this route meet criteria for “other major facilities” including:</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Rural arterial and major collector routes with more than 1,000 ADT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Urban arterial routes with more than 1,000 ADT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Freeway routes necessary to form an efficient network in which all routes are either Freeway, Urban Freeway, or Major Freeway (certain routes)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>10. Does this route meet criteria for “other statewide routes” including:</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Rural arterial and major collector routes with more than 1,000 ADT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Urban arterial routes with more than 1,000 ADT</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Freeway routes necessary to form a network in which all routes are either Freeway, Urban Freeway, or Major Freeway (certain routes)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>11. Does this route meet criteria for “non-statewide routes” serving points of state and national interest?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Total Number of Criteria Fully Met:** 10

---

P-AG State Transportation System Mobility and Regional Circulation Needs Feasibility Study, Final Working Paper 2, March 2006
State Transportation System Mobility and Regional Circulation Needs Feasibility Study
Final Working Paper 2
Assessment of Selected Loop Routes for Designation as State Highways
Pima Association of Governments: 
State Transportation System Mobility and Regional Circulation Needs Feasibility Study 
(Loop Road Study)

FINAL
Working Paper 2
Assessment of Selected Loop Routes
for Designation as State Highways
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<th>Page</th>
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1.0 Study Background and Purpose

1.1 Study Background

In January 1986, the State Transportation Board passed right-of-way resolutions designating nine roadways and corridors in the Pima Association of Government (PAG) region as State Routes. The State Route designation is used by the State Transportation Board to designate both existing rights-of-way and potential new corridors for future construction as State Highways. Construction and maintenance of State Routes are the responsibility of local jurisdictions until such time as they are designated as State Highways by the State Transportation Board.

Four of the nine State Routes were identified by the State Transportation Board as priority corridors and commitments were made to partner with PAG and its member jurisdictions on funding corridor development. The priority corridors were:

- Tangerine Road (SR 989)
- Golf Links Extension (SR 810)
- Sahuarita Corridor (SR 982)
- Houghton Road (SR 983)

The adopted 1986 PAG Regional Transportation Plan (RTP) included all nine State Routes and relied heavily on the priority corridors to meet the Region’s 20-year transportation needs. The State Routes made up a significant portion of the 80 miles of new controlled access roadways and 22 miles of new arterial roadways that were recommended in the 1986 RTP. The current 2030 Regional Transportation Plan incorporates improvements to all of these corridors.

Past funding of the priority corridors has resulted in corridor improvement plans and environmental analyses for the Sahuarita Corridor, Tangerine Road, and Houghton Road. Additionally, Golf Links Road, another priority corridor, was extended east to Houghton Road using local funds. However, shortfalls in local and state funding and jurisdictional differences on corridor improvement plans have significantly limited the development of other State Routes.

In an attempt to facilitate development of the Region’s priority corridors and to address an identified lack of State Highways in the PAG Region, six jurisdictions in the PAG Region asked the State Transportation Board to take three corridors into the State Highway System. In a November 2003 letter to the State Transportation Board, the following three corridors were requested for designation as State Highways.

- Sahuarita Corridor between I-19 and I-10
- A Loop Corridor consisting of Houghton Road, Golf Links, Alvernon Way, Swan Road, and Sahuarita Corridor
- Tangerine Road Corridor between I-10 and SR 77

These three corridors, when combined with the transportation system included in the 1986 RTP, make up a majority of the corridors that will be evaluated in this study – the PAG State Transportation Mobility and Regional Circulation Needs Feasibility Study (Loop Road Study). This renewed interest in the development of a loop system along with the passing of House Bill 2507 (the PAG Regional
Transportation Authority) has given PAG an opportunity to consider the need for and feasibility of reestablishing a high capacity framework for the Region’s transportation system.

1.2 Study Purpose

The principal purpose of the PAG Loop Road Study is to evaluate the need for, and feasibility of, developing a system of limited, controlled, and reduced access roadways in the PAG Region. The successful completion of this study will result in the following regional transportation goals being met:

- A traffic circulation and access framework for future planning efforts in the study area;
- Identification of transportation corridors in advance of land use development to meet future mobility and regional bypass needs in future growth areas of the Region;
- Preservation of corridors and establishment of land use controls in the emerging and fringe areas of the Region;
- Extension of the functional and operational life-cycle of existing arterials, collectors, and local streets in developed areas by providing opportunities for diverting regional traffic to regional routes;
- Study area transportation network being reflected in the PAG travel demand model;
- A basis for prioritizing and programming transportation infrastructure construction within the study area; and
- A foundation for a public/private partnership in the funding of transportation infrastructure in the study area.

1.3 Overview of Working Paper 2

Based on direction from the Pima Association of Governments special focus corridors were defined for this study, and are shown in Exhibit 1. These corridors are defined as follows:

1. Tangerine Road (I-10 to SR 77) either connecting directly to I-10 or with an alternative connection to I-10 via Camino De Manana.
2. Sahuarita Corridor, consisting of a new limited access facility on the El Toro Road alignment, turning north to a Wilmot Road/Kolb Road alignment, which extends north to the I-10/Kolb Road interchange. This alignment includes an east-west extension along Andrada Road from Wilmot Road to I-10 in the vicinity of SR 83. The definition of this corridor is consistent with the draft recommendations of the PAG Southeast Area Arterial Study.
3. Loop Corridor consisting of Houghton Road, Golf Links Road, Alvernon Way, and Swan Road. (The Sahuarita Corridor “closes” this loop).
4. Barraza-Aviation Parkway Extension (Golf Links Road to I-10/Valencia Road)

The purpose of this working paper is to provide information on the criteria and process to designate a route as a State Highway and to assess whether these special focus corridors are justified for inclusion on the State Highway system. This information is presented to PAG for further discussions with ADOT and possible distribution to the State Transportation Board for a decision on whether to designate any or all of these routes as State Highways. The assessment was based on criteria developed from State Transportation Board policies, the Arizona Revised Statutes, and the Arizona Department of Transportation (ADOT) Route Transfer and Level of Development Study (2004).
Exhibit 1 Special Focus Corridors

LOOP SYSTEM CORRIDORS
- Tangerine Road Corridor (with optional Camino de Manana connection to I-10)
- Sahuarita Corridor
- Golf Links/Haughton Road/Averman Way/Swan Road Corridor
- Barraza Aviation Parkway Extension to I-10
1.4 Background Information on Current Route Classifications and Growth Areas

Resources to assist in assessing the special focus corridors for suitability as possible state highway facilities are provided in the following three exhibits. Exhibit 2 provides a summary of the state route designations in the Tucson area. Exhibit 3 provides reference information on future growth areas, based on information provided in the PAG Draft 2030 Regional Transportation Plan. These growth areas are referred to in Chapter 3 to evaluate whether a route serves a population center. Exhibit 4 provides a graphic depiction of current state highways, state routes, and National Highway System routes.

Exhibit 2 - State Route System Inventory - PAG Region

<table>
<thead>
<tr>
<th>No.</th>
<th>Route</th>
<th>Description</th>
<th>Resolution</th>
<th>Date</th>
<th>Designated State Highway?</th>
<th>Did Resolution note facility as part of PAG Freeway/Expressway System?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SR 983</td>
<td>Houghton Rd. Sahuarita Rd. north to Golf Links</td>
<td>86-01-A-07</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>SR 210* and SR 810</td>
<td>Aviation Corridor I-10 at St. Mary’s east to Alvernon Way and Golf Links Corridor (Alvernon to Pantano Parkway)</td>
<td>82-03-A-17</td>
<td>4/16/1982</td>
<td>Yes, Aviation (Broadway to Alvernon Way)**</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>SR 489</td>
<td>Alvernon Way Valencia Rd. north to Grant Rd.</td>
<td>86-01-A-05</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>SR 910</td>
<td>Valencia Extension - East Kolb Rd. east to Houghton Rd.</td>
<td>86-01-A-12</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>SR 989</td>
<td>Sandario/San Joaquin Highway SR 86 north to I-10 via Manville Rd.</td>
<td>86-01-A-09</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>SR 989</td>
<td>Tangerine Rd. Highway First Ave. east to SR 77</td>
<td>91-09-A-73</td>
<td>9/20/1991</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>SR 989</td>
<td>Tangerine Rd. Highway</td>
<td>86-01-A-10</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>SR 110</td>
<td>Kolb-Grant Loop Corridor I-10 east to Kolb Rd. south on Kolb to I-10</td>
<td>81-11-A-47</td>
<td>11/20/1981</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>SR 910</td>
<td>Valencia - Bilby Corridor I-19 east to I-10</td>
<td>81-11-A-47</td>
<td>11/20/1981</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>SR 589</td>
<td>Campbell Ave. / Kino Highway Valencia Rd. north to Grant Ave.</td>
<td>86-01-A-06</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>SR 982</td>
<td>Sahuarita Rd. Highway I-19 east to I-10</td>
<td>86-01-A-08</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>SR 810</td>
<td>Golf Links Extension Highway Camino Seco east to Houghton Rd.</td>
<td>86-01-A-11</td>
<td>1/20/1986</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>SR 210</td>
<td>Aviation Corridor I-10 to Golf Links Rd.</td>
<td>83-03-A-09</td>
<td>2/18/1983</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Resolution defined SR 210 as State Route - existing State Route includes St. Mary’s Road east to Broadway Blvd only.
**Not designated a state highway via this resolution.

Source: ADOT Engineering District II, Pima County, Arizona
Exhibit 3 Regional Growth Areas, 2000-2030
Exhibit 4  Existing National Highway, State Highway, and State Route Systems
2.0 Review of State Statutes, Policies, and System Criteria Regarding State Highway Criteria

This section discusses criteria to use in defining routes that may qualify for consideration of inclusion on the state highway system through a route transfer. It discusses relevant state statutes, State Transportation Board (Board) policies, and state highway classification criteria contained in the ADOT Route Transfer and Level of Development Study (2004). Since criteria for designating routes as State Highways does not exist per se, the criteria presented below is an interpretation of general information relating to the function of the State Highway System.

2.1 Arizona Revised Statutes

2.1.1 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 it’s entirety below 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.

2.1.2 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.

2.1.3 Process of Designating a State Highway

The process of converting 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 conversion of a 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.
2.2 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 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."

2.3 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 for the Arizona Department of Transportation. As part of this study, criteria for inclusion of a road on the state highway system was developed for functional categories of state highways. These criteria are summarized in Exhibit 5.

Exhibit 5 State Highway Criteria from Route Transfer and Level of Development Study

<table>
<thead>
<tr>
<th>Facility</th>
<th>Definition</th>
<th>Classification Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeways</td>
<td>Interstate and urban controlled access facilities designed for high volume, high speed and full access control.</td>
<td>▪ Designated as Interstate Highway or Urban freeway</td>
</tr>
<tr>
<td>Other Major Facilities</td>
<td>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.</td>
<td>▪ Rural routes with more than 5,000 ADT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Connecting rural National Highway System (NHS) routes with more than 1,500 ADT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Key freight routes (more than 1,000 articulated trucks per day)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ 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</td>
</tr>
<tr>
<td>Other Statewide Routes</td>
<td>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.</td>
<td>▪ Rural arterial and major collector routes with more than 1,500 ADT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Urban arterial routes with more than 5,000 ADT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Connecting routes necessary to form a network in which all other statewide routes connect with Freeways, other major facilities or other statewide routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Not including business routes and other routes with parallel state highways of higher classification</td>
</tr>
<tr>
<td>Non-statewide routes</td>
<td>Lower volume rural routes connecting facilities or regions of statewide significance. These routes are expected to stay on the state system</td>
<td>▪ Routes that would normally be classified as a route without statewide significance but serves a state or national facility</td>
</tr>
<tr>
<td>serving points of state and National interest</td>
<td></td>
<td>▪ Provide only access to a large population or</td>
</tr>
</tbody>
</table>
Facility | Definition | Classification Criteria
---|---|---
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. | land area. |

Source: *Route Transfer and Level of Development Study*, HDR, 2004

### 2.4. Summary of State Highway Designation Criteria

Based on the policies and criteria discussed earlier in this chapter, a list of state highway criteria was developed to measure against the characteristics of the special focus corridors in order to determine if they might be eligible for state highway designation. It is not necessary to respond “yes” to every criteria in order to be a successful state highway. Any route that meets a preponderance of the criteria may be suitable.

These criteria can be expressed by the following questions:

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)*

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).*

3. Is this route primarily designed to carry through traffic? *(Per State Transportation Board Policy No. 5).*

4. Does this route connect Arizona’s population centers? *(State Transportation Board Policy No. 5)*

5. Does this route interconnect with those of other states? *(State Transportation Board Policy No. 5)*

6. Is this route a high capacity connecting route needed to form an efficient network? *(State Transportation Board Policy No. 5)*

7. Does this route provide statewide and regional movement of people and goods? *(State Transportation Board Policy No. 16)*

8. Is this route designated as Interstate Highway or Urban freeway? *(Per *Route Transfer and Level of Development Study*).*

9. Does this route meet criteria for “other major facilities” including *(Per *Route Transfer and Level of Development Study*).*
- 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

10. Does this route meet criteria for “other statewide routes” including (Per Route Transfer and Level of Development Study).

- 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

11. Does this route meet criteria for “non-statewide routes” serving points of state and national interest. (Per Route Transfer and Level of Development Study).
3.0 Assessment of Special Focus Corridors

This chapter provides an assessment of each of the special focus corridors to determine if the corridor, or corridor segments, meets the criteria for a state highway designation. All of the special focus corridors were modeled individually as access-controlled parkways, using future (2030) land use and population projections. This is referred to as the “Special Loop 2030 Model” in the sections that follow.

3.1 Tangerine Road, I-10 to SR 77

Tangerine Road is a two-lane facility, which currently (2005) carries between 6,600 and 14,600 vehicles per day (vpd). Tangerine Road is already designated as a state highway between Oracle Road (SR 77) and First Avenue. This section is currently under construction by ADOT to be widened to a four-lane section. Tangerine Road, from First Avenue to La Canada Drive, in Oro Valley has been widened to a four-lane section. According to the 2030 Regional Transportation Plan (RTP), Tangerine Road is planned to be widened to a four-lane facility between La Canada Drive to I-10. Future (2030) traffic projections, based on the RTP, can be summarized as follows:

<table>
<thead>
<tr>
<th>Section</th>
<th>Traffic Volume (vpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR 77 to Rancho Vistoso Blvd. /First Avenue</td>
<td>20,000 vpd</td>
</tr>
<tr>
<td>Rancho Vistoso Blvd. /First Avenue to La Cholla Blvd</td>
<td>28,000 vpd</td>
</tr>
<tr>
<td>La Cholla Blvd to Thornydale Boulevard</td>
<td>42,000 vpd</td>
</tr>
<tr>
<td>Thornydale Boulevard to Tortolita Road</td>
<td>25,200 vpd</td>
</tr>
<tr>
<td>Tortolita Road to I-10</td>
<td>30,400 vpd</td>
</tr>
<tr>
<td>Tangerine Road to Camino de Manana</td>
<td>9,600 vpd</td>
</tr>
<tr>
<td>Camino de Manana to Tortolita Road to I-10</td>
<td>17,100 vpd</td>
</tr>
</tbody>
</table>

Two alternatives for this corridor were modeled: one showing Tangerine Road with a direct connection to I-10, and one with a limited access connection to Camino de Manana, which would link to the programmed I-10 / Twin Peaks Road interchange. The Camino de Manana alternative would connect to Tangerine Road using the Tortolita Road alignment, then transition to Camino de Manana.

3.1.1 Tangerine Road Corridor with Direct Connection to I-10

In this alternative, Tangerine Road was improved along current alignment with a direct connection to I-10 via the Tangerine Road interchange.

A comparison of forecast 2030 traffic volumes for the base RTP network and the access controlled configuration can be summarized as follows:
<table>
<thead>
<tr>
<th>Road Segment</th>
<th>PAG 2030 RTP Volumes (vehicles per day)</th>
<th>Special Loop 2030 Model (vehicles per day)</th>
<th>Change in traffic volume (vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangerine Road</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 77 to Rancho Vistoso Blvd/First Avenue</td>
<td>20,000</td>
<td>44,000</td>
<td>+24,000</td>
</tr>
<tr>
<td>Rancho Vistoso Blvd/First Avenue to La Cholla Blvd.</td>
<td>28,000</td>
<td>71,700</td>
<td>+43,700</td>
</tr>
<tr>
<td>La Cholla Blvd. to Thornydale Road</td>
<td>42,000</td>
<td>66,200</td>
<td>+24,200</td>
</tr>
<tr>
<td>Thornydale Blvd to Tortolita Road</td>
<td>25,200</td>
<td>46,900</td>
<td>+21,700</td>
</tr>
<tr>
<td>Tortolita Road to I-10</td>
<td>30,400</td>
<td>48,800</td>
<td>+18,400</td>
</tr>
<tr>
<td><strong>Tortolita Road, Tangerine to Camino De Manana</strong></td>
<td>9,600</td>
<td>5,700</td>
<td>-3,900</td>
</tr>
<tr>
<td><strong>Camino de Manana, Tortolita Road to I-10</strong></td>
<td>17,100</td>
<td>12,845</td>
<td>-4,255</td>
</tr>
</tbody>
</table>

The model results from the Special Loop 2030 Model indicate that Tangerine Road traffic grew by 58% to 156% as an access controlled facility.

Analysis indicates that approximately 15,000 vehicles per day would be through trips between I-10 and Oracle Road (SR 77). This indicates that the corridor will carry approximately 19% to 38% through trips as a six-lane access controlled facility in 2030.

A brief evaluation of the state highway criteria for Tangerine Road as an access controlled parkway is summarized as follows:

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)
   Yes, Tangerine Road was designated as State Route 989. Resolution 86-01-A-10 (1/20/86) designated Tangerine Road from I-10 to US 89 (now SR 77) as a state route. This resolution also notes that PAG had adopted and approved the expansion of the *PAG Regional Freeway/Expressway Plan* to include this route. Resolution 91-09-A-73 (9/20/91) established Tangerine Road from First Avenue (in Oro Valley) to US 89 (now SR 77) as a state highway.

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, Tangerine Road connects I-10 (a state highway) and SR 77 (a state highway) through the Towns of Marana and Oro Valley. The location of this corridor makes it a good candidate for a continuous east-west access controlled roadway in the northern part of the Tucson region. This route provides for growing travel between Oracle Road and I-10, and is a major corridor for travel from southern Pinal County to access I-10. Large housing developments are being approved for construction in the Oracle...
Road corridor north of Tangerine, in Pima and Pinal counties, which will increase demand for this connection significantly.

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5).
   Yes. If Tangerine Road is improved to an access controlled facility, modeling for 2030 conditions indicates that this route will carry approximately 15,000 vehicle trips per day between I-10 and SR 77.

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)
   Yes, Tangerine Road connects the Towns of Marana and Oro Valley. It also provides access to the population centers of Saddlebrooke, the Town of Catalina, and other existing or planned developments in Pinal County. Additionally, this roadway has been identified as the northern segment of a future loop system connecting through Marana to the Avra Valley / Sandario corridor.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
   No, Tangerine Road 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, it would provide the only access controlled east-west facility in the northern area of Tucson.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)
   Yes, this facility would provide regional movement of people and goods by providing a regional route connecting from I-10 to SR 77 and SR 79.

8. Is this route designated as an Interstate Highway or Urban freeway (per Route Transfer and Level of Development Study)?
   Yes, as mentioned in Criteria 1, Resolution 86-01-A-10 (1/20/86) designated Tangerine Road from I-10 to US 89 (now SR 77) as a state route. It also noted that PAG adopted and approved the expansion of the PAG Regional Freeway/Expressway Plan to include this route, indicating it is part of the PAG urban freeway system. Resolution 91-09-A-73 (9/20/91) established Tangerine Road from First Avenue (in Oro Valley) to US 89 (now SR 77) as a state highway.

9. Does this route meet criteria for “other major facilities” (per Route Transfer and Level of Development Study) which includes:
   - 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, Tangerine Road meets the fourth (bullet) criteria because it is an urban connecting route (it is classified as an urban principal arterial, according to federal functional classification) which forms a connection at both ends to a state highway, because it connects to Interstate 10 and SR-77. It does not connect to any rural National Highway System routes. While the route will serve freight traffic coming into/from the Catalina/Oro Valley area from the I-10, the specific volume of freight traffic is unknown.
10. Does this route meet criteria for “other statewide routes” (per Route Transfer and Level of Development Study), which includes:

- 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

Yes. Tangerine Road could carry between 44,300 vpd and 71,700 vpd if improved to an access-controlled facility. It will form a network connecting I-10 and SR 77 which would not be parallel to another state highway route.

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest (per Route Transfer and Level of Development Study).

Yes, Tangerine Road serves a number of points of state and national interest, including Catalina State Park and the Coronado National Forest.

**Conclusions**

Tangerine Road meets all the criteria for a state highway, with the exception of Criteria 5 (Interconnection with Routes of Other States). It meets the main criteria for designation as state highway because it would form the only continuous east-west access-controlled connection between I-10 and SR 77.

**3.1.2 Tangerine Corridor with Connection to I-10 Via Camino De Manana**

In this alternative, Tangerine Road is connected to I-10 via an access controlled connection on Camino de Manana (using a Tortolita Road alignment) which leads to the planned I-10 / Twin Peaks Road interchange.

A comparison of 2030 forecast traffic volumes between the base RTP network and the access controlled configuration can be summarized as follows:

<table>
<thead>
<tr>
<th>Road segment</th>
<th>PAG 2030 RTP Volumes (vehicles per day)</th>
<th>Special Loop 2030 Model (vehicles per day)</th>
<th>Change in traffic volume (vehicles per day) (Rounded to the nearest 100 vpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangerine Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 77 to Rancho Vistoso Blvd/First Avenue</td>
<td>20,000</td>
<td>44,700</td>
<td>+24,700</td>
</tr>
<tr>
<td>Rancho Vistoso Blvd/First Avenue to La Cholla Blvd.</td>
<td>28,000</td>
<td>71,000</td>
<td>+43,000</td>
</tr>
<tr>
<td>La Cholla Blvd. to Thornydale Road</td>
<td>42,000</td>
<td>58,996</td>
<td>+17,000</td>
</tr>
<tr>
<td>Thornydale Blvd to Tortolita Road</td>
<td>25,200</td>
<td>43,300</td>
<td>+18,100</td>
</tr>
<tr>
<td>Tortolita Road to I-10</td>
<td>30,400</td>
<td>26,017</td>
<td>-4,400</td>
</tr>
<tr>
<td>Road segment</td>
<td>PAG 2030 RTP Volumes (vehicles per day)</td>
<td>Special Loop 2030 Model (vehicles per day)</td>
<td>Change in traffic volume (vehicles per day) (Rounded to the nearest 100 vpd)</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>----------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Tortolita Road, Tangerine to Camino De Manana</td>
<td>9,600</td>
<td>31,600</td>
<td>+22,000</td>
</tr>
<tr>
<td>Camino de Manana, Tortolita Road to I-10</td>
<td>17,100</td>
<td>32,643</td>
<td>+15,500</td>
</tr>
</tbody>
</table>

The model results from the Special Loop 2030 Model indicate that Tangerine Road traffic grew by 40% to 124%, as an access controlled facility, with the exception of the segment between Tortolita Road and I-10. Camino de Manana traffic grew by 90% to 229% as an access controlled facility.

Analysis indicates that approximately 3,700 vehicles per day would be through trips between I-10 and Oracle Road (SR 77), using Camino de Manana. This indicates that the corridor will carry approximately 10% through trips as a six-lane access controlled facility in 2030.

A brief evaluation of the state highway criteria for Tangerine Road via Camino de Manana as an access controlled facility is provided as follows:

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)
   Yes and no. As discussed in Section 3.1.1, Tangerine Road has been designated as a state route from I-10 to SR-77 and the segment from SR 77 to First Avenue has been designated as a state highway, but Camino de Manana and Tortolita Road have not been designated as state routes.

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, Tangerine Road connects I-10 (a state highway) and SR 77 (a state highway) through the Towns of Marana and Oro Valley. In this alternative it will connect to I-10, via Camino De Manana (which leads to a planned I-10/Twin Peaks Road interchange).

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5)
   Yes, in its future design configuration, Tangerine Road and Camino de Manana will be access controlled facilities. There are estimated be approximately 3,700 through trips between I-10 and SR 77 using Camino de Manana and Tangerine Road.

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)
   Yes, Tangerine Road connects the Town of Marana and Oro Valley. It also provides access to the population centers of Saddlebrooke and the Town of Catalina.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
   No, Tangerine Road and Camino de Manana 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, as an access-controlled roadway, this is a high-capacity facility.

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 I-10 to SR 77 and SR 79.

8. Is this route designated as an Interstate Highway or Urban freeway (per Route Transfer and Level of Development Study)
Yes and no. As mentioned in Criteria 1, Resolution 86-01-A-10 (1/20/86) which designated Tangerine Road from I-10 to US 89 (now SR 77) as a state route noted that PAG adopted and approved the expansion of the PAG Regional Freeway/Expressway Plan to include this route, indicating that Tangerine Road is part of the PAG urban freeway system. However, Camino de Manana is not designated as an interstate highway or urban freeway.

9. Does this route meet criteria for “other major facilities” (per Route Transfer and Level of Development Study) which includes:
- 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, Tangerine Road meets the fourth (bullet) criteria because it is an urban connecting route which forms a connection at both ends to a state highway, because it connects to Interstate 10 and SR 77.

10. Does this route meet criteria for “other statewide routes” (per Route Transfer and Level of Development Study), which includes:
- 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

Yes, when widened Tangerine Road (an urban principal arterial) will carry between 44,300 vehicles per day, at the east end of the corridor, and an estimated 71,000 vpd between La Canada Drive and First Avenue. Camino de Manana is federally functionally classified as an urban collector route. At the west end of the corridor the Camino de Manana connection will carry an estimated 31,555 vpd to 33,450 vpd. Tangerine Road, between Camino de Manana and I-10, will carry an estimated 25,400 vpd to 26,400 vpd. It will form a network connecting I-10 and SR 77. It is not parallel to another state route.

11. Does this route meet criteria for “Non-statewide routes” serving points of state and national interest (per Route Transfer and Level of Development Study).
Yes, Tangerine Road serves a number of points of state and national interest, including Catalina State Park and the Coronado National Forest.
Conclusions
The Tangerine Road corridor option of an access-controlled connection to Camino de Manana/Tortolita Road does not meet all the criteria for a state highway designation, primarily because of the status of Camino de Manana and Tortolita Road. Camino de Manana and Tortolita Road do not meet Criteria 1 (Designation as State Route) because they are not designated as state routes, which must be done prior to designation as a state highway. Camino de Manana and Tortolita Road do not meet Criteria 8 (Designation as an interstate highway or urban freeway). The entire corridor does not meet Criteria 5 (Interconnection with Routes of Other States). The provision of a Camino de Manana connection diverts approximately 23,000 vehicles per day from Tangerine Road at the west end of the corridor. These trips are more likely to be drivers seeking to travel into/from Tucson, or I-19 south, whereas those trips which remain on Tangerine Road are more likely to be traveling west on I-10.

3.2 Sahuarita Corridor, I-19 to I-10

As documented in the draft report for the PAG Southeast Area Arterial Study, a revised Sahuarita Corridor alignment was recommended as a new six-lane access controlled facility which connects with Interstate 19 (I-19) via a system interchange in the vicinity of El Toro Road (south of Sahuarita Road). The recommended facility extends east along the El Toro Road alignment and then turns north along the Wilmot Road alignment minimizing impacts to sensitive cultural areas as well as avoiding the Sahuarita Bombing Range. North of protected cultural resource areas, the freeway shifts to the Kolb Road alignment to provide continuity to areas north of I-10, and connects to the I-10/Kolb Road interchange. This corridor includes an east-west extension along the Andrada Road alignment from Wilmot Road to I-10 in the vicinity of SR-83 to provide future opportunities for a fully access controlled roadway connecting with I-10 to the east.

The 2030 Regional Transportation Plan includes the construction of a new limited access roadway on the eventual Sahuarita Corridor alignment, from I-19 to Wilmot Road. This specific corridor alignment was not modeled in the 2030 base RTP network at the time of this report.

A Special Loop Model run was conducted to determine traffic projections for the access controlled six-lane facility and the traffic forecasts are summarized below:

East-West Segments (El Toro Road/Andrada Road alignment)
- El Toro Road alignment (I-19 to Wilmot Road): 28,600 to 43,400 vpd
- Andrada Road, Kolb/Wilmot intersection to Houghton Road: 53,300 vpd
- Andrada Road, Houghton Road to I-10/SR 83 interchange: 17,800 vpd

North-South Segment (Wilmot Road/Kolb Road alignment)
- Wilmot Road alignment (El Toro Road to Andrada Road): 40,800 to 95,150 vpd
- Kolb Road alignment (Andrada Road to I-10): 93,000 to 106,260 vpd

These results indicate that the Sahuarita Corridor will carry significant traffic volumes through the corridor, particularly the north-south segment of the corridor. A brief evaluation of the state highway criteria for the Sahuarita corridor is summarized as follows:
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 Sahuarita Corridor was designated as the Sahuarita Road Highway, SR 982 from I-19 east to I-10 under Resolution 86-01-A-08 (1/20/86). The resolution states that the State Route Plan is to be established, adopted, and approved as shown in Appendix A of the resolution, which shows the state route located on the Sahuarita Road alignment, and veering northeast to connect to the I-10/SR 83 interchange (Mountain View interchange). Kolb Road and Wilmot Road south of I-10 are not designated as state routes. Although the specific corridor is not designated as a state route, the idea of a Sahuarita corridor as a state route is embodied in Resolution 86-01-A-08.

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 Sahuarita Corridor will connect I-19 (an interstate facility), I-10 (an interstate facility), and State Route 83 (a state highway), and provides access through the Town of Sahuarita.

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5).

Yes. In 2030 the east-west alignment is anticipated to carry approximately 10,000 through trips per day between I-19 and the Houghton Road/I-10 area, representing 17% to 50% through trips. The north-south segment of the corridor, via Wilmot Road/Kolb Road is anticipated to carry 30,000 through trips per day from the Sahuarita area to I-10 and areas north of I-10, representing 27% to 60% through trips. It will provide a through route for freight movement to and from Mexican Ports of Entry.

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)

Yes, the Sahuarita Corridor will connect the Town of Sahuarita with Davis-Monthan Air Force Base and the Tucson metropolitan area north of I-10. It also connects growth areas on Tucson’s southeast area, including the Southlands area, and the University of Arizona Technology Park, located north of I-10 between Kolb Road and Rita Road. This corridor also provides better access to the Tohono O’odham Nation, San Xavier District, located west of I-19. It provides connections to new growth areas east of Tucson, such as the Benson area.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)

No, the Sahuarita 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 2030 projected traffic volumes range from 18,000 to 43,000 vehicles per day on the east-west corridor roadways and from 41,000 and 106,000 vehicles per day on the north/south corridor segment. It is needed to form provide a network connection in the rapidly growing Sahuarita area and Southlands area. The corridor will provide east-west and north/south connectivity in the future southern Tucson metropolitan area, forming a link between I-19 and I-10.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)

Yes, this corridor will facilitate regional movement because it will connect I-19, I-10 and SR 83, and it will serve the growing area of Sahuarita and the Southlands growth areas, as well as growth in Santa Cruz County. It will serve statewide travel because it will provide a better transportation system to serve the Puerto Nuevo area and the Tucson International Airport area. It will also serve as a freight route,
reducing truck traffic on SR 83 and through central Tucson. This route provides an interstate travel benefit, by serving as a southwest passage for trucks traveling from Nogales and east to I-10.

8. Is this route designated as an Interstate Highway or Urban freeway (per Route Transfer and Level of Development Study)
No, this facility is not designated as an interstate highway or urban freeway.

9. Does this route meet criteria for “other major facilities” (per Route Transfer and Level of Development Study) which includes:
- 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 Sahuarita Corridor meets the fourth (bullet) criteria because it is an urban connecting route which forms a connection at both ends to a state highway, because it connects to Interstate 10 (at Kolb Road and at the Mountain View interchange), SR 83 and Interstate 19 (part of the Canamex Corridor). Although truck data is not available, it would provide a route for trucks traveling to/from Mexico and areas east of Tucson. Additionally, Kolb Road is a National Highway System Route (NHS) between I-10 and Sunrise Drive, so the north/south connection of this corridor links to a NHS route.

10. Does this route meet criteria for “other statewide routes” (per Route Transfer and Level of Development Study), which includes:
- 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

Yes, when constructed, the Sahuarita Corridor will consist of urban arterial routes with more than 5,000 vehicles per day, and it will be a connecting route which will form a network linking I-10, I-19, and SR 83.

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest (per Route Transfer and Level of Development Study).
Yes, the Sahuarita Corridor will serve the following points of state or national interest:
- The Tucson International Airport (TIA) is the only commercial service airport in Pima County and has about 69 flights depart from TIA on a typical day.
- There are currently three prisons within the Southeast Area: the Arizona State Correctional Facility, the Federal Medium Security Prison, and the US Penitentiary. All three are located along Wilmot Road south of I-10.
The Pima County Southeast Regional Park, which is managed by Pima County Parks and Recreation Department, includes the Pima County Fair Grounds, the Southwestern International Raceway, the Tucson Raceway Park, and is planned to include a dirt track, a shooting range, and sports fields.

Puerto Nuevo is planned to be a multidimensional inland port with facilities in the Southeast Area that will serve local, regional, and international trade. The Tucson-Mexico Trade Office, an organization under the City of Tucson, is the lead on Puerto Nuevo.

University of Arizona Science and Technology Park and Davis Monthan Air Force Base are both major employers in the vicinity of the corridor.

Conclusions
The Sahuarita Corridor (although not the specific alignment under consideration) meets many of the criteria for a state highway, with the exception of Criteria 1 (*Designation as a State Route*), Criteria 5 (*Interconnection Route with Those of Other States*) and Criteria 8 (*Designation as an interstate highway or urban freeway*). The corridor does not meet Criteria 1 because the east-west segment of the corridor was designated as a state route on the Sahuarita Road alignment and the Kolb Road/Wilmot Road connection to the north is not designated as a state route. The Sahuarita Corridor forms a system which links I-10 (at the Kolb Road interchange and Mountain View interchange), I-19, and SR 83 through the Town of Sahuarita.

The final preferred alignment for the Sahuarita Corridor needs to be specifically designated as a state route to meet the basic criteria for a state highway.

3.3 Loop Corridor (Houghton Road, Golf Links Road, Alvernon Way, and Swan Road)

This Loop Corridor consists of Houghton Road, Golf Links Road, Alvernon Way and Swan Road. (The Sahuarita Corridor “closes” this loop on the south). Each roadway segment comprising the Loop Corridor was analyzed to determine if it met the criteria for a state highway designation.

3.3.1 Houghton Road, Golf Links Road to Andrada Road

Houghton Road is currently a two-lane facility, which carries approximately 19,200 vehicles per day (vpd) between Golf Links Road and Escalante Road and 4,200 vpd south of I-10 (2002 counts). In the 2030 Regional Transportation Plan (RTP), Houghton Road improvements include widening between Sahuarita Road and Old Vail Road (two-lanes to four-lanes), widening between Old Vail Road and Old Spanish Trail (two-lanes to six lanes) and widening from Old Spanish Trail and Snyder Road (from two-lanes to four lanes). Future (2030) RTP traffic volume projections on Houghton Road including these improvements are:

- **Houghton Road**
  - Golf Links Road to Valencia Road: 80,200 vpd
  - Valencia Road to I-10: 64,600 vpd
  - I-10 to Pima Mine Road: 50,700 vpd
As part of the special focus Loop Corridor, Houghton Road was modeled as an access controlled facility between Golf Links Road and Andrada Road. A comparison of traffic volume projections between the base RTP network and the access controlled configuration that was modeled in the Special Loop 2030 Model are:

<table>
<thead>
<tr>
<th>Road segment</th>
<th>PAG 2030 RTP Volumes (vehicles per day)</th>
<th>Special Loop 2030 Model (vehicles per day)</th>
<th>Change in traffic volume (vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Houghton Road</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Golf Links Road to Valencia Road</td>
<td>80,200</td>
<td>135,200</td>
<td>+55,000</td>
</tr>
<tr>
<td>Valencia Road to I-10</td>
<td>64,600</td>
<td>140,100</td>
<td>+75,500</td>
</tr>
<tr>
<td>I-10 to Andrada Road</td>
<td>50,700</td>
<td>83,300</td>
<td>+32,600</td>
</tr>
</tbody>
</table>

These traffic volume projections indicate that Houghton Road traffic will increase by 64% to 116% as an access controlled facility.

An analysis of through trips indicated that the access controlled Houghton Road alignment will carry approximately 5,000 through vehicle trips per day from I-19 to I-10 and north, 15,000 through vehicle trips per day between Sahuarita and I-10 north, and 25,000 through vehicle trips per day from Golf Links Road and points north to I-10 and points south of I-10.

A brief evaluation of the state highway criteria for Houghton Road as an access-controlled facility is summarized as follows:

1. Has this route been designated as a State Route? If yes, what are the specifics of the route designation (per ARS 28-101, 28-7041)?
   Yes, Houghton Road, from Sahuarita Road to Golf Links Road, was designated as State Route 983, per Resolution Number 86-01-A-08 on January 20, 1986.

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, Houghton Road will form a convenient and necessary north-south link between the City of Tucson and the Town of Sahuarita, Corona de Tucson, and the growing southeast area. Houghton Road will intersect with the Sahuarita Corridor (a state route), I-10 (a state highway), Valencia Road (a state route), Golf Links Road (a state route) and further north, Grant Road (a state route).

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5)
   Yes, as part of the Loop Corridor, Houghton Road would be an access-controlled facility. Future (2030) traffic volume projections indicate that Houghton Road will carry approximately 5,000 through vehicle trips per day between I-19 and I-10 and areas north, 15,000 through vehicle trips per day between the Town of Sahuarita and I-10 and areas north, and 25,000 through vehicle trips per day between Golf Links Road (and areas north) and I-10 (and areas south of I-10).
4. Does this route connects population centers (Per State Transportation Board Policy No. 5)
Yes. Houghton Road connects the City of Tucson and the Town of Sahuarita, Corona de Tucson and the southeast area. Improving Houghton Road in the future will enhance this connection and will connect the Houghton Road growth areas and the Southlands growth area.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
No, Houghton Road does not connect with state highways or routes 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.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No.16)
Yes, Houghton Road provides regional movement of people and goods by providing a north/south route between the City of Tucson and growing areas south of I-10. It provides statewide traffic movement via linkages with Interstate 10. The Houghton Road connection to the Sahuarita Corridor also provides a link to Interstate 19.

8. Is this route designated as an Interstate Highway or Urban freeway (per Route Transfer and Level of Development Study)
Yes, as mentioned in Criteria 1, Resolution 86-01-A-07 (1/20/86) which designated Houghton Road from Golf Links Road to Sahuarita Road as a state route noted that PAG adopted and approved the expansion of the PAG Regional Freeway/Expressway Plan to include this route, indicating it is part of the PAG urban freeway system.

9. Does this route meet criteria for “other major facilities” (per Route Transfer and Level of Development Study) which includes:
- 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, when reconstructed, this route will function as an urban arterial, and future truck traffic on this route is unknown. Currently, between Golf Links Road and Andrade Road, Houghton Road has a mix of both rural and urban functional classifications. It does not connect at either ends to Freeways or other major facilities (state highways), however, it connects to state routes at both ends (Golf Links Road and Sahuarita Road). It should be noted that Houghton Road itself, between I-10 and Golf Links Road, is a designated National Highway system route (the segment between I-10 and Old Vail Road is a rural NHS route), and it connects to another designated National Highway System route, Golf Links Road.

10. Does this route meet criteria for “other statewide routes” (per Route Transfer and Level of Development Study) which includes:
- 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

Yes, this is an urban arterial route which is projected to carry up to 140,000 vehicles per day. It is not parallel with any state highways of higher classification. The high projected volumes on this link demonstrate that it is a necessary linkage connecting I-10 and other state routes, including the Sahuarita Corridor, Golf Links Road, and Valencia Road.

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest (per Route Transfer and Level of Development Study).

Yes, Houghton Road serves a number of points of state and national interest. It connects Interstate 10 to the Coronado National Forest on both the north and south ends of the roadway. It serves the Pima County Fairgrounds, provides a connection to the Davis Monthan Air Force Base, via Irvington Road and Golf Links Road, and provides access to the Mount Lemmon / Summerhaven area from the south.

Conclusions
Houghton Road meets all the criteria for a state highway, with the exception of Criteria 5 (Interconnection Route with Those of Other States). As part of this special focus Loop Corridor, Houghton Road would qualify as a state highway, because it is a projected high volume route serving as an important linkage between I-10, and the Sahuarita Corridor (if designated as a state highway), and the Southlands growth area.

3.3.2 Golf Links Road, Aviation Parkway to Houghton Road

Golf Links Road is currently a six-lane divided arterial roadway between Alvernon Way and Harrison Road and a four-lane divided facility between Harrison Road and Houghton Road. The federal functional classification of Golf Links Road between Alvernon and Kolb Road is an Urban Other Freeway. The federal functional classification of Golf Links Road between Kolb Road and Houghton Road is an Urban Principal Arterial. Current (2003) average daily traffic volumes on Golf Links Road are between 48,000 and 58,000 vehicles per day (vpd) from Alvernon Way to Wilmot Road and between 27,600 and 44,900 vpd from Wilmot Road to Harrison Road. Existing traffic volumes along Golf Links Road between Harrison Road and Houghton Road were 11,500 vpd in 2003.

According to the 2030 Regional Transportation Plan, intersection improvements are planned at the intersections of Golf Links Road/Swan Road, and Golf Links Road/Wilmot Road and Golf Links Road/Kolb Road. These intersection improvements involve the addition of turn lanes at all three intersections, and traffic signal improvement at Golf Links/ Kolb Road. Another planned project is a traffic interchange improvement at the Golf Links Road / Barraza Aviation Parkway / Alvernon traffic interchange. Traffic projections from the 2030 network based on these improvements indicate that Golf Links Road will carry 51,900 vehicles per day between the Barraza-Aviation Parkway and Kolb Road, and approximately 33,200 vpd between Harrison Road and Houghton Road.
Future (2030) RTP model projected two-way traffic volumes are:

**Golf Links Road**
- Barraza-Aviation Parkway to Swan Road: 52,000 vpd
- Swan Road to Craycroft Road: 53,500 vpd
- Craycroft Road to Wilmot Road: 51,900 vpd
- Wilmot Road to Kolb Road: 43,500 vpd
- Kolb Road to Houghton Road: 46,000 vpd

A comparison of the base RTP and the special loop 2030 model are summarized as follows:

<table>
<thead>
<tr>
<th>Road segment</th>
<th>PAG 2030 RTP Volumes (vehicles per day)</th>
<th>Special Loop 2030 Model (vehicles per day)</th>
<th>Change in traffic volume (vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Golf Links Road</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barraza-Aviation Parkway to Swan Road</td>
<td>52,000</td>
<td>50,600</td>
<td>-1,400</td>
</tr>
<tr>
<td>Swan Road to Craycroft Road</td>
<td>53,500</td>
<td>121,000</td>
<td>+67,500</td>
</tr>
<tr>
<td>Craycroft Road to Wilmot Road</td>
<td>51,900</td>
<td>127,500</td>
<td>+75,600</td>
</tr>
<tr>
<td>Wilmot Road to Kolb Road</td>
<td>43,500</td>
<td>126,500</td>
<td>+83,000</td>
</tr>
<tr>
<td>Kolb Road to Houghton Road</td>
<td>46,000</td>
<td>110,700</td>
<td>+64,700</td>
</tr>
</tbody>
</table>

These traffic projections indicate that east of Swan Road; Golf Links Road traffic will increase by 126% to 191% as an access controlled facility.

An analysis of through trips indicated that approximately 35,000 vehicle trips per day are estimated to be through trips between Houghton Road and the connection to the Barraza-Aviation Parkway and Alvernon Way. This represents approximately 27% to 35% through trips.

A brief evaluation of the state highway criteria for Golf Links Road is provided as follows:

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)

   Yes, Golf Links Road has been designated as a state route, SR 810. This designation was made under two separate resolutions. Resolution number 82-03-A-17 (4/16/82) was a resolution of clarification and reaffirmation that the corridor portion of the Butterfield Parkway (State Route 810, originally designated by Highway Commission Resolution 71-21) between Alvernon Way and Pantano Parkway be renamed as the Golf Links Corridor Route (Alvernon Way to Camino Seco). Resolution 86-01-A-11 (1/20/86) designated SR 810 as the Golf Links Extension Highway, from Camino Seco east to Houghton Road. Golf Links Road, between Alvernon Way and Houghton Road is also part of the National Highway System, and it is a part of the Major Strategic Corridor Network (STRAHNET).
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, Golf Links Road provides a necessary link between the Barraza Aviation Parkway (SR 210) and Houghton Road (SR 983). This is demonstrated by the large forecast 2030 traffic volumes, particularly between Swan Road and Kolb Road, which are in excess of 120,000 vpd. It will effectively extend the Barraza-Aviation corridor east to Houghton Road and south to the Sahuarita Corridor, and will increase the effectiveness of the Barraza-Aviation Parkway as a route to the Tucson Central Business District.

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5)
Yes, this facility would be designed as an access controlled facility. As mentioned above, 2030 through trips are estimated to be approximately 35,000 vehicle trips per day between Houghton Road and the connection to the Barraza-Aviation Parkway and Alvernon Way, representing 27% to 35% through trips.

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)
Yes, it would connect the Houghton Road growth area with central Tucson and the downtown businesses.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
No, Golf Links Road does not interconnect with routes in other states.

6. Is this route a high capacity connecting route needed to form an efficient network? (State Transportation Board Policy No. 5)
Yes, as an access controlled facility, future (2030) traffic forecasts indicate it will carry between 50,600 and 127,500 vehicles per day.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)?
Yes, this route provides regional movement of people and goods via connections to the Barraza-Aviation Parkway (SR 210) and Houghton Road (SR 983).

8. Designated as Interstate Highway or Urban freeway? (Per Route Transfer and Level of Development Study).
Yes, Golf Links Road is designated as an urban other freeway, between Alvernon Way and Kolb Road. Between Kolb Road to Houghton Road, it is designated as an urban principal arterial. Resolution 86-01-A-11 (1/20/86) which designated the Golf Links Extension Highway from Camino Seco to Houghton Road as a state route noted that PAG adopted and approved the expansion of the PAG Regional Freeway/Expressway Plan to include this route, indicating it is part of the PAG urban freeway system. So the majority of the route is classified as an urban freeway.

9. Does this route meet criteria for “Other Major facilities” (Per Route Transfer and Level of Development Study)?
- 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 (state highways).

No, Golf Links Road, an urban route, connects only at one end to a state highway (Barraza-Aviation Parkway) and connects at the east end to Houghton Road (SR 983), a state route (but not a state highway).

10. Does this route meet criteria for “other statewide routes” (Per Route Transfer and Level of Development Study).

- 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

Yes, Golf Links Road is an urban arterial route which will provide a connecting route between the Barraza-Aviation Parkway (SR 210) and Houghton Road (SR 983).

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest. (Per Route Transfer and Level of Development Study).

Yes, Golf Links Road directly serves Davis Monthan Air Force Base, which is a military facility of state and national interest. Between Alvernon Way and Houghton Road, it is a part of the Major Strategic Corridor Network (STRAHNET), which is identified by the Department of Defense in cooperation with USDOT. These routes are designed to mobilize resources for national defense. It is also a National Highway System route.

Conclusions
Golf Links Road meets all the criteria for a state highway, with the exception of Criteria 5 (Interconnection Route with Those of Other States), and Criteria 9 (Criteria for “Other Major Facilities”).

3.3.3. Alvernon Way, Barraza Aviation Parkway to El Toro Road (Via Swan Road)

As part of the special focus Loop Corridor, Alvernon Way and Swan Road form a north /south access controlled facility between the Barraza-Aviation Parkway and the El Toro Road alignment of the Sahuarita corridor. Alvernon Way transitions to a Swan Road alignment at approximately Los Reales Road.

Alvernon Way between Golf Links Road and Drexel Road is currently a four-lane divided roadway carrying approximately 23,000 to 54,500 vehicles per day, based on 2003 counts. Between Drexel Road and Valencia Road, Alvernon Way is a four lane roadway with a center left turn lane. Existing (2004) traffic volumes on this segment range from 17,000 to 23,000 vehicles per day. South of Valencia Road,
Alvernon Way is a two-lane, undivided facility. No current traffic counts were available for this segment.

Swan Road is a two-lane undivided roadway between Los Reales Road and Old Vail Road. No traffic counts were available for this road segment.

The 2030 Regional Transportation Plan includes construction of a new four-lane roadway on the Swan Road alignment from Old Vail Road to the Alvernon/Valencia intersection, for a length of 4.61 miles. There are no improvements planned on Alvernon Way, within the study area. The future (2030) RTP traffic volumes are summarized as follows:

### Alvernon Way
- Aviation Parkway to Ajo Way: 34,100 vpd
- Ajo Way to I-10: 10,100 vpd
- I-10 to Benson Highway: 10,100 vpd
- Benson Highway to Valencia Road: 38,000

### Swan Road
- Valencia Road to Old Vail Road: 49,300 vpd
- Old Vail Road to Pima Mine Road: Not included
- Pima Mine Road to El Toro Road: Not included

As part of the special focus Loop Corridor assessment, this facility was modeled as an access controlled facility, between the Barraza- Aviation Parkway and El Toro Road. A comparison of the base 2030 RTP volumes and 2030 traffic volumes under the future access controlled configuration are summarized as follows:

<table>
<thead>
<tr>
<th>Road segment</th>
<th>PAG 2030 RTP Volumes (vehicles per day)</th>
<th>Special Loop 2030 Model (vehicles per day)</th>
<th>Change in traffic volume (vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alvernon Way</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aviation Parkway to Ajo Way</td>
<td>34,100</td>
<td>40,100</td>
<td>+6,000</td>
</tr>
<tr>
<td>Ajo Way to I-10</td>
<td>10,100</td>
<td>114,200</td>
<td>+104,100</td>
</tr>
<tr>
<td>I-10 to Benson Highway</td>
<td>10,100</td>
<td>113,700</td>
<td>+103,600</td>
</tr>
<tr>
<td>Benson Highway to Valencia Road</td>
<td>38,000</td>
<td>110,740</td>
<td>+72,740</td>
</tr>
<tr>
<td><strong>Swan Road</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valencia Road to Old Vail Road</td>
<td>49,300</td>
<td>129,900</td>
<td>+80,300</td>
</tr>
<tr>
<td>Old Vail Road to Pima Mine Road:</td>
<td>Not included</td>
<td>87,900</td>
<td>+87,900</td>
</tr>
<tr>
<td>Pima Mine Road to El Toro Road:</td>
<td>Not included</td>
<td>28,200</td>
<td>+28,200</td>
</tr>
</tbody>
</table>

This comparison clearly shows that constructing and widening the corridor to an access controlled facility will result in traffic volume increases of 17% to over 1000% in some segments of Alvernon Way.
An analysis of through trips indicated that in 2030 the route will attract approximately 10,000 through trips between I-19 and I-10 and areas north (this represents 8% to 14% through trips), and approximately 20,000 through trips per day between Sahuarita and I-10 and areas north (this represents 17% to 29% through trips).

A brief evaluation of the state highway criteria for these segments of Alvernon Way and Swan Road are:

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)
   Yes and No. Alvernon Way is designated as a state route (State Route 489) between Valencia Road and Grant Road, per Resolution Number 86-01-A-05, dated 1/20/86. Swan Road is not 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, this north/south route connects the Barraza-Aviation highway (SR 210) to the Sahuarita Corridor, with a connection to I-10.

3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5).
   Yes, as an access controlled facility, it is primarily designed to carry through traffic. As mentioned previously, the 2030 traffic forecasts indicate that the corridor will serve approximately 10,000 through trips between I-19 and I-10 and areas north (this represents 8% to 14% through trips), and approximately 20,000 through trips per day between the Town of Sahuarita and I-10 and areas north of I-10 (this represents 17% to 29% through trips).

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)
   Yes, this route connects Tucson, Sahuarita, and the Southlands growth area.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
   No, Swan Road does not connect to routes 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, this route will attract significant forecast traffic volumes, up to 129,900 vehicles per day.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)
   Yes, this route provides regional movement of people and goods by facilitating travel from the central area of Tucson to the southern area of Tucson, and to the Town of Sahuarita. It provides access to I-10 and the Barraza-Aviation Parkway from the airport area and from the Sahuarita area, as evidenced by the high projected traffic volumes on this route.

8. Designated as Interstate Highway or Urban freeway? (Per Route Transfer and Level of Development Study).
   Yes and No. Swan Road is not designated as an Interstate Highway or urban freeway, however, Resolution 86-01-A-05 (1/20/86) which designated the Alvernon Way Highway from Grant Road to Valencia Road as a state route noted that PAG adopted and approved the expansion of the PAG.
Regional Freeway/ Expressway Plan to include this route, indicating it is part of the PAG urban freeway system. So part of this route is classified as an urban freeway.

9. Does this route meet criteria for “other major facilities” includes (Per Route Transfer and Level of Development Study).
   - 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 (e.g. state highways)

No, the Alvernon / Swan Road alignment is an urban connecting route which does not connect two state highways. It connects one state highway, the Barraza-Aviation Parkway (SR 210) and the Sahuarita Corridor (SR 982), a state route on the Sahuarita corridor alignment. Anticipated freight traffic on this route is unknown.

10. Does this route meet criteria for “other statewide routes” includes (Per Route Transfer and Level of Development Study).
    - 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

Yes, this route is an urban arterial route that carries between 28,000 to 129,900 vpd. This route forms a network that connect the Barraza-Aviation Parkway to the Sahuarita Corridor.

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest. (Per Route Transfer and Level of Development Study).

Yes, this route will provide a connection to the Tucson International Airport. It also provides access to Davis-Monthan Air Force Base from the rapidly growing Southlands area.

Conclusions
Alvernon Way/Swan Road meets all the criteria for a state highway, with the exception of Criteria 5 (Interconnection Route with those of other states) and Criteria 9 (Criteria for “Other Major Facilities”). Criteria 1 (Designation of a State Route) is partially met (Alvernon Way has been designated as a state route, Swan Road has not been designated) and Criteria 8 (Designation as an interstate highway or urban freeway is partially met.)
3.4 Barraza - Aviation Corridor Extension, Golf Links Road to I-10

The Barraza-Aviation Parkway is currently a State Highway (SR 210) between Broadway Boulevard to Alvernon /Golf Links Road. The Barraza-Aviation Parkway is a 6-lane divided roadway between Broadway Boulevard and 22nd Street, which carries between 23,700 vehicles per day and 28,800 vehicles per day. The eastern half of the Barraza-Aviation Parkway, between 22nd Street and Golf Links Road, is a four-lane facility which carries traffic volumes of 27,800 to 30,300 vehicles per day. The federal functional classification of the Barraza-Aviation Parkway is an urban other freeway. Currently the Barraza-Aviation Parkway terminates at Golf Links Road.

The Draft 2030 Regional Transportation Plan lists a four-phase project for the Barraza-Aviation Parkway:

- Phase 1 – Broadway to Church - extend parkway
- Phase 2 – 6th Avenue Underpass - construct grade separation
- Phase 3 – I-10 to Church via St. Mary’s - design and construct new roadway
- Phase 4 – Stone Avenue Underpass - design and construct new underpass

The special focus corridor concept for this facility is to extend the Barraza-Aviation Parkway south from Golf Links Road to an interchange connection with I-10 and Valencia Road. This connection is part of the base RTP 2030 network, and is projected to carry the following two-way daily traffic volumes:

- Barraza-Aviation Parkway
  - Broadway to 22nd Street: 67,600 vpd
  - 22nd Street to Golf Links Road: 56,000 vpd
  - Golf Links Road to Ajo Way: 50,400 vpd
  - Ajo Way to Valencia Road: 51,100 vpd

This extension is estimated to attract approximately 3,000 through trips per day between I-10 (near downtown) and I-10 (near the Valencia Road area). This represents between 4 % and 20% of the trips on the corridor.

A brief analysis of the state highway criteria for the extension of this corridor is summarized as follows:

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 extension of Barraza-Aviation from Golf Links Road to Valencia Road has not been designated as a state route. Resolution 82-03-A-17, dated 4/16/82, designates Aviation Corridor as State Route 210 from I-10 at St. Mary’s Road east to Alvernon Way. Resolution 83-03-A-09 designates SR 810 as Aviation Corridor/Golf Links Road, described as comprising Golf Links Road (Alvernon Way to Camino Seco).

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, this extension would connect I-10 at two points: Valencia Road and via St. Mary’s Road.
4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Based on the assessment of the special focus corridors with respect to meeting state highway criteria the following conclusions can be made:

Tangerine Road, I-10 to SR 77

Tangerine Road meets all the criteria for a state highway, with the exception of Criteria 5 (Interconnection Route with Those of Other States). It meets the main criteria for designation as state highway because it will form the only continuous access-controlled high capacity connection between I-10 and SR 77.

The Tangerine Road corridor option of an access-controlled connection to Camino de Manana/Tortolita Road does not meet all the criteria for a state highway designation, primarily because of the status of Camino de Manana and Tortolita Road. Camino de Manana and Tortolita Road do not meet Criteria 1 (Designation as State Route) because they are not designated as state routes, which must be done prior to designation as a state highway. Camino de Manana and Tortolita Road do not meet Criteria 8 (Designation as an interstate highway or urban freeway). The entire corridor does not meet Criteria 5 (Interconnection with Routes of Other States). The provision of a Camino de Manana connection diverts approximately 23,000 vehicles per day from Tangerine Road at the west end of the corridor. These trips are more likely to be drivers seeking to travel into/from Tucson, or I-19 south, whereas those trips which remain on Tangerine Road are more likely to be traveling west on I-10.

In summary, Tangerine Road, between I-10 and SR 77 meets ten of the eleven criteria for a state highway, and Tangerine Road, I-10 to SR 77, with a direct connection to Camino de Manana, meets eight of the eleven criteria for a state highway, as summarized in Exhibit 6.

Sahuarita Corridor, I-19 to I-10

The Sahuarita Corridor (although not the specific alignment under consideration) meets many of the criteria for a state highway, with the exception of Criteria 1 (Designation as a State Route), Criteria 5 (Interconnection Route with Those of Other States) and Criteria 8 (Designation as an interstate highway or urban freeway). The corridor does not meet Criteria 1 because the east-west segment of the corridor was designated as a state route on the Sahuarita Road alignment and the Kolb Road/Wilmot Road connection to the north is not designated as a state route. The Sahuarita Corridor forms a system which links I-10 (at the Kolb Road interchange and Mountain View interchange), I-19, and SR 83 through the Town of Sahuarita. The final preferred alignment for the Sahuarita Corridor needs to be specifically designated as a state route to meet the basic criteria for a state highway. This corridor meets eight of the eleven criteria for a state highway, as summarized in Exhibit 6.

Loop Corridor (Houghton Road, Golf Links Road, Alvernon Way, and Swan Road)

This Loop Corridor consists of Houghton Road, Golf Links Road, Alvernon Way and Swan Road. (The Sahuarita Corridor “closes” this loop on the south). Houghton Road meets ten of the eleven criteria for a
3. Is this route primarily designed to carry through traffic? (Per State Transportation Board Policy No. 5)
   Yes, this route is access-controlled currently, and the extension is planned to be access controlled. This extension is estimated to attract approximately 3,000 through trips per day between I-10 (near downtown) and I-10 (near the Valencia Road area). This represents between 4% and 20% of the trips on the corridor.

4. Does this route connect Arizona’s population centers? (State Transportation Board Policy No. 5)
   Yes, it connects the central Tucson business district with the Davis-Monthan Air Force Base and I-10, and would provide access to the airport area.

5. Does this route interconnect with those of other states? (State Transportation Board Policy No. 5)
   No, it does not connect 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, with a high capacity connecting route through downtown Tucson, it will form an efficient network. It will provide a connecting link to Alvernon Way and areas to the north from I-10.

7. Does this route provide statewide and regional movement of people and goods? (State Transportation Board Policy No. 16)
   Yes, this route provides regional movement of persons and goods by facilitating travel from the downtown area of Tucson to the southeast area of Tucson.

8. Is this route designated as Interstate Highway or Urban freeway? (Per Route Transfer and Level of Development Study)
   Yes and No. The existing Barraza-Aviation parkway is classified as an urban other freeway. The extension of the Barraza-Aviation Parkway has not been classified. When constructed, it will likely be classified as an urban other freeway.

9. Does this route meet criteria for “other Major facilities” (Per Route Transfer and Level of Development Study), which includes:
   - 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 (e.g. state highway) routes

   Yes, the Barraza-Aviation Parkway is an urban connecting route to Interstate-10. It will also connect to Valencia Road (a state route) at the south end of the route, Golf Links Road (a state route), and Alvernon Way (a state route).

10. Does this route meet criteria for “other statewide routes” (Per Route Transfer and Level of Development Study), which includes:
    - 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

Yes, this extension will provide a connecting route necessary to form a network to connect I-10.

11. Does this route meet criteria for “Non-Statewide routes” serving points of state and national interest. (Per Route Transfer and Level of Development Study).

Yes, this route serves points of statewide and national interest including Davis-Monthan Air Force Base, and the downtown governmental center of Tucson, the Pima Air and Space Museum, and the Tucson International Airport. Between Broadway Boulevard and Alvernon Way, the Barraza-Aviation Parkway is a part of the Major Strategic Corridor Network (STRAHNET), which is identified by the Department of Defense in cooperation with USDOT. These routes are designed to mobilize resources for national defense. It is also designated as a National Highway System route.

Conclusions
The extension of the Barraza-Aviation Parkway meets all the criteria for a state highway, with the exception of Criteria 1 (Designation of a State Route), Criteria 5 (Interconnection Route with Those of Other States), Criteria 8 (Designation as an interstate highway or urban freeway). Criteria 1 and 8 are not met because the planned extension of the Barraza-Aviation Parkway is not classified as an urban freeway. Prior to being considered further as a State Highway, this extension must be designated as a state route.
state highway, with the exception of Criteria 5 (*Interconnection Route with Those of Other States*). As part of this special focus Loop Corridor, Houghton Road would qualify as a state highway, because it is a projected high volume route serving as an important linkage between I-10, and the Sahuarita Corridor (if designated as a state highway), and the Southlands growth area.

Golf Links Road meets nine of the eleven criteria for a state highway, with the exception of Criteria 5 (*Interconnection Route with Those of Other States*) and Criteria 9 (Criteria for “Other Major Facilities”). 2030 traffic volume projections indicate Golf Links Road is projected to attract high traffic volumes, indicating its importance as an east-west facility.

Alvernon Way/Swan Road meets all the criteria for a state highway, with the exception of Criteria 5 (*Interconnection Route with Those of Other States*) and Criteria 9 (Criteria for “Other Major Facilities”). Criteria 1 (*Designation of a State Route*) is partially met (Alvernon Way has been designated as a state route, Swan Road has not been designated) and Criteria 8 (*Designation as an interstate highway or urban freeway*) is partially met. It fully meets seven of the eleven criteria.

**Barraza-Aviation Corridor Extension, Golf Links Road to I-10**

The extension of the Barraza-Aviation Parkway meets all the criteria for a state highway, with the exception of Criteria 1 (*Designation of a State Route*), Criteria 5 (*Interconnection Route with Those of Other States*), Criteria 8 (*Designation as an interstate highway or urban freeway*). Criteria 1 and 8 are not met because the planned extension of the Barraza-Aviation Parkway is not classified as an urban freeway. Prior to being considered further as a State Highway, this extension must be designated as a state route. It fully meets eight of the eleven criteria.

A summary of how each route meets the state highway criteria is summarized in **Exhibit 6**.
## Exhibit 6 – Summary of State Route Criteria Compliance

<table>
<thead>
<tr>
<th>Criteria for State Highway Designation</th>
<th>Tangerine Road, I-10 to SR 77 with Direct Connection to I-10</th>
<th>Tangerine Road, I-10 to SR 77 with Direct Connection to Camino de Manana</th>
<th>East-West Alignment, via El Toro Road / Andrade Road</th>
<th>North-South Alignment via Wilmot Road/Kolb Road</th>
<th>Houghton Road, Golf Links to Andrade Road</th>
<th>Golf Links Road, Aviation Parkway to Houghton Road</th>
<th>Alvernon Way/Swan Road, Aviation Parkway to El Toro Rd</th>
<th>Barraza-Aviation Corridor Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has this road been designated as a state route?</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
</tr>
<tr>
<td>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?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Is this route primarily designed to carry through traffic?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4. Does this route connect Arizona’s population centers?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>5. Does this route interconnect with those of other states?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6. Is this route a high capacity connecting route needed to form an efficient network?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>7. Does this route provide statewide and regional movement of people and goods?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>8. Is this route designated as Interstate Highway or Urban freeway?</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes/No* (criteria partially met)</td>
</tr>
</tbody>
</table>
| 9. Does this route meet criteria for “other major facilities” including:  
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 | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 10. Does this route meet criteria for “other statewide routes” including:  
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 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 11. Does this route meet criteria for “non-statewide routes” serving points of state and national interest | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Total Number of Criteria Fully Met** | 10 | 8 | 8 | 8 | 10 | 9 | 7 | 8 |
4.2 Recommendations

The following recommendations are made regarding advancement of discussions with the State Transportation Board on the designation of special focus corridors as state highways.

1. Discuss the contents of this Working Paper with representatives of the ADOT Transportation Planning Division and the ADOT Tucson District staff to determine the view of ADOT with respect to advancing a recommendation to the State Transportation Board regarding State Highway designation, and to discuss funding and programming issues. Key elements of ARS 28-7041 include the requirement that a road must be recommended to the Board by the ADOT Director of Transportation to be designated a state highway. Additionally, per ARS 28-7043, 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 State Transportation Board as a state highway, the department (ADOT) shall maintain the highway. For these reasons, ADOT Planning Division participation is essential.

2. Discuss the contents of this paper with the Tucson Representative to the State Transportation Board to determine the process to designate, approve, fund and program new state highways into the State Highway System.

3. Discuss the contents of this paper with the affected jurisdictions who are currently maintaining the affected roadways. Statutory law (ARS 28-7043) requires that at least two weeks before the designation and acceptance by the State Transportation Board of a state route or portion of a state route as a state highway, the State 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. The county can appear before the board or petition the board to take over and designate a state highway. Therefore, local coordination is also a critical component of the designation process.
APPENDIX B
LETTERS

- ARIZONA STATE LAND DEPARTMENT
- PIMA COUNTY DEPARTMENT OF TRANSPORTATION
- PASCUA YAQUI TRIBE
September 1, 2006

Don Freeman
Transportation Engineer
Pima Association of Governments
177 N. Church Avenue, Suite 405
Tucson, Arizona 85701-1187

Subject: Comments on State Transportation System Mobility and Regional Feasibility Study; Draft Working Paper 3, Corridor Needs, Performance and Feasibility Study (Loop Road Study), Kimley-Horn and Associates, Inc.

Dear Mr. Freeman:

We wish to thank PAG for the opportunity to review and comment on the Loop Road Study and the time extension for submitting our comments. We have addressed Working Paper No. 3 in two parts: part one focuses on the study and part two addresses future Arizona State Land Department (ASLD) involvement with PAG studies involving Trust land.

I. Draft Working Paper No. 3 (Loop Road Study). Our analysis was done based on the following elements:

- Existing land ownership
- Topography
- Major washes
- Floodplain
- Water recharge facilities
- Biological corridors and critical habitat
- Riparian
- Sensitive Cultural areas
- Population projections
- Land use projections

ASLD agrees with the study purpose, scope and methodology. In light of the established criteria, the most significant to ASLD noted herein, ASLD remains concerned about the conceptual status of the criteria, especially with regard to land use, drainage and critical habitat. In general, we agree with the loop concept and the existing roadways perceived to be components thereof. We remain concerned about future roadway alignments and their impact on the above mentioned criteria.

“Serving Arizona’s Schools and Public Institutions Since 1915”
Page 2
September 1, 2006
Don Freeman

We agree that merely identifying corridors/alignments is insufficient to provide for implementation. We believe local tools identified in the report are insufficient for this purpose. Advantage should be taken of the fact that the vast majority of land is Trust land. Accordingly, conceptual plans adopted by the committee should be considered before future alignment recommendations are made. ASLD also agrees that consideration should be given to multi-modal corridors.

II. Considerations for Future ASLD Involvement in PAG, in General, including, but not limited to Transportation Matters.

- Approximately 80% of the undeveloped land in the region is under single ownership (ASLD.) This represents a unique opportunity in efficiency and technical resources.

- Under Arizona law the Arizona State Land Commissioner is mandated to create both conceptual and/or development plans on all State land. Much of the (analysis) in these plans should be considered by any regional planning agency or authority.

- ASLD, to date, has not been intimately involved in PAG due, in part, to a lack of agency resources. With the establishment of the Tucson Office, a major component of efforts and staffing will involve regional planning matters.

- The Arizona State Land Department’s Southern Arizona Real Estate Office should be an official component in terms of input, evaluation, and approval on all matters relating to Trust land. We remain open to suggestions to how this may be accomplished.

Sincerely,

W. Dempsey Helms
Engineering Coordinator
Southern Arizona Real Estate Division

CC: Gary Hayes, Executive Director of PAG and RTA
    Ronald P. Ruziska, Director of Southern Arizona Real Estate Division
September 27, 2006

Ms. Mary Rodin
Kimley-Horn and Associates, Inc.
Suite 100
1860 East River Road
Tucson, AZ 85718

Subject: Draft Working Paper #3 - Corridor Needs, Performance and Feasibility
State Transportation System Mobility and Regional Circulation Needs Feasibility Study

Dear Ms. Rodin,

We appreciate the opportunity to review Working Paper #3 and offer the following comments:

Pima County supports regional efforts to improve mobility in a manner that minimizes socioeconomic and environmental impacts. The conceptual roadway alignments identified in this study present physical, financial, and environmental challenges that will have to be addressed in future studies. Public comment will also be required before final roadways and alignments are chosen and financial commitments are made. Until further studies are completed and public comment is obtained, it would be premature for Pima County to add these routes to our Major Streets and Scenic Routes Plan at this time.

Since 1998, when the Sonoran Desert Conservation Plan (SDCP) was initiated, Pima County has been particularly committed to preserving open space and protecting important biological habitat. The SDCP designates specific areas for special species management and scientific research. As part of the SDCP, the Conservation Land System (CLS) includes land categories for multiple use management areas, important riparian areas, and biological core management areas. Currently, programmed Pima County roadway projects that could impact any of the CLS areas require additional study, review, and mitigation measures as specified in Chapter 4 of the Pima County Roadway Design Manual, titled Environmentally Sensitive Roadway Design Guidelines. Both direct and indirect impacts such as the induced effects of a new roadway on habitat and special species are studied.

Future roadways that could impact the Conservation Land System and resources identified in the Sonoran Desert Conservation Plan would require additional studies to identify and quantify those impacts, consider various alternatives and alternative alignments, and propose mitigation measures. Pima County would evaluate those studies and make recommendations based on the information learned. The preliminary environmental screening provided in Working Paper #3 provides a basis for what questions to ask and what issues to study.

The proposed La Cholla Parkway is not supported by County Administration. The proposed alignment would impact the planned expansion of the Tortolita Mountain Park, as well as impact important cultural and biological resources. Pima County has made expansion of this park a priority through the 2004 General Obligation Bond Program, which allocated approximately $29 million of $174 million toward open space acquisition and/or conservation easements in the Tortolita Mountains area.
Ms. Mary Rodin  
Kimley-Horn and Associates, Inc.  
Draft Working Paper #3 – Corridor Needs  
Page 2

In addition to general comments above, we offer the following specific comments to Draft Working Paper #3:

1. Page 41-42, Table 3-8. Add “Special Species Management Area” to the impacts of both the Western Freeway Loop and La Cholla Parkway. Add “Biological Core” impacts to both the Southern Freeway Loop and Houghton/Golf Links Parkway.

2. Page 51, Table 3-11. Does the Western Freeway Loop impact Ironwood Forest National Monument?

3. Page 52, Figure 3-13. Add Tortolita Mountain Park Expansion Area to this map. Should this map include Ironwood Forest National Monument?

4. Page 56, Table 3-13. Add “special species management areas” to the constraints column of the Western Freeway Loop, Southern Freeway Loop, and La Cholla Parkway. Add “Potential Section 4(f) impacts to the Western Freeway Loop, if applicable.

5. Page 63. The fact that Pima County has recently widened La Cholla Boulevard to 6 lanes from Omar Drive to River Road does not, in and of itself, support the “need” to extend La Cholla Boulevard north of Tangerine Road. Similarly, the fact that Pima County plans to widen Valencia Road does not, in and of itself, support the “need” for the Western Freeway Loop. Wording of the first paragraph on this page should be clarified.

Sincerely,

Priscilla S. Cornelio, P.E.  
Director

c. Cheri Campbell, Pima Association of Governments  
Arlan Colton, Planning Official, Development Services Department  
Ben Changkakoti, Principal Planner, Development Services Department  
Benjamin H. Goff, Deputy Director, Transportation Department  
Ana M. Olivares, Deputy Director, Transportation Department  
Jonathan Crowe, Principal Planner, Transportation Department
October 23, 2006

Mary Rodin, AICP
Loop Study Project Manager, Kimeley-Horn and Associates
1860 East River Road
Tucson, AZ 85718

Dear Ms. Rodin,

Thank you for the meeting of Wednesday, September 27th and the information provided. We are pleased that the Tribe’s comments below have been identified and will merit consideration in the final document, specifically:

- The Tribe is to be noted as Major Land Owner Within Western Corridor Loop Table 3-1
  - Ninety (90) acres Valencia frontage property recently purchased from the State-likely to move into commercial use
  - Approximately ninety (90) acres Valencia frontage, trust-status, properties under development (20% improved) for retail and commercial purposes including Casino del Sol and planned Hotel
  - Tortuga Ranch land holdings are approximately 6,400 acres in fee and 23,000 acres in State and BLM lease status accessible from Sandario Road or proposed loop.

As the study moves into its next Phase we would encourage and support visionary efforts that are cognizant, responsive, and evade negative affects to the region. Furthermore, the importance of considering phased-development approach is recognized to ensure we are doing everything today that supports the regional vision. As such, a conversation of corridor access management is equally important as any alignment studies that may be furthered.

In any case, we hope the Pascua Yaqui Tribe will be included as a partner to these regional efforts. Please feel free and contact our office if we may answer any questions.

Thank you.

Sincerely,

Carl Russell, Director of Development Services