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# PICTURE ROCKS

## MULTIMODAL TRANSPORTATION STUDY

## Executive Summary

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PREPARED FOR: **ADOT** AND



PREPARED BY:  
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## Study Background and Purpose

Citizens for Picture Rocks is a community advocacy group representing the Picture Rocks Fire Department, Pima County Sheriff's Department, Picture Rocks American Association of Retired Persons (AARP), Picture Rocks Elder Initiative, and other community stakeholders. The group approached Pima County representatives to express concerns regarding transportation issues in the community. These concerns related to lack of transit service, safety-related issues, and the need for pedestrian and bicycle facilities. As a result, with a letter of support from the Citizens for Picture Rocks, Pima County submitted an application to the Arizona Department of Transportation (ADOT) Planning Assistance for Rural Areas (PARA) Program to conduct a multimodal transportation study to address transportation issues in the community.

The purpose of the Picture Rocks Multimodal Transportation Study is to identify the most critical multimodal transportation infrastructure and service needs within the Picture Rocks study area and recommend a program of short-range (0-5 years), mid-range (6-10 years), and long-range (11-20 years) improvements that address:

- Roadway safety: improve safety through recommendations for shoulder improvements, geometric improvements, and traffic control;
- Regional access and mobility: address the identified needs and deficiencies that improve local and regional mobility and circulation;
- Bicycle and pedestrian safety and mobility: projects for sidewalks, paths, and shoulders to accommodate bicyclists and pedestrians; and
- Rural transit service: confirm the need for and provide recommendations for transit service.

## Study Objectives

The study findings will serve as a guide for community and economic development, project funding applications and grants, and project implementation.

Study activities include the following:

- Collect and review existing and future conditions related to traffic volumes, crashes, socioeconomic and demographic conditions, and roadway conditions;
- Evaluate the performance of the transportation system and document needs and deficiencies;
- Project future transportation needs for 5-, 10-, and 20-year planning horizons;
- Evaluate the need and opportunities for providing rural transit service; and
- Recommend improvements that address the identified needs and deficiencies.

## Study Area

Picture Rocks, Arizona is located in unincorporated Pima County approximately 20 miles northwest of the City of Tucson. The community is located west of the Tucson Mountains. The study area borders the southern town limits of Marana and is adjacent to Saguaro National Park (SNP). A study area map is shown in **Figure 1**.

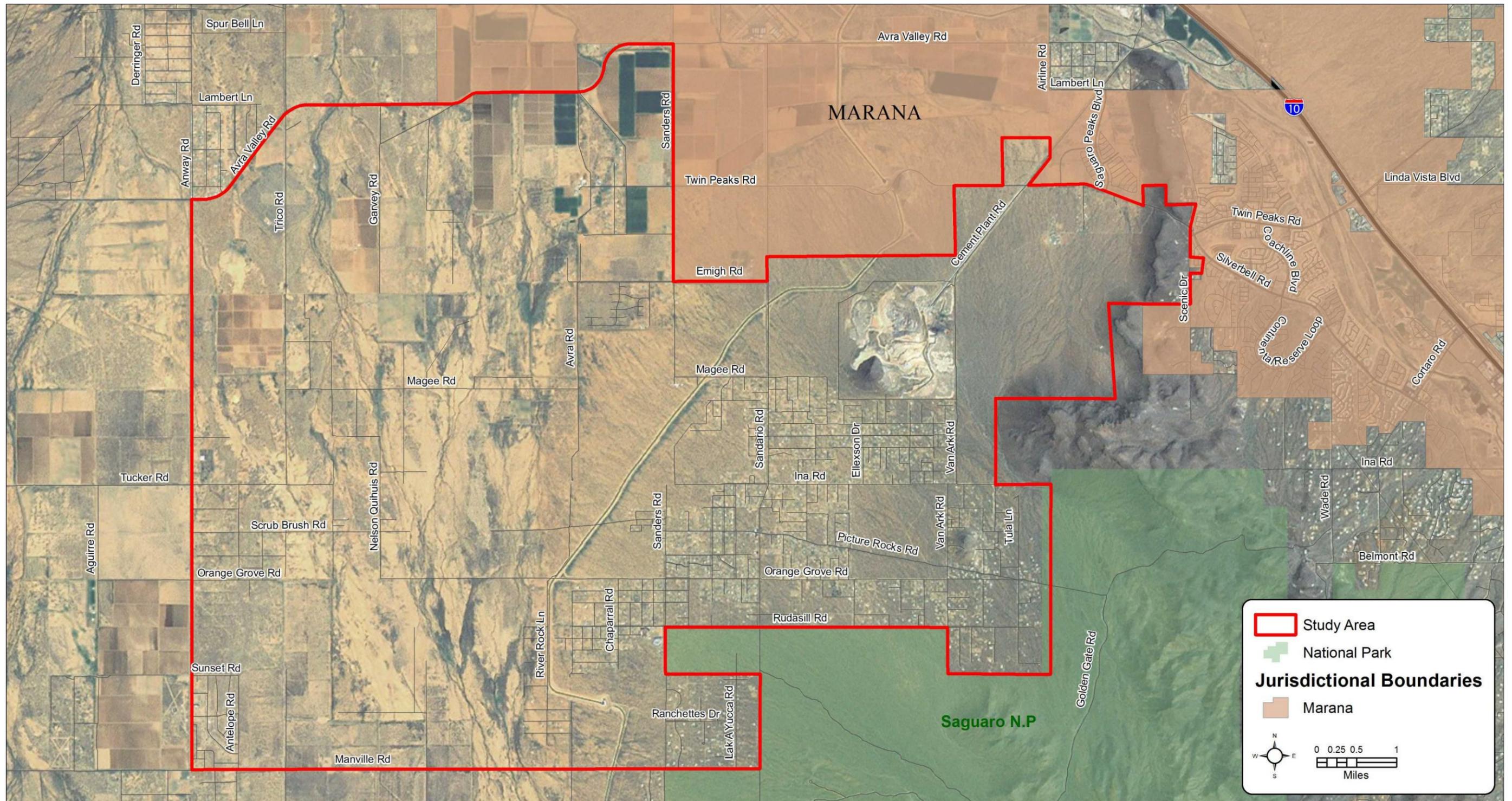


Figure 1 – Study Area Map

## Multimodal Transportation Needs

Needs resulted from assessments of the following information and analyses:

- Stakeholder input from the Technical Advisory Committee (TAC), civic groups, and the general public;
- Completed and ongoing plans and studies;
- Traffic data analysis;
- Crash data analysis;
- Transit ridership analysis;
- Community and environmental resources; and
- Field review of road and pavement conditions.

The needs were organized into the following categories:

- Planning and engineering studies;
- Transportation infrastructure;
- Roadway-flooding mitigation;
- Alternate transportation modes; and
- Roadway maintenance.

## Recommended Projects

The projects recommended address the transportation needs to improve roadway safety, regional access and mobility, bicycle and pedestrian safety and mobility, and rural transit service.

A summary of recommended projects is:

**Planning and Engineering Studies** -Recommended planning and engineering studies are:

- **Hydrologic studies** - Mitigation of flood-prone areas to reduce road closures for area residents and improve accessibility for emergency service providers are among the highest priority needs expressed by stakeholders. Hydrological studies should review past drainage studies (Brawley Wash drainage studies) to confirm roadway locations that are prone to flooding and to estimate project limits, depths of flow, and flow rates. These studies should determine priorities and implementation strategies that minimize flooding impacts on access.
- **Diagnostic safety studies** - A review of crash locations in the study area identified a number of road segments and intersections with high concentrations of total and injury crashes. Limited crash analyses and field visits were conducted in support of project recommendations. Road Safety Assessments are recommended in a number of areas.
- **Traffic studies** - A number of locations in the study area were identified by stakeholders as needing operational, traffic control, and/or safety improvements. Traffic studies are needed to confirm the need for changes in traffic control or to supplement diagnostic crash studies.

**Roadway Infrastructure Projects** - Eleven roadway infrastructure projects along with related planning and engineering studies were developed to address the infrastructure needs. These projects are shown in **Figure 2**.

**Pavement Maintenance and Rehabilitation Projects** - Pavement preservation priorities for future updates of the annual pavement preservation and rehabilitation program were identified from 2013

pavement conditions data collected by Pima County as part of the Annual Pavement Preservation and Rehabilitation Program. Pavement priorities include County maintained roadway segments with predominant pavement rating of “poor” or “fair.” These priority segments will require further scoping to determine the preservation techniques such as structural overlay or mill/fill. The estimated cost is \$140,000/mile for structural overlay and \$200,000/mile for mill/fill. These costs were determined from similar completed and planned pavement preservation projects in the study area. Because the County Pavement Preservation and Rehabilitation Program is dependent on the availability of funds, pavement preservation priorities shown in **Figure 3** should be considered in future annual programs

**Recommended Transit Project** - Future transit service in the Picture Rocks area is dependent upon funding. Commitment of local funding is decided by PAG in consideration of regional needs and priorities. If funding can be identified, it is recommended that a new Transit Route from Picture Rocks Community to Sun Shuttle Route 411 and Route 104X at Arizona Pavilions Shopping Area near the Cortaro Road /I-10 interchange. This service would operate four hours per day, Monday through Friday with approximately 30-minute headways. Providing peak-hour service to the Arizona Pavilions area will help to encourage and grow ridership demand, while providing a cost-effective service. A summary of the key features of this route is provided in **Table 1**.

**Table 1 – Recommended Transit Alternative**

Service Alternative	Need for ADA Complementary Paratransit Service	Service Area Characteristics	Passenger Needs	Costs	Other Comments
<b>Alternative 2B</b> - Express transit route to Route 411 and Route 104X at Arizona Pavilions Shopping Center – peak period only.	Sun Shuttle vehicles are equipped with lifts. Typically each Sun Shuttle carries two personal mobility devices.  ADA complementary paratransit service is required and would likely need to be provided through a route-deviated service.	Streets served: <ul style="list-style-type: none"> <li>• Twin Peaks Road (Silverbell Road to Sandario Road)</li> <li>• Sandario Road (Twin Peaks Road to Rudasill Road)</li> <li>• Rudasill Road (Sandario Road to Sanders Road)</li> <li>• Sanders Road (Sunset Road to Picture Rocks Road)</li> <li>• Orange Grove Road (Sanders Road to Sandario Road)</li> <li>• Arizona Pavilions area</li> <li>• Shopping plaza at Twin Peaks Road/Coachline Road</li> </ul>	This express route provides service to the Marana-Downtown Express (Route 104X) at the Arizona Pavilions.	Operating and administrative costs=\$49,140  Capital costs for system start up: \$318,900 - \$423,900	According to the PAG Short Range Transit Implementation Plan 2014-2018, Sun Shuttle fixed routes all follow a standard threshold of two passengers per revenue hour.  This route is estimated to have 5,638 passengers / 1,040 revenue hours = 5.42 passengers /revenue hour.

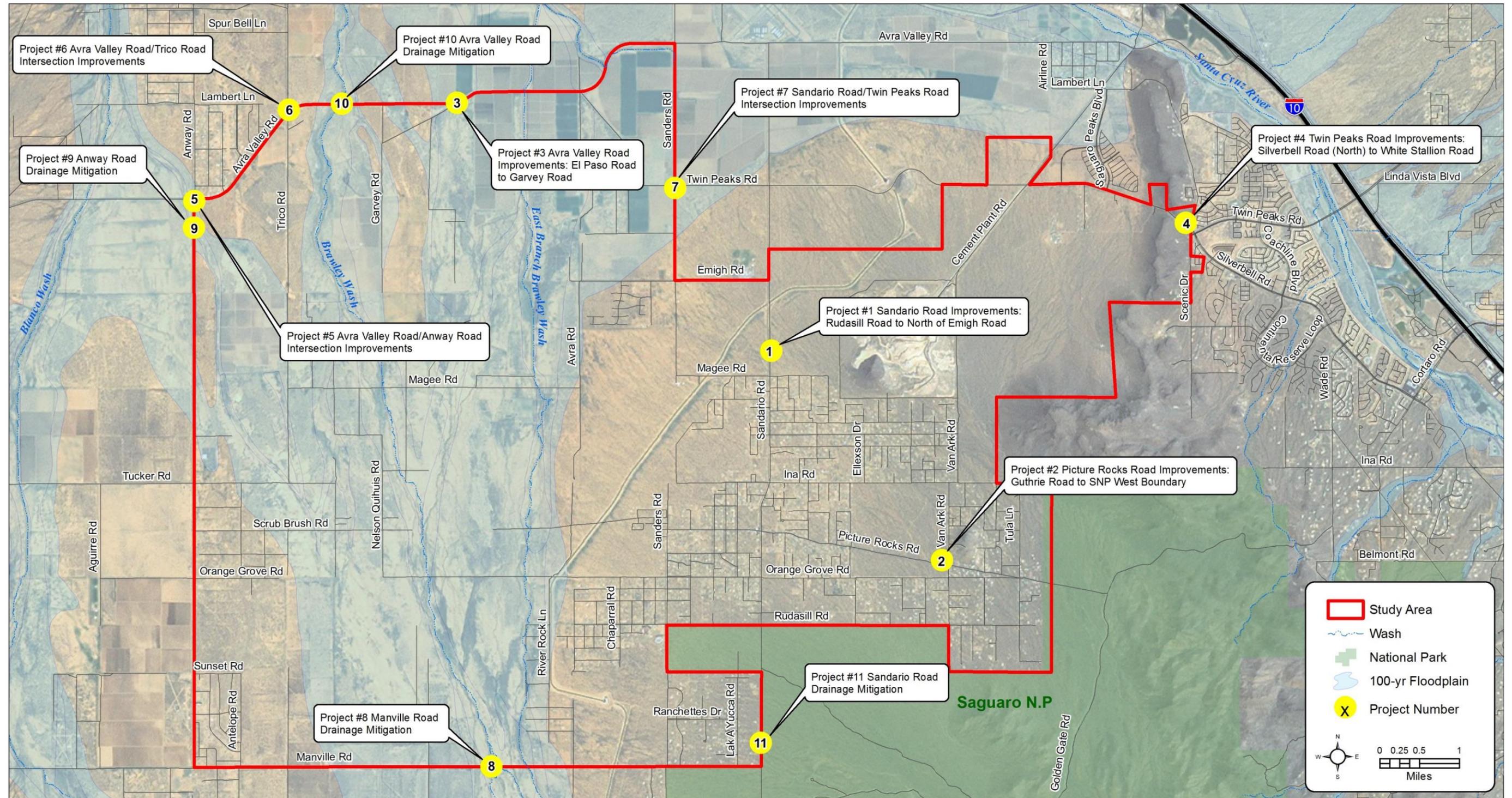
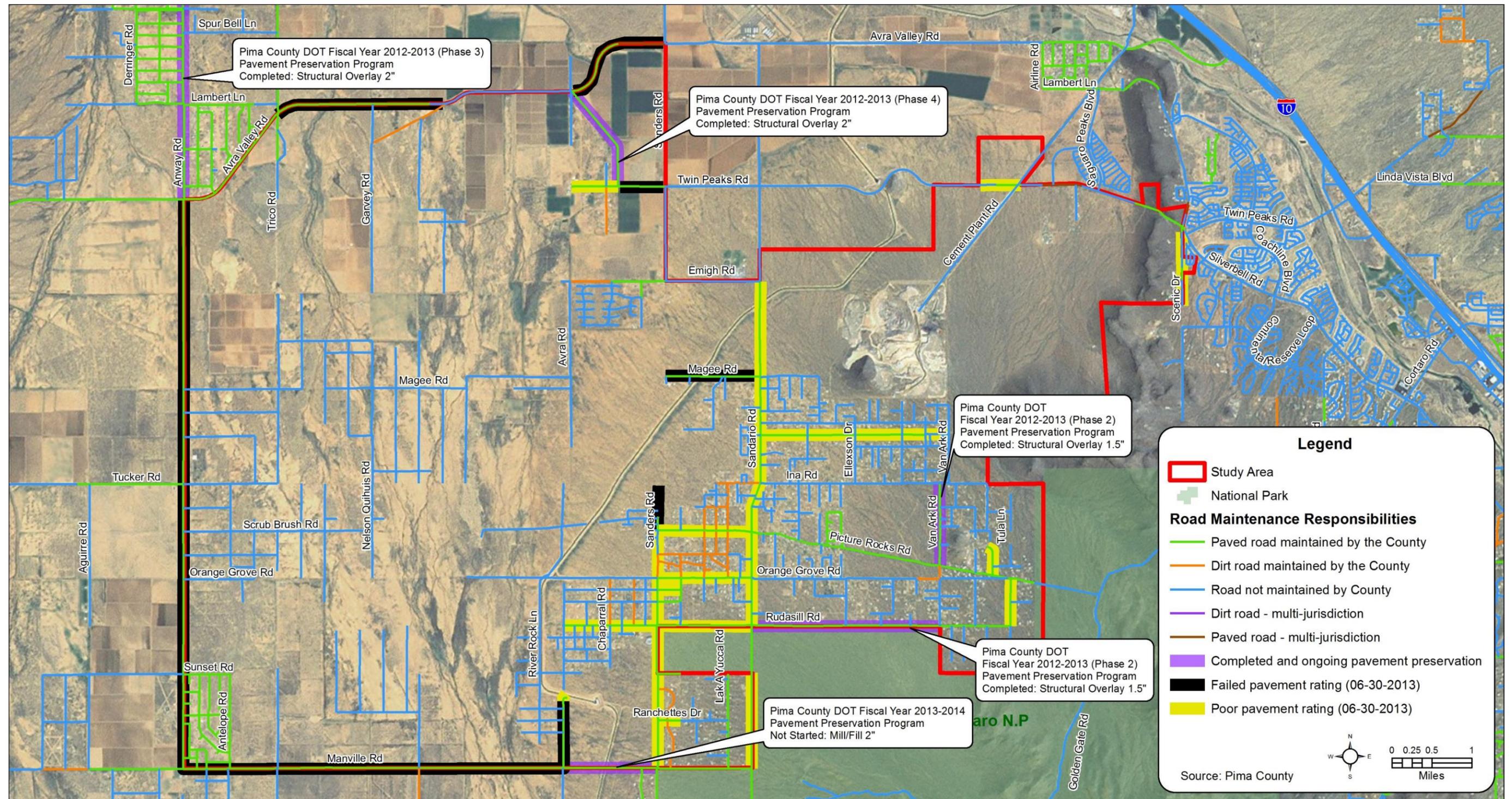


Figure 2 – Recommended Infrastructure Projects



Source: Pima County

**Figure 3 – Pavement Preservation Priorities**

## Project Prioritization and Plan of Improvements

Project performance criteria were developed to provide a basis for establishing near-term infrastructure project priorities. Long-term projects which require higher construction costs will be dependent on funding availability and to the outcome of studies that are recommended for project scoping. The performance criteria include measurable factors representing the goals of the Picture Rocks Study. These criteria cover three categories—study area multimodal mobility and safety, regional multimodal accessibility, and study area economic development and quality of life. The performance criteria are summarized below.

### Study Area Multimodal Mobility and Safety

- Improved Multimodal Mobility within the Picture Rocks Community
- Improved Multimodal Safety
- Improved Traffic Operations

### Regional Multimodal Accessibility

- Improved Regional Multimodal Connections
- Increased Travel Choices

### Study Area Economic Development and Quality of Life

- Improved Potential for Community Development
- Improve Quality of Life/Air Quality

Performance criteria were rated for each infrastructure project on the following quantitative rating scale to illustrate the benefits of each project.

## PROJECT PRIORITIES

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Using the results of project priority matrix, infrastructure projects were assigned to short-range (0 to 5 years), mid-range (6 to 10 years), and long-range (11 to 20 years) time frames to maximize benefit to the Picture Rocks Community. Pima County should consider these priorities in future updates of the Transportation Improvement Program and the Long-Range Transportation Plan. These projects are summarized in **Table 2**. The planning-level cost estimates shown in **Table 2** include general costs for items typically associated with similar types of projects.

**Table 2- Summary of Infrastructure Projects**

Project Number	Project Name	Project Features	Preliminary Project Cost (\$)	Project Phasing
1	Sandario Road, Rudasill Road to North of Emigh Road	<b>Studies</b>		
		<ul style="list-style-type: none"> <li>Conduct planning and engineering studies to evaluate the need for left-turn lanes at intersections on Sandario Road-Picture Rocks Road.</li> </ul>	\$5,000	Short-range
		<ul style="list-style-type: none"> <li>Conduct planning and engineering studies to evaluate need for intersection operations, geometric, traffic control, and lighting improvements at Sandario Road / Picture Rocks Road intersection.</li> </ul>	\$5,000	
		<ul style="list-style-type: none"> <li>Conduct hydrology study to evaluate the need, feasibility, and preliminary concepts plans for improvements to wash crossing on Sandario Road;</li> <li>Consider placement of near-term warning and detour signs in advance of roadway reconstruction.</li> </ul>	\$50,000	
		<ul style="list-style-type: none"> <li>Conduct a study to develop a planning framework for street design and land use zoning along Sandario Road from Ina Road to Orange Grove Road. The street design framework should include pedestrian and equestrian-scale streetscape consistent with Pima County Comprehensive Plan Special Area Policies. Street elements should encourage slower traffic speeds and may include on-street parking, sidewalks, planters, and street trees. Potential cross-sections are shown in <b>Figure 22</b>.</li> </ul>	\$50,000	
		<ul style="list-style-type: none"> <li>Monitor crash history and traffic operations at the Orange Grove Road and Rudasill Road intersections to determine the need for geometric, operational, traffic control, and roadway lighting improvements.</li> </ul>	-	
		<b>Improvements</b>		
	<ul style="list-style-type: none"> <li>Construct shared-use path from Sandario Road / Picture Rocks Road intersection to Emigh Road (Marana High School).</li> <li>Coordinate with fire district on funding to install a pre-emption traffic signal at fire station.</li> <li>Upgrade traffic control signs and markings; implement speed control devices and/or speed enforcement.</li> </ul>	\$2,500,000	Mid-Range	
	<ul style="list-style-type: none"> <li>Construct all-weather three-lane roadway with paved (bikeable) shoulders from Ina Road to Orange Grove Road. Design should include intersection and drainage improvements as determined by planning and engineering studies.</li> </ul>	\$3,500,000	Long-Range	

Project Number	Project Name	Project Features	Preliminary Project Cost (\$)	Project Phasing
2	Picture Rocks Road, Guthrie Road to SNP West Boundary	<b>Studies</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) and engineering study to evaluate the need for left-turn lanes and operations, geometric, traffic control, and lighting improvements at Sandario Road / Picture Rocks Road intersection and other intersections with the corridor between Stone Mountain Road and SNP boundary.</li> </ul>	\$30,000	Short-Range
		<ul style="list-style-type: none"> <li>Conduct hydrology studies to evaluate the need for improvements to wash crossing on Picture Rocks Road including placement of near-term warning and detour signs in advance of roadway reconstruction.</li> </ul>	\$50,000	
		<ul style="list-style-type: none"> <li>Conduct a study to develop a planning framework for street design and land use zoning along Picture Rocks Road from Guthrie Road to Stone Mountain Road. The street design framework should include pedestrian and equestrian-scale streetscape consistent with Pima County Comprehensive Plan Special Area Policies. Street elements should encourage slower traffic speeds and may include on-street parking, sidewalks, planters, and street trees.</li> </ul>	\$50,000	
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade traffic control signs and markings.</li> <li>Implement speed control devices and/or speed enforcement.</li> </ul>	\$20,000	
		<ul style="list-style-type: none"> <li>Construct all-weather three-lane roadway with paved (bikeable) shoulders from Guthrie Road to Stone Mountain Road. Design should include intersection and drainage improvements as determined by planning and engineering studies.</li> </ul>	\$3,500,000	Long-Range
3	Avra Valley Road—El Paso Road to Garvey Road	<b>Studies</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) to determine the need and feasibility to install roadway lighting, reduce the posted speed limit, and other improvements required to improve safety of this roadway segment.</li> </ul>	\$20,000	Short-Range
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade existing advance warning signs on Avra Valley Road with larger signs and warning beacons on approaches to the El Paso Road and Garvey Road intersections. Relocate sign placement on approaches to intersections and curves.</li> <li>Increase the size of existing stop signs at the El Paso Road and Garvey Road intersections.</li> <li>Remove sight distance restrictions at the El Paso Road and Garvey Road intersections.</li> </ul>	\$300,000	
		<ul style="list-style-type: none"> <li>Reconstruct the El Paso Road approach to Avra Valley Road.</li> <li>Construct left-turn lanes on Avra Valley Road at El Paso Road and Garvey Road intersections.</li> </ul>	\$1,500,000	Mid-Range

Project Number	Project Name	Project Features	Preliminary Project Cost (\$)	Project Phasing
4	Twin Peaks Rd —Silverbell Rd (North) to White Stallion Rd	<b>Study</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) to identify other improvements required to improve safety of this corridor segment.</li> </ul>	\$20,000	Short-Range
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade existing advance warning signs on the Twin Peaks Road with larger signs and warning beacons on approaches to the Silverbell Road (north). Relocate sign placement on approaches to intersections and curves.</li> <li>Grade shoulders to remove pavement-shoulder differential.</li> <li>Remove sight distance restrictions at the Twin Peaks Road-White Stallion Road intersection.</li> </ul>	\$400,000	
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Reconstruct the Twin Peaks Road-Silverbell Road (North) T-intersection and curve geometry on Twin Peaks Road.</li> <li>Construct a left-turn lane on Twin Peaks Road at White Stallion Road.</li> </ul>	\$2,000,000	Mid-Range
5	Anway Rd / Avra Valley Rd	<b>Studies</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) of Avra Valley Road from Anway Road to Trico Road to determine the need for reducing the posted speed limit and other improvements required to improve safety at this intersection.</li> </ul>	\$20,000	Short-Range
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade existing advance warning signs on the Avra Valley Road with larger signs and warning beacons on approaches to Anway Road. Relocate sign placement on approaches to intersection.</li> <li>Remove sight distance restrictions.</li> </ul>	\$300,000	
		<ul style="list-style-type: none"> <li>Construct left-turn lanes on Avra Valley Road or conduct studies to determine the need to transition to all-way stop control.</li> <li>Realign the Anway Road approaches to the intersection.</li> </ul>	\$2,500,000	Mid-Range

Project Number	Project Name	Project Features	Preliminary Project Cost (\$)	Project Phasing
6	Avra Valley / Trico Rd	<b>Studies</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) of Avra Valley Road from Anway Road to Trico Road to determine the need for intersection lighting and reducing speed limit</li> </ul>	See Project #5	Short-Range
		<ul style="list-style-type: none"> <li>Conduct flood mitigation study to identify improvements required to mitigate flood-prone areas to reduce road closures for area residents and improve accessibility for emergency service providers.</li> </ul>	\$50,000	
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade existing advance warning signs on Avra Valley Road with larger signs and warning beacons on approaches to Avra Valley Road. Relocate sign placement on approaches to intersection; remove sight distance restrictions at the intersection.</li> </ul>	\$20,000	
		<ul style="list-style-type: none"> <li>Construct left-turn lanes on Avra Valley Road at Trico Road and Voak Road intersections and construct a right-turn lane on Trico Road (southbound approach) or conduct studies to determine the need to transition to all-way stop control.</li> <li>Realign the Trico Road approaches to the intersection.</li> </ul>	\$2,000,000	Mid-Range
7	Sanders Road / Twin Peaks Road	<b>Studies</b> <ul style="list-style-type: none"> <li>Conduct Road Safety Assessment (RSA) to identify improvements required to improve safety at this intersection; determine the need for reducing the posted speed limit; evaluate need to transition to all-way stop control</li> </ul>	\$20,000	Short-Range
		<b>Improvements</b> <ul style="list-style-type: none"> <li>Upgrade existing advance warning signs on the Twin Peaks Road with larger signs with warning beacons approaches to the intersection. Relocate sign placement on approaches to intersection.</li> </ul>	\$10,000	
		<ul style="list-style-type: none"> <li>Reconstruct vertical geometry associated with the wash located on Twin Peaks Road east of the intersection.</li> </ul>	Additional study required	Mid-Range
8	Manville Road Drainage Mitigation Project	<b>Study</b> <ul style="list-style-type: none"> <li>Conduct hydrology study to evaluate the need for improvements to wash crossing on Picture Rocks Road including placement of near-term warning and detour signs in advance of roadway reconstruction.</li> </ul>	\$50,000	Short-Range
		<b>Improvement</b> <ul style="list-style-type: none"> <li>Construct all-weather crossing.</li> </ul>	\$4,500,000	Long-Range

Project Number	Project Name	Project Features	Preliminary Project Cost (\$)	Project Phasing
9	Anway Road Drainage Mitigation Project	<b>Study</b> <ul style="list-style-type: none"> <li>Conduct hydrology studies to evaluate the need for improvements to wash crossing on Picture Rocks Road including placement of near-term warning and detour signs in advance of roadway reconstruction.</li> </ul>	\$50,000	Short-Range
		<b>Improvement</b> <ul style="list-style-type: none"> <li>Construct all-weather crossing.</li> </ul>	\$1,500,000	Long-Range
10	Avra Valley Road Drainage Mitigation Project	<b>Study</b> <ul style="list-style-type: none"> <li>Conduct hydrology studies to evaluate the need for improvements to wash crossing on Picture Rocks Road including placement of near-term warning and detour signs in advance of roadway reconstruction.</li> </ul>	\$50,000	Short-Range
		<b>Improvement</b> <ul style="list-style-type: none"> <li>Construct all-weather crossing.</li> </ul>	\$1,500,000	Long-Range
11	Sandario Road Drainage Mitigation Project	<b>Study</b> <p>Conduct hydrology studies to evaluate the need for improvements to wash crossing on Picture Rocks Road including placement of near-term warning and detour signs in advance of roadway reconstruction.</p>	\$50,000	Short-Range
		<b>Improvement</b> <p>Construct all-weather crossing.</p>	\$1,500,000	Long-Range

## Funding Sources for Transportation Projects

Key funding sources for the multimodal transportation projects are:

**Highway User Revenue Fund (HURF)** - In Arizona, highway construction, operation, and maintenance are principally funded through state-shared revenues known as Highway User Revenue Funds (HURF). HURF revenues are generated by gasoline and use fuel taxes, motor carrier fees, vehicle license taxes, motor vehicle registration fees, and other miscellaneous fees. These revenues are distributed to the cities, towns, and counties of the state and to the State Highway Fund, which is administered by ADOT. These taxes and fees represent a source of revenues available for highway-related expenses.

**Federal Funding Sources** - Federal programs authorized under *Moving Ahead for Progress in the 21<sup>st</sup> Century* (MAP-21) include the Surface Transportation Program (STP), Highway Safety Improvement Program (HSIP), Federal Lands Transportation and Access Programs, Tribal Transportation Program, Railway-Highway Crossings (RHC), Transportation Alternatives (TA) Program, National Highway Performance (NHP) Program, and other relevant programs. Federal funding for transportation improvements is available through these programs, subject to eligibility requirements and approval by ADOT and the Federal Highway Administration (FHWA). Utilizing federal funds requires obtaining environmental, utility, and right-of-way clearances before proposed improvements can be implemented.

**Other Funding Sources** - Pima County adopted transportation impact fees (TIFs) in 1997. State law prohibits the use of TIFs on any highway improvements other than capacity improvements, and the roadway must be located in the unincorporated area of Pima County in geographic benefit areas. TIFs have limited applicability in the study area. TIFs have been used productively to augment transportation capacity improvements throughout Pima County.

## Public Outreach

To inform and involve community members of the study, two open houses were conducted for this study. The first open house was held at the Picture Rocks Community Center on Tuesday, February 18, 2014 from 5-7 p.m. The focus of this meeting was to obtain community input on needed transportation improvements. In addition to the open house, a presentation about the project was given to the Citizens for Picture Rocks Community Association; there was an opportunity for questions and answers, comments and recommendations on areas for improvement. In total, 21 members of the community were in attendance.

The second public open house for the project was held at the Picture Rocks Community Center on Tuesday, May 20, 2014 from 5:00 pm to 7:00 pm. The focus of this open house was to obtain public input on the recommended transportation improvement projects. In total, 16 members of the community were in attendance.