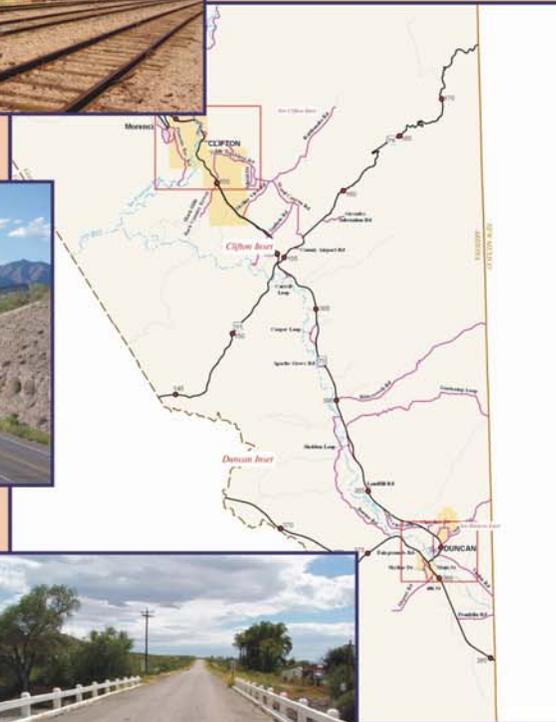
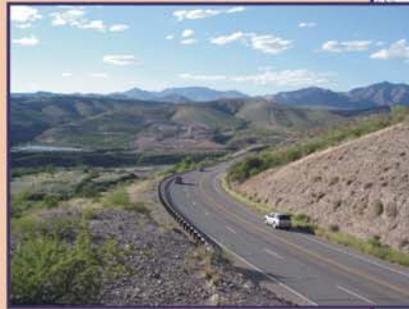
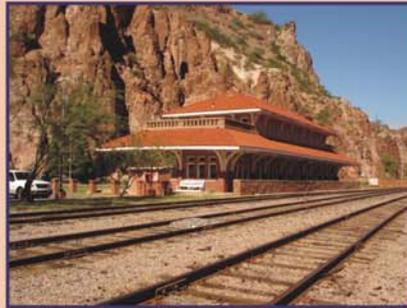




SOUTHERN GREENLEE COUNTY

SMALL AREA TRANSPORTATION STUDY

FINAL REPORT



LIMA & ASSOCIATES
Transportation - G.I.S.

JANUARY 2008

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1. INTRODUCTION AND SUMMARY OF FINDINGS

PURPOSE AND VISION

This Report presents the findings and recommendations of the Southern Greenlee County Small Area Transportation Study, and provides the County with a long-range multimodal transportation plan and practical tools for day-to-day programming and funding of transportation improvements. Figure 1 depicts the study area.

The Study developed 5-, 10-, and 20-year transportation plans for Southern Greenlee County by identifying deficiencies and recommending projects needed to improve mobility and safety and encourage tourism and development. The improvements were then prioritized to maximize project benefits within budget limitations. Funding strategies and potential funding sources are provided to enable the County to aggressively pursue local, regional, state, and federal funding.

BACKGROUND

Greenlee County is located in eastern Arizona bordering New Mexico. The county is 120 miles long and 20 miles wide, covers approximately 1,800 square miles and is sparsely populated with approximately 8,300 residents. The study area covers approximately 658 square miles. Clifton, the county seat, had an estimated 2005 population of 2,495. The 2005 estimated population of Duncan was 805 residents and the 2000 population of Morenci was 1,879. The majority of the land within the study area is owned by the U. S. Forest Service, Bureau of Land Management, or the State of Arizona. Individual or corporate lands account for around 20 percent of land ownership in the study area. The topography in the southern and central parts of the County consists of desert terrain bisected by river valleys. Further north, the County is mountainous and forested. Mining has been important to Greenlee County since the 1800's and continues to be the dominant part of the economy focused around the Freeport-McMoRan Copper & Gold Inc. (formerly Phelps Dodge) Mine in Morenci.

STUDY PROCESS

The study process is illustrated in Figure 2. The study was guided by a Technical Advisory Committee comprised of representatives from the County, the Towns of Clifton and Duncan, ADOT and the Southeast Arizona Association of Governments (SEAGO). An intensive public participation process was undertaken, including two rounds open houses to identify issues, solicit comments, and receive feedback on the study process and recommendations.

The first step of the technical analysis was to analyze the existing conditions and Environmental Justice concerns. Open houses in Clifton and Duncan were held to identify issues and vision components for the transportation plan. Stakeholders included County

FIGURE 1. SOUTHERN GREENLEE COUNTY STUDY AREA

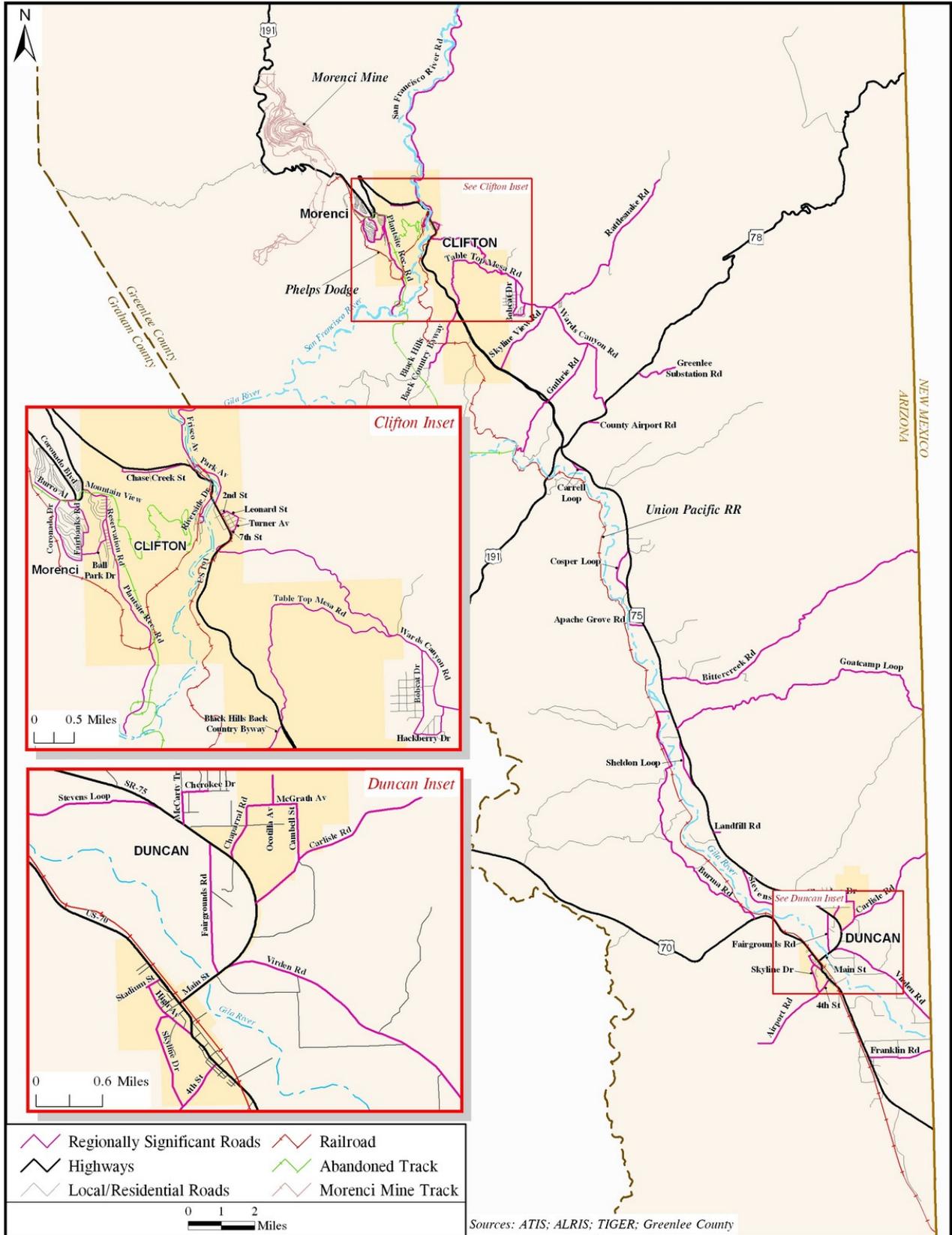
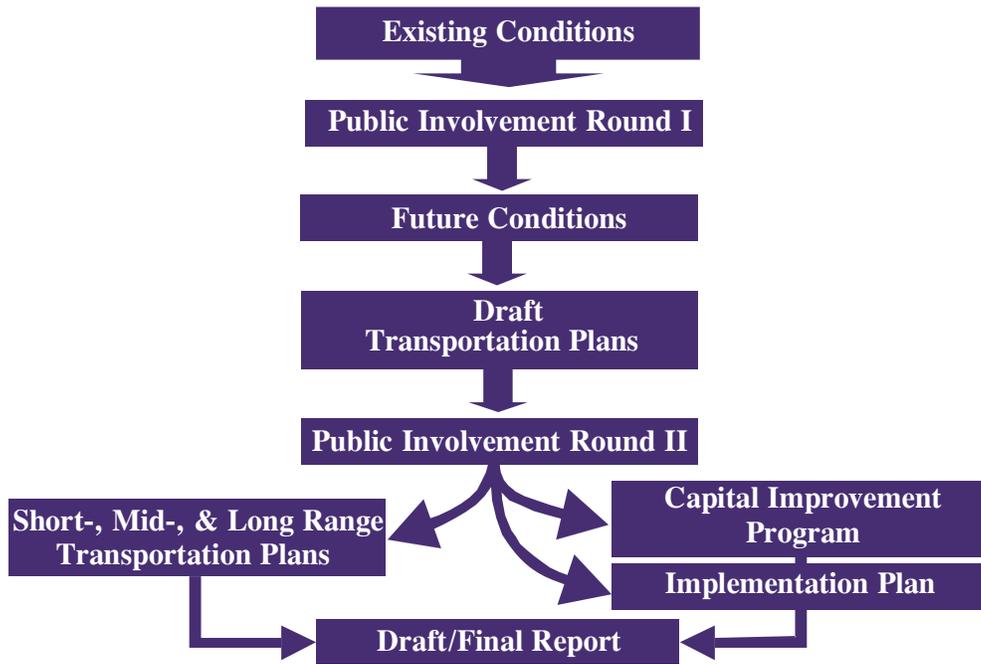


FIGURE 2. STUDY PROCESS



Supervisors, County Public Works Department personnel, elected officials from the Towns of Clifton and Duncan, town staffs, ADOT and SEAGO representatives, and citizens.

The next major step in the technical process was to analyze alternative roadway improvements. Based on the results of this analysis, a draft transportation plan was developed including a transit element. A second series of open houses were held to review the draft transportation plan and identify constraints to the plan.

Public Involvement

First Round

The first round of public involvement included a series of two Public Open Houses, held in conjunction with a Technical Advisory Committee meeting. Open Houses were scheduled for Duncan on September 19, 2006, and Clifton on September 20. Prior to that date, flyers were mailed to a list of County stakeholders that was provided by the County. Eight persons attended the Duncan Open House—in addition to two members of the consultant team—and four persons attended the Clifton Open House. Participants in the first round of public involvement are listed in Table 1.

TABLE 1. PARTICIPANTS IN THE FIRST ROUND OF PUBLIC INVOLVEMENT

Participant	Affiliation	Duncan Open House	Clifton Open House
Alan Baker	Town Manager, Town of Duncan	●	
Jon Goeking	Town of Duncan	●	
Randy Norton	Mayor, Town of Duncan	●	
Rudy Perez	ADOT Transportation Planning Department (ADOT TPD)	●	
Philip Ronnerud	Greenlee County Public Works Director	●	●
Ysidro Solima	ADOT TPD	●	
Joe Schwer	ADOT Construction	●	
Eugene Weeks	Southeast Arizona Association of Governments (SEAGO)	●	
Paul R. David	ADOT Safford District		●
Larry Leach	Greenlee County Health Department		●
Walt Mares	<i>The Copper Era</i>		●
Pete Lima	Lima & Associates (Consultant Team)	●	●
Rob Bohannan	Lima & Associates (Consultant Team)	●	●

At each Open House, a presentation was given that summarized the findings of the project to date. After the presentation, attendees commented on the project and participated in a round-table discussion regarding the transportation-related issues in Southern Greenlee County and the local jurisdictions within the County.

The top three issues identified at the Duncan Open House were:

- Condition of major area roadways and the effect on economic development efforts
- Need for improved access to recreation, improved trails, and tourism
- Transit service, carpooling, and vanpooling

The top three issues identified at the Clifton Open House were:

- Funding for Transportation Projects and Area Population Growth
- Need for emergency access in case of flooding and wildfires
- Mobility, Transit and Tourism

Second Round

The second round of public involvement was scheduled as a series of two Public Open Houses, held in conjunction with a TAC meeting as the first round had been. Open Houses were scheduled for Duncan on September 19, 2007, and Clifton on September 20. Prior to that date, flyers were mailed to a list of County stakeholders that was provided by the County. Eight persons attended the Duncan Open House on September 19th—in addition to two members of the consultant team. On September 20, at 1:30 pm, a Technical Advisory Committee meeting was held at the Greenlee County Courthouse in Clifton. At 5:00 pm, a Public Open House had been scheduled; however, all but one of the stakeholders who participated attended the TAC meeting in the afternoon. Hence, the bulk of the discussion and stakeholder feedback took place at the TAC meeting, and the individual who arrived later was briefed on the proceedings and interviewed for additional input. Participants in the second round of public involvement are listed in Table 2.

TABLE 2. PARTICIPANTS IN THE SECOND ROUND OF PUBLIC INVOLVEMENT

Participant	Affiliation	Duncan Open House	Clifton Events
Alan Baker	Town Manager, Town of Duncan	●	
Paul R. David	ADOT Safford District	●	●
Tom Engel	ADOT Safford District	●	
Charlene FitzGerald	ADOT TPD	●	●
Robert Obregon	ADOT TPD	●	●
Richard Lunt	Greenlee County Supervisor	●	
Sharon R. Mitchell	Southeast Arizona Association of Governments (SEAGO)	●	●
Mike Allen	Public Works, Town of Clifton		●
Espie Castaneda	Town of Clifton		●
Mark Hoffman	ADOT Public Transportation Division		●
Philip Ronnerud	Greenlee County Public Works Director	●	●
Pete Lima*	Lima & Associates (Consultant Team)	●	●
Rob Bohannan*	Lima & Associates (Consultant Team)	●	●

Discussions of TAC members and stakeholders in both Duncan and Clifton focused on several key areas: Funding for transportation projects, Trail issues, Dial-a-Ride issues, and other modifications or additions to the draft Transportation Plan.

SUMMARY OF FINDINGS

Previous Studies, Plans, and Programs

- The 2003 Greenlee County Comprehensive Plan identified a series of transportation goals and objectives to improve transportation in Greenlee County.
- The Greenlee County Wildfire Protection Plan (GCWPP) identified lands at-risk from severe wildfire threat and strategies for reducing fuels on wild lands.
- The Greenlee County Multi-Hazard Mitigation Plan (GCMHMP) was prepared to assess the County's vulnerability to natural and human caused hazards, and to develop mitigation strategies that reduce the risks associated with those hazards.
- Approximately \$421,200 is programmed for 2006-2013 for the County oil program, a maintenance program using chip seal.
- A total of \$2 million has been programmed for the County Airport from Fiscal Year 2006 to 2010.
- The Town of Duncan has identified approximately \$5.6 million in proposed road improvements.
- Approximately \$38 million are programmed for improvements to state highways in the study area.

Current Socioeconomic Conditions

- Eighty percent of the land in the study area is publicly owned.
- The 2000 population of the study area was approximately 8,500 residents. The Department of Economic Security (DES) estimated the 2005 County population slightly decreased to approximately 8,300 residents.
- The minority population in the study area is approximately 46 percent compared to 36 percent statewide.
- The percent of people age 65 and older in the study area is about 10 percent compared to 13 percent statewide.
- Within the study area, approximately 21 percent of the population is mobility-limited compared to 11.6 percent statewide.
- The percent of the study area population below poverty level is about 10 percent compared to 12.6 percent statewide.
- The percent of households without an automobile is about 1.8 percent compared to 2.7 percent statewide.

Current Roadway Conditions

- Approximately 96 miles of roads in the town and unincorporated areas have been identified as regionally significant roads within the study area.

- Approximately 41 miles of the regionally significant roads are paved while 55 miles are unpaved.
- Thirty-six bridges and culverts are on county roads within the Study Area. Six of the 36 bridges have been identified to be replaced.
- An analysis of road deficiencies for statewide road needs indicates that \$5.8 million are required to improve county roads including right-of-way acquisition, minor widening, and reconstructing portions of county roads.
- Roads in the study area lack continuity and connectivity without a full road network. Currently, these roads are a system of finger or tributary roads tied to the State Highway System.
- Travel in Southern Greenlee County is reliant on the State Highway System because a local parallel road system does not exist.
- Emergency access is a critical issue in this large, spread out region, both in terms of limited alternative routes and inclement weather.
- With the exception of the segment of US 191 beginning at Three Way and extending through Clifton, no roadway capacity issues exist in the study area. However, the Study Area is dependent on the function of the US and State Highways as alternate routes are non-existent in most areas.
- From May 2001 through April 2006, 300 traffic crashes occurred in Southern Greenlee County. Three-fourths of these, or 225 crashes, took place on US or State Highways, including the five fatalities recorded.
- A number of federal and state sources of funding for transportation improvements exist. However, the distribution of these funds is based on area population, and the amounts received by the County and local jurisdictions in the Study Area are insufficient to meet the transportation needs.

Multimodal Conditions

- A trail system within the study area does not exist. Abandoned rail lines provide opportunities for trails. The County is interested in establishing a Countywide system of multi-use trails, perhaps using utility corridors and abandoned railroad rights-of-way. Maintenance issues and costs are a major consideration and must be addressed.
- The scenic beauty and comparatively mild climate of Southern Greenlee County are very conducive to outdoor activities including bicycling, hiking, and horseback riding and a number of recreation areas and activity centers are identified in the study area, including locations on private lands and State Trust lands. Multiuse Pathways are needed in urban and suburban areas.
- Candidate improvements to existing roadways are recommended, in addition to future consideration of additional alignments. Suggested improvements include roadway construction or reconstruction, minor roadway widening, and bridge replacement or rehabilitation.
- A number of opportunities exist within the study area for adding trails for pedestrian, equestrian, or bicycle use.

- Resources for use in the planning, design, and construction of trails and multiuse paths are available from the American Association of State Highway and Transportation Officials and other sources.

Transit Element

- No scheduled intercity public transportation exists in the Study Area. The “Arizona Rides” concept for the efficient use of special transportation needs should be implemented in the area.
- A replacement for the intercity bus service discontinued by Greyhound may be needed.
- Two vans are operated by the Southeast Arizona Community Action Program service for seniors and mobility-limited persons. Seniors are given priority, but remaining seats are made available to the general public on a first come, first served basis. The County would like to see more service for the general public.
- The two vans currently being operated in the Study Area may be meeting a significant percentage of estimated transit demand. In addition, Freeport-McMoRan currently operates free commute buses from Safford to the Morenci Mine for use by mine employees.
- The County and local jurisdictions should consider the implementation of additional ridesharing programs to complement the Freeport-McMoRan service and meet the needs of persons needing rides to Safford and other destinations for shopping, medical, and other reasons.
- Funding for expanding service to seniors and mobility-limited persons in the afternoons and on weekends may be needed.
- Some sort of surface transportation is needed at the airport for arriving general aviation pilots and passengers who have not made arrangements to be met.
- Activation of the O’Connor Airport facility in Duncan would need to be accompanied by improvements to the roadways serving the airfield.
- Potential may exist to develop an excursion passenger train operation on the rail line between Clifton and Duncan.

RECOMMENDATIONS

- The draft Capital Improvement Program includes over 70 miles of right-of-way acquisition, preservation, and surveying; 58 miles of minor roadway widening; and 38 miles of roadway construction and reconstruction.
- Of the total of \$49.6 million in projects, \$27.5 million is estimated for the Clifton area, \$4.7 million for the Duncan area, and \$17.4 million for the remainder of the Study Area.
- Despite the funding shortfall, the County should establish an implementation Task Force to oversee initial steps toward implementation. The Task Force would work

with ADOT and SEAGO to ensure that projects that mitigate critical safety concerns—such as locations where multiple crashes or fatal crashes have occurred—are included in the agencies’ current Transportation Improvement Programs.

- The County should adopt road standards as a guide for use when widening and reconstructing roadways. Uniform roadway standards should be developed by the County and the Towns of Clifton and Duncan.
- The County should adopt access management techniques, some of which are comparatively inexpensive to implement and will enhance mobility and safety.
- Policies recommended in this paper should be adopted in anticipation of possible acceleration of the rate of population growth triggered by activity in neighboring Graham County and the growing appeal of the area’s scenery and location by retirees.

2. REVIEW OF PREVIOUS STUDIES AND PLANS AND CURRENT PROGRAMS

PREVIOUS STUDIES AND PLANS

This chapter presents a review of previous studies and plans and current programs related to transportation in the study area. A summary of the review is presented in Table 3.

TABLE 3. SUMMARY OF PREVIOUS STUDIES, PLANS, AND PROGRAMS

Title	Year	Summary
Plans and Studies		
County Comprehensive Plan	2003	Presents a long-range plan for addressing land use, economic environmental, physical, and transportation needs with the County. Presents transportation related goals.
Duncan Comprehensive Plan	2004	Discusses future land use and presents goals, objectives, and policies for land use, transportation, public utilities and services, and economic development.
Greenlee County Airport Master Plan (2000 -2020)	2002	Identifies a 20-year improvement program for the County's Airport.
Greenlee County Multi-Hazard Mitigation Plan	2006	Prepared to assess the County's vulnerability to natural and human caused hazards and to develop mitigation strategies.
Greenlee County Wildfire Protection Plan	2005	Identified lands at risk from severe wildfire threat and strategies for reducing fuels and improving forest and rangeland health.
Globe-New Mexico Corridor Profile	2002	Established priorities for improvement strategies and projects on state highways within the corridor, including US 70, US 191, and SR 75 within the Southern Greenlee County study area.
Arizona State Parks Department, Arizona Trails 2005.	2004	Presents a Statewide motorized and nonmotorized trails plan.
Programs		
Greenlee County Roads Oil Project Seven-Year Program	2006	Presents a program for oil projects on county roads by Fiscal Year, from FY 2006 to FY 2012.
SEAGO-Administered Applications	2007	Transportation Enhancement Projects for sidewalks and bridge rehabilitation
County Airport Program Request	2006	Presents the Greenlee County request for capital improvements for the County airport for FY 2006 to 2010.
Town of Duncan Road Program	Undated	Presents complete, current, and proposed road improvements for the Town of Duncan.
ADOT Five-Year Transportation Facilities Construction Program (FY 2007 - 2011)	2006	Presents the five-year program for capital projects from FY 2007 through 2011.

County Comprehensive Plan

The *County Comprehensive Plan*, adopted in March 2003, presents a plan for addressing land use, economic environmental, physical, and transportation needs within the County. The plan included the following topics:

- History
- Regional Setting
- Population
- Goals
- Implementation Strategy
- Plan Elements
 - Commercial/Infrastructure
 - Economic
 - Environmental
 - Land Use
 - Recreation/Health
 - Residential/Natural Hazards
 - Statistics/Demographic

Transportation Related Goals

The following are transportation related goals that were defined in the plan:

- Develop a Master County Road Plan.
- Bring state highways up to current standards.
- Develop the County highway system to fullest potential.
- Encourage private property road owners to provide emergency access to the property.
- Promote alternatives to strip commercial development along major transportation routes.
- Adopt and enforce codes and standards for structure.
- Conserve and improve wildlife habitat to avoid specie depletion and encourage diversity of species.
- Preserve and improve riparian communities.
- Develop baseline of ecological processes and functions.
- Develop hiking and equestrian trail system for recreation and tourism.
- Clean up main corridors coming into and through the County to improve County's image.
- Preserve and enhance such facilities as mountain roads, bridges, scenic overlooks and landscape views for public enjoyment.

Transportation Recommendations

The comprehensive plan developed a set of recommendations in regard to the county's transportation system for state highways, county roads, other access ways, railroads, transit, bicycle and pedestrians, and airports. These recommendations are discussed in more detail in the Transportation Issues section of Chapter 3.

Duncan Comprehensive Plan

The draft Town of Duncan Comprehensive Plan 2004 presents an inventory of land use socioeconomic, economic, physical, and public facility conditions and a plan to address future needs. The plan discusses future land use and presents goals, objectives, and policies for land use, transportation, public utilities and services, and economic development.

Transportation Goals, Objectives, and Policies

The draft plan includes the following transportation goals, objectives, and policies

Goal	To develop and maintain an adequate transportation system for residential and commercial access, as well as transit access for the special needs population of the community.
Objective 1	Rehabilitate and maintain all public streets and roads to appropriate Town standards.
Policy 1	The Town should identify and inventory all public and private streets within the municipal limits.
Policy 2	The Town should adopt standards for the development and maintenance of its streets and roads.
Policy 3	The Town should develop a street program which will adequately maintain all public streets.
Policy 4	The Town should assume maintenance responsibility for additional roads when those roads are constructed to the Town's standards.
Objective 2	Provide adequate and reliable public transit for the elderly and handicapped population of the Town.
Policy 1	The Town should continue to support a special needs public transit system for the community.

Greenlee County Airport Master Plan (2000-2020)

The Airport Master Plan Update was conducted by the County with funding assistance from the Federal Aviation Administration and ADOT Aeronautics Division in order to document existing facility conditions and identify the future role of the airport. The following goals were adopted at the outset of the study:

- Goal:** To provide airport facilities and services in a fiscally responsible manner that maximizes safety, efficiency, and opportunity for use.
- Goal:** To develop aviation demand forecasts that are responsive to expected socioeconomic factors and demand levels in the Greenlee County area.
- Goal:** To produce a plan for airport development that meets the needs and desires of the Greenlee County area.

Key issues identified by the Planning Advisory Committee include:

- Potential need for a crosswind runway
- Need for Automated Weather Observation Systems (AWOS)
- Need for ground transportation services
- Potential need for a fixed base operator (FBO)
- Potential need for self-service fueling facilities
- Need to improve airport maintenance
- Need to correct drainage problem at east end of the runway
- Need defined landing zones for helicopters

The airport is classified by ADOT as a General Utility II airport serving “all small airplanes plus some small business and air taxi type twin engine airplanes.” The Federal Aviation Administration (FAA) has assigned the airport an Airport Reference Code (ARC) of B-II, meaning that the facility is designed for aircraft having a landing approach speed of 91 knots or more, but less than 121 knots, and wingspans of 49 feet up to, but not including, 79 feet. Table 4 presents a history of airport operations.

TABLE 4. HISTORY OF AIRPORT OPERATIONS

Year (Source)	Total Aircraft Operations
1992 (1993 Master Plan)	4,320
1995 (1995 State Aviation Needs Study)	3,784
1998 (1998 Terminal Area Forecast)	6,000
2000 (FAA 5010, Air Nav 2000)	6,604
2000 (Airport Staff)	6,726

Source: Greenlee County Airport Master Plan (2000-2020)

The 2000 estimate of 6,726 operations was used as a baseline operations figure in the Master Plan. A breakdown by type of operation is presented in Chapter 5.

Forecasted Future Operations

The consultant developed a forecast of future operations based on historical data for the facility, input from the PAC, airport users, airport staff, national trends for the general aviation industry, pertinent socioeconomic activity data and trend information, existing federal state, and local forecasts, and forecasting models. The net result of evaluating these different approaches was the prediction of a one percent growth in operations, as presented in Table 5.

TABLE 5. FORECASTED AIRPORT OPERATIONS

Year	Annual Growth Rate (%)	Total Aircraft Operations
2000	-	6,726
2005	1.0	7,070
2010	1.0	7,430
2020	1.0	8,210

Source: Greenlee County Airport Master Plan (2000-2020)

Contingency Demand

A proposal exists to develop a Federal Prison operation at the airport, as discussed among the County and Federal Prison staff members. This operation would consist of the arrival and departure of aircraft carrying prisoners. The proposal includes the following assumptions:

- Prisoners will arrive and depart on Boeing 727-200 or comparable aircraft
- Aircraft will not be based at the airport
- Aircraft will operate as a charter and not as a scheduled service
- Aircraft will arrive twice weekly, resulting in more than 32 additional operations per month
- Aircraft will primarily be transporting prisoners—the number of prisoners will average 40 to 60 per flight
- Aircraft may carry cargo in addition to the prisoners

The facility would have to be certified by the FAA to handle this type of traffic. In addition, significant improvements to the airport would need to be made, including lengthening the runway to over 8,000 feet to accommodate the 727 aircraft.

Airport Master Plan for O'Connor Field Airport, Duncan, Arizona

This Airport Master Plan was conducted by the Town of Duncan in 1998 with funding assistance from the Federal Aviation Administration and the ADOT Aeronautics Division. The Master Plan provides a concept for developing and modernizing the airfield.

O'Connor Field is located in Duncan, approximately 1.5 miles southwest of the Town Hall at an elevation of 3,867 feet above sea level. The field has not been in operation since 1987 and no facilities exist except for two dirt runways, the longest of which is 2,750 feet in length.

The goal of the Town is to create a safe and efficient facility for area aviation users. Anticipated users include medivac, business, agricultural, recreational, and training flights.

The objectives of the study were defined as follows:

- Inventory existing air operations and facilities
- Develop a forecast of aviation demand based on socioeconomic and population information and available historical air traffic data
- Determine the types of aircraft that will use the facility and identify the appropriate improvements and facilities indicated.
- Propose a development schedule, including cost estimates
- Prepare a new Airport Layout Plan Drawing Set

New improvements and facilities included in the Master Plan include extending and paving the runways to a minimum length of 5,600 feet, and the provision of taxiways, apron space and tie-downs, hangars, airfield lighting, and visual aids. The Plan includes an analysis of the actions necessary to implement the proposed improvements and projects.

The study recommended that the Town of Duncan designate an Airport Advisory Committee to establish policy and procedures for the operations and management of the airport as well as the establishment of rates and charges for leases and services. All proposed construction projects in the vicinity of the airport should be reviewed to ensure that none violates Federal Aviation Administration (FAA) rules concerning airspace obstructions. The study recommended that the Town acquire and zone abutting property as needed to ensure future Runway Protection Zones, Safety Areas, and Object Free Areas, as well as ensure compatible land uses near the airport.

The study recommended that O'Connor Field continue to be included as a secondary airport in the Arizona State Aviation System Plan, and that the Town submit a Notice of Landing Area Proposal to the FAA to reactivate the airport.

Greenlee County Multi-Hazard Mitigation Plan (GCMHMP)

The *Greenlee County Multi-Hazard Mitigation Plan* was prepared to assess the County's vulnerability to natural and human caused hazards, and to develop mitigation strategies that reduce the risks associated with those hazards. The primary purpose of this plan is to:

- Identify natural and human-caused hazards that impact Greenlee County
- Assess the vulnerability and risk posed by those hazards to community-wide human and structural assets
- Develop strategies for mitigation of those identified hazards and present future maintenance procedures for the plan
- Document the planning process

Four significant hazards were identified in the study area: These are: Flooding; Wildfire; Dam Levee Failure; and Hazardous Materials Incidents. Table 6 presents a summary of potential economic loss and human exposure for these hazards for the entire County.

TABLE 6. SUMMARY OF POTENTIAL IMPACTS OF HAZARDS

Hazard	Potential Economic Loss^a	Potential Human Exposure^b
Flooding	\$5.9 million	982
Wildfire	\$360.4 million	124
Dam/Levee Failure	\$15.3 million	115
HAZMAT Incident	\$631,000	4,197

^a These numbers represent estimates of the losses that may be realized assuming the hazard occurs to all facilities within the hazard impact area

^b These numbers represent the total human population potentially exposed to the hazard and are based on 2000 Census data as distributed with the HAZUS program by FEMA.

Source: Greenlee County Multi-Hazard Mitigation Plan (GCMHMP)

Flooding

Two perennial rivers, the Gila River and San Francisco River, traverse Southern Greenlee County. Areas between Clifton and Duncan are rated as medium to high potential flood hazards. Both Duncan and Clifton have been hit with heavy flooding in the past. Floods in southern Greenlee County in 1978, 1983, 1993, and 2005 severely impacted homes, businesses, farm land, roadways, and utilities.

Wildfire

Since the mid-1990s the majority of wildfire starts have occurred in the northern portion of the County, resulting in 71,500 acres burned. Large scale fires have not been frequent in the lower elevations and desert vegetation zones. The vegetation in Southern Greenlee County is rated as low flammable vegetation. A separate *Community Wildfire Protection Plan (CWPP)* has been prepared by the County and is reviewed separately.

Dam/Levee Failure

Five regulatory or recognized dams and/or levees are located within the Study Area, all of which are associated with the Freeport-McMoRan Morenci mine. Of the five, two are classified as “High Hazard,” which means that loss of human life due to a failure is probable, with one or more fatalities expected. One of the High Hazard dams (Columbine Dam) has been decommissioned by Freeport-McMoRan and will be completely removed within the next couple of years. The other High Hazard dam (Lower Chase Creek) is also owned and maintained by Freeport-McMoRan and is located just upstream of Clifton.

Hazardous Materials Incidents

The GCMHMP analyzed incidents for Extremely Hazardous Substances (EHS) that include chlorine gas, sulphuric acid, and hydrogen fluoride. There were at least six reported incidents of EHS HAZMAT releases that have occurred since 1990 within Greenlee County that involved at least one injury/fatality or some amount of property damage. Four of the spills were traffic accident related and located within the Morenci area. Five of the incidents involved sulphuric acid and one chlorine gas. Two hazard classifications, high and medium, were developed for profiling EHS hazards. High hazard exposure areas are assumed to be located within a one-mile radius or offset of any Tier II EHS facility or roadway/railway transportation corridor where EHS materials are known to be stored or transported on a somewhat regular basis. Similarly, the medium hazard exposure areas are assumed to be located within a second one-mile wide band that is offset from the high hazard area. State highway corridors within Southern Greenlee County have been rated as high potential EHS HAZMAT Hazard within a one mile radius and as moderate potential from one mile to two miles.

Mitigation Actions/Projects

A summary of transportation related mitigation actions/projects is presented in Table 7 below.

TABLE 7. SUMMARY OF GREENLEE COUNTY MITIGATION ACTIONS/PROJECTS - SOUTHERN GREENLEE COUNTY STUDY AREA

Action/Project		Estimated Losses Due to Hazard	Percent of Hazard Mitigated	B/C Ratio	
Name	Description				Cost
Burma Road Bridge	Design and construct a bridge at the Burma Road crossing of Gila River.	\$9,000,000	\$5,900,000	N/A	1.00
Juan Miller Crossing	Design and construct hardened crossing at the Juan Miller Crossing of the Lower Blue River.	\$320,000	\$5,900,000	N/A	1.00
Emergency Response Plan Update	Review and update the Emergency Response Plan on at least an annual basis.	\$10,000	\$631,000	N/A	1.00
Duncan Rural Fire District Substation	Build and equip a new fire substation in the area north of Duncan to service areas north of Gila River.	\$500,000	N/A	N/A	1.00
Lower Chase Creek Watercourse Master Plan	Develop and implement a floodplain management and land-use plan for Lower Chase Creek, from the PD Dam to the San Francisco River confluence. The management plan will consider socio-economic factors as well as standard floodplain and erosion hazard management elements.	\$2,000,000	\$5,900,000	N/A	1.00

Source: Greenlee County Multi-Hazard Mitigation Plan (GCMHMP)

Greenlee County Wildfire Protection Plan (GCWPP)

The *Greenlee County Wildfire Protection Plan* identified lands at-risk from severe wildfire threat and strategies for reducing fuels on wildlands while improving forest and rangeland health, supporting local industry and local economies, and improving public and firefighter safety and response capabilities.

The ten primary goals of the GCWPP were:

- Improve fire prevention and suppression
- Reduce hazardous forest fuels
- Restore forest health
- Promote community involvement and education
- Recommend measures to reduce structural ignitability in the GCWPP area
- Encourage economic development and stability in the community through protection of the ecosystem and utilization of forest products
- Identify watersheds at-risk and potential impacts to downstream communities
- Identify funding needs and opportunities
- Expedite project planning
- Prioritize high risk projects

The plan included an analysis of the Wildland-Urban Interface (WUI) to delineate the “area in or adjacent to an at-risk community.” The WUI is commonly described as the zone where structures and other features of human development meet and intermingle with undeveloped wildland or vegetative fuels. Communities in the WUI face substantial risk to life, property, and infrastructure. Wildland fire in the WUI is one of the most dangerous and complicated situations firefighters face. Within the analysis area, a single WUI boundary was delineated that surrounds the communities of Blue, Eagle Creek, Morenci, Duncan, and Clifton; significant community infrastructures; and roadways used as evacuation/fire fighting resource distribution routes. The study identified high-risk areas, including the economic corridors that line US 191, SR 75, and SR 78 that have been and continue to be the focus of community development.

Evacuation/resource response routes and significant infrastructures were also identified to provide for firefighter safety and to ensure the protection of life and property. Greenlee County has recently developed “Evacuation Plans” to be included in the current County Evacuation Plan for the Blue and Eagle Creek intermix communities.

Evacuation/resource response routes and significant infrastructures were also identified to provide for firefighter safety and to ensure the protection of life and property. Three of areas from which needed escape routes were identified are adjacent to or intersect US 191:

- Federal land north of Beaverhead adjacent to US 191 evacuation route in area of high fuel hazard

- Area including private and federal land south of Hannagan Meadow Lode adjacent to US 191 evacuation route
- Area including private and federal land southeast of the community of Eagle Creek along FR 217 and intersecting US 191

Globe-New Mexico Corridor Profile, BRW November 2002

The *Globe-New Mexico Corridor Profile* established priorities for improvement strategies and projects on state highways within the corridor. The corridor included the following state highways: US 70 from Globe to the New Mexico line, SR 191 from I-10 to US 70, SR 366, SR 191 from US 70 to SR 75, SR 266, and SR 191 from SR 78 to Morenci.

The following issues were identified within the Southern Greenlee County study area:

- Cut ditches and slopes on US 70 east of Safford do not meet current standards.
- US 70 roadway not constructed to current standards and loadings.
- Backups occur in Duncan when traffic is detoured to US 70 from I-10.
- Flooding issues were identified for US 70 in Duncan, SR 75 Gila River Bridge, and the US 191 bridge over the San Francisco River in Clifton.
- The Morenci tunnel on US 191 has a substandard design and low vertical clearance.
- UPRR Clifton Branch has poor shoulders and occasional congestion in Clifton Yard.
- The Three-Way intersection with SR 75 has poor sight distance due to vertical geometrics.
- The US 70/Duncan rail crossing needs to be improved.
- US 191/SR 75 intersection – raise Cold Creek Bridge and lower intersection, widen shoulders.
- Greenlee County Airport is without transit or taxi service.
- Intercity bus or rail service in the study area does not exist.

Table 8 summarizes the vision developed by the study for state highways in the southern Greenlee County study area:

**TABLE 8. CORRIDOR VISION
SOUTHERN GREENLEE COUNTY STUDY AREA**

Route	Vision
US 70 from US 191 to New Mexico line	Two-lane rural highway with widened shoulders. Within Duncan, widen to 3 lanes. Install signal at SR 75 junction when warranted.
US 191 from MP 139.0 to SR 75	Two-lane rural highway with continuous climbing lane.
US 191 between SR 75 and Clifton	Four-lane section with minor improvements.
US 191 in Clifton/Morenci area	Three-lane section.
US 191 – Morenci Tunnel	Rehabilitate tunnel.

Source: *Globe-New Mexico Corridor Profile*, BRW November 2002

The corridor study did not address local/state highway interface access management issues. However these issues are discussed in a subsequent chapter of this Report.

Arizona Trails 2005

The *Arizona Trails 2005* Plan was completed by the Arizona State Parks Department (ASPD) in November 2004, and provides information and recommendations for the ASPD and other agencies regarding the management of motorized and nonmotorized trail resources. The Plan is specifically designed to guide the distribution and expenditure of the Arizona Off-Highway Vehicle (OHV) Recreation Fund, the trails component of the Arizona Heritage Fund, and the Federal Recreational Trails Program. The priority recommendations developed from the Plan's public involvement process are summarized in Table 9.

TABLE 9. PRIORITY RECOMMENDATIONS OF ARIZONA TRAILS 2005 PLAN

Motorized Trail Use	Nonmotorized Trail Use
First Level Priority Recommendations	
<ul style="list-style-type: none"> • Develop New Trails And Motorized Recreation Opportunities • Protect Access To Trails/Keep Trails Open • Renovation And Maintenance Of Existing Trails • Education And Trail Etiquette 	<ul style="list-style-type: none"> • Renovation and Maintenance of Existing Trails • Protect Access to Trails/Acquire Land for Public Access • Develop Signage and Support Facilities
Second Level Priority Recommendations	
<ul style="list-style-type: none"> • Enforcement of existing rules and regulations/monitoring • Trail information and maps • Comprehensive planning 	<ul style="list-style-type: none"> • Comprehensive Planning • Trail Information/Maps • Education and Trail Etiquette
Other Priority Recommendations	
<ul style="list-style-type: none"> • Reduce Cultural And Environmental Resource Impacts • Seek Additional Funding Sources • Interagency Coordination • Develop Signage And Support Facilities 	<ul style="list-style-type: none"> • Reduce Cultural And Environmental Resource Impacts • Seek Additional Funding Sources • Interagency Coordination • Develop New Trails • Coordinated Volunteerism • More Accessible Trails for Individuals with Physical Disabilities • Enforcement of Existing Rules and Regulations/Monitoring

Source: *Arizona Trails 2005* Plan, Arizona State Parks Department, November 2004

COUNTY TRANSPORTATION NEEDS, PROGRAMS, AND FUNDING

This section discusses County road needs identified by the Arizona Association of County Engineers and presents current programmed improvements for Greenlee County, Duncan, and State highways.

County Road Needs and Funding

The Arizona Association of County Engineers (AACE) prepared the Year 2004 *Roadway Needs Study Update* in cooperation with Arizona Counties for unincorporated areas. Improvement costs were determined by comparing the existing conditions of County roads within the unincorporated areas with a uniform state standard established by the AACE. Order of magnitude unit costs for historic ADOT costs were applied to resulting deficiencies. The resulting costs may vary significantly from actual project costs.

According to the study update, the estimated cost of transportation needs in Greenlee County for the years 2005-2014 was \$29.6 million. The breakdown of these needs includes an estimated \$16.5 million for maintenance, \$3.9 for bridges, \$4.7 for upgrading existing roads, and about \$3.7 for safety and operations. A table summarizing roadway deficiencies is presented later in this Report. Additional funding information is provided in Chapter 7.

County Maintenance Program

Table 10 presents the Greenlee County Roads Oil Project Seven-Year Program. Approximately \$421,200 is programmed over a seven-year period for maintaining County roads.

TABLE 10. GREENLEE COUNTY ROADS OIL PROJECT SEVEN-YEAR PLAN

	Start	Stop
FY 2006		
Stevens Loop Rd		Intersection Stevens Loop Rd at Highway 75
Country Club Rd	Intersection Country Club Rd at Highway 75	Country Club Rd end of pavement
Ward Canyon Rd	Soap Box Cattle Guard	Intersection Skyline Rd at Ward Canyon Rd
Skyline Rd	Skyline Rd at Calle Del Rio	Intersection Skyline Rd at Highway 191
Total \$1,10307.50		
FY 2007		
Virden Rd	Intersection Highway 75 at Virden Rd	Virden Rd at New Mexico State Line
Burma Rd	Intersection Highway 70 at Burma Rd	Burma Rod end of pavement
Old Virden Rd	Intersection Highway 75 at Old Virden Rd	Intersection Virden Rd at Old Virden Rd
Airport Rd	Intersection Highway 78 at Airport Rd	End of Rd
Corral Rd	Intersection Highway 75 at fence entering Park	
Total \$77,867.04		
FY 2008		
Franklin Rd	Intersection Highway 70 at Franklin Rd	Franklin Rd at New Mexico State Line
Foster Lane	Intersection Highway 70 at Foster Lane	Foster Lane end of pavement
Plantsite Rec. Rd	Intersection Reservation Rd at Plantsite Rec. Rd	Plantsite Rec. Rd end of pavement
Morenci Park		
Parking Lot	Parking Lot	Parking Lot
Sheldon Loop Rd	Intersection Highway 75 at Sheldon Loop Rd	Intersection Sheldon Loop Rd at Highway 75
Total \$95,682.00		
FY 2009		
Apache Grove Rd	Intersection Highway 75 at Apache Grove Rd	Apache Grove Rd end of pavement
Fairway Drive Rd	Intersection Highway 75 at Fairway Drive	Fairway Drive end of pavement
Tee Street	Intersection Fairway Drive at Tee Street	Tee Street end of pavement
Caddy Lane	Intersection Fairway Drive at Caddy Lane	Caddy Lane end of pavement
Calloway Rd	Intersection Fairway Drive at Calloway Rd	Calloway Lane end of pavement
Ping Drive - Green Lane	Ping Drive end of pavement	Driver end of pavement
Birdie Street - Driver Avenue	Intersection Fairway Drive at Birdie	Driver Avenue End of pavement
Cart Street	Intersection Fairway Drive at Cart Street	
Cosper Rd	Intersection Highway 75 at Cosper Loop Rd	Intersection Cosper Loop Rd at Highway 75
Total Cost \$57,658.00		

**TABLE 10. GREENLEE COUNTY ROADS OIL PROJECT SEVEN-YEAR PLAN
(CONTINUED)**

FY 2010		
Calle Alta Vista	End of Skyline Rd	Stop: Rattlesnake Int.
N. Calle Del Sol	Start: Int. Calle Alta Vista	Stop: Int. Calle Del Sol at Rattlesnake Rd
S. Calle Del Sol	Curve at Calle Del Rio	Calle Alta Vista Intersection
Calle Del Rio	End of Calle Del Sol	End of Rd
S. Calle Luna		
Calle Contento		
Calle Placita		
Calle Chico		
Calle Conquista		
N. Calle Luna		
Tot Lot Walkway		
Ward Canyon Rd	Soapbox at cattle guard	At Cemetery
Total \$60,588.00		
FY 2011		
Bobcat Drive	Int. Wards Canyon at Bobcat Drive	Int. Bobcat Drive at Cougar Rd
Mountain Lion Drive	Int. Mountain Lion Drive at Whitetail Rd	Int. Mountain Lion Drive at Bobcat Drive
Wildlife Drive	Int. Wildlife Drive at Lynx Rd	Int. Wildlife Drive at Elk Rd
Whitetail Rd	Int. Whitetail Rd at Bobcat Drive	End of Whitetail Rd
Quail Run		
Lynx Rd		
Elk Rd		
Buckhorn Rd		
Falcon Rd		
Hackberry Drive	Int. Wards Canyon Rd at Hackberry Drive	End of Rd
Hemlock Street		
Birch Street		
Spruce Street		
Lake Drive		
Ward Canyon Rd	Cemetery	End Bluff at bottom of Rd
Total \$91,436.25		
FY 2012		
Fairgrounds Rd	Int. Highway 75 and Fairgrounds rd.	Int. Fairgrounds Rd and Highway 75
McCarty Trail	Int. Highway 75 and McCarty Trail	End of Rd
Cherokee Drive		
Muscalero		
Comanche		
Seminole		
Pawnee		
Shoshone		
Cheyenne Lane		
Carrol Loop		
Total \$45,936.90		

Source: Greenlee County Public Works

County Airport Program Request

Table 11 presents the Greenlee County request for capital improvements for the county airport for FY 2006-2010.

TABLE 11. FEDERAL AVIATION ADMINISTRATION/ARIZONA DEPARTMENT OF TRANSPORTATION FIVE-YEAR CAPITAL IMPROVEMENT PROGRAM, FY 2006-2010 PROJECT REQUEST FORM

Fiscal Year	Project Component	Project Description	Total	\$ Federal Participation	\$ State Participation	\$ Local Participation
Federal Funding (with or without ADOT match funding)			100%	95.00%	2.50%	2.50%
2006	Rehabilitate Apron - Reconstruction	Rehab Apron (11,000 sy)	\$200,000	\$190,000	\$5,000	\$5,000
		(Apron - 01GR)		\$0	\$0	\$0
FSL Fiscal Year Totals			\$200,000	\$190,000	\$5,000	\$5,000
State - Local funding only			100%		90%	10%
2006	Runway Construct	Design Drain./Erosion Control Imp.	\$50,000		\$45,000	\$5,000
		Design Apron Rehabilitation				
2006	Apron Reconstruct	(11,000 sy) (Apron - 01GR)	\$30,000		\$27,000	\$3,000
SL Fiscal Year Totals			\$80,000		\$72,000	\$8,000
TOTAL FOR THE FISCAL YEAR			\$280,000	\$190,000	\$77,000	\$13,000
Federal Funding (with or without ADOT match funding)			100%	95.00%	2.50%	2.50%
2007	Install miscellaneous <NAVAIDS/Approach Aids> - Standards	GPS Approach Equip.	\$50,000	\$47,500	\$1,250	\$1,250
2007	Improve Airport <Drainage/Erosion Control/miscellaneous improvements> - Standards	Drain./Erosion Control Imp	\$250,000	\$237,500	\$6,250	\$6,250
FSL Fiscal Year Totals			\$300,000	\$285,000	\$7,500	\$7,500
State - Local funding only			100%		90%	10%
2007	Obstruction Removal (Part 77)	Design Rel. of Power Poles & Structures to comply with Part 7	\$50,000		\$45,000	\$5,000
2007	Land (Protection) Acquisition	Acquire approx. 198 acres for RPZ Protection & Fac. Expan.	\$100,000		\$90,000	\$10,000
					\$0	\$0
SL Fiscal Year Totals			\$150,000		\$135,000	\$15,000
TOTAL FOR THE FISCAL YEAR			\$450,000	\$285,000	\$142,500	\$22,500
Federal Funding (with or without ADOT match funding)			100%	95.00%	2.50%	2.50%
2009	Construct Taxiway - Capacity	onstr. Parallel Taxiway Ph II (west - 2600	\$750,000	\$712,500	\$18,750	\$18,750
2009	Conduct <Environmental Assessment/Environmental Impact Statement/Feasibility> <study/update>	E.A for 291' Rwy/Twy Extension	\$100,000	\$95,000	\$2,500	\$2,500
FSL Fiscal Year Totals			\$850,000	\$807,500	\$21,250	\$21,250
State - Local funding only			100%		90%	10%
2009	Taxiway Construct	Design 291' Taxiway Extension	\$50,000		\$45,000	\$5,000
2009	Runway Construct	Design 291' Runway Extension			\$0	\$0
SL Fiscal Year Totals			\$50,000		\$45,000	\$5,000
TOTAL FOR THE FISCAL YEAR			\$900,000	\$807,500	\$66,250	\$26,250
Federal Funding (with or without ADOT match funding)			100%	95.00%	2.50%	2.50%
2010	Construct Taxiway - Capacity	Construct 291' Taxiway Extension	\$50,000	\$47,500	\$1,250	\$1,250
2010	Construct Runway - Capacity	Construct 291' Runway Extension	\$200,000	\$190,000	\$5,000	\$5,000
FSL Fiscal Year Totals			\$250,000	\$237,500	\$6,250	\$6,250
State - Local funding only			100%		90%	10%
2010	Signage Install	Airfield Signage	\$100,000		\$90,000	\$10,000
SL Fiscal Year Totals			\$100,000		\$90,000	\$10,000
TOTAL FOR THE FISCAL YEAR			\$350,000	\$237,500	\$96,250	\$16,250

Town of Duncan Road Program

The road improvement for the Town of Duncan is present in Table 12.

TABLE 12. TOWN OF DUNCAN ROAD IMPROVEMENTS

Duncan Proper			
Phase I	Length	Width	Total
Complete	775.00	30.00	104,150.31
Current	723.00	30.00	97,162.16
Proposed	8467.00	30.00	1,137,858.96
East Duncan			
Phase II	Length	Width	Total
Complete	2,340.00	30.00	314,466.75
Current	3,156.00	30.00	424,126.95
Proposed	5,759.00	30.00	773,937.61
Hunter Estates			
Phase III	Length	Width	Total
Complete	2,592.00	30.00	348,332.40
Current	2,790.00	30.00	374,941.13
Proposed	17,682.00	30.00	2,376,239.78
Babbitt/Duncan Heights			
Phase IV	Length	Width	Total
Complete		None	
Current		None	
Proposed	9,453.00	30.00	1,270,365.04

Source: Town of Duncan

STATEWIDE AND AREA PROGRAMMED IMPROVEMENTS

Arizona Department of Transportation

The Arizona Department of Transportation *Five-Year Transportation Facilities Construction Program* (FY 2007–FY 2011) includes over \$36 million in programmed major construction projects for Greenlee County as shown in Table 13. In addition to the major projects listed, a \$3 million pavement preservation project will be undertaken for SR 78. This project is scheduled for FY 2009 and begins at MP 154.6 (at Three Way) and continues to the USFS boundary at MP 165.50. Current plans are for a 2-inch overlay with an emulsion chip seal surface course. A guardrail run at a hairpin turn near the end of the project will be extended and reconstructed. Costs are estimated at \$2.5 – \$3.0 million. The Initial Project Assessment estimate from 2005 was \$1.75 million.

SouthEastern Arizona Governments Organization (SEAGO)

SEAGO is currently administering four Transportation Enhancement Project applications in Greenlee County for ADOT as shown in Table 14: Town Of Clifton Pedestrian Sidewalk; Greenlee County Concrete Arch Bridge Project; Greenlee County Rehabilitate Four Wood Bridges Project; and the Greenlee County York Valley Pedestrian Walkway Project.

**TABLE 13. 2007-2011 FIVE-YEAR TRANSPORTATION FACILITIES
CONSTRUCTION PROGRAM – GREENLEE COUNTY**

Route	BMP	Location	Length	Type of Work	Funding	Dollars in Thousands (\$000)				
						FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
70	378.4	Duncan-State Line	6.85	RR 3" + ARFC	STP	\$3,000	\$0	\$0	\$0	\$0
191	151	MP 151 – THREE WAY	3.20	Construct Rdwy & Bridge Approaches	BR	\$4,146	\$0	\$0	\$0	\$0
191	151	MP 151 – THREE WAY	3.20	Construct Rdwy & Bridge Approaches	NH	\$29,000	\$0	\$0	\$0	\$0
191	175	Coronado Trail	50.00	District Force Account	STATE	\$200	\$0	\$0	\$0	\$0
191	175	Coronado Trail	50.00	District Force Account	STATE	\$0	\$200	\$0	\$0	\$0
Total						\$36,346	\$200	\$0	\$0	\$0

Source: ADOT 2007-2011 Five-Year Transportation Facilities Construction Program

**TABLE 14. SEAGO-ADMINISTERED TRANSPORTATION ENHANCEMENT PROJECT
APPLICATIONS IN STUDY AREA**

Project Reference	Description	Federal Funds	Matching Funds	Total
Clifton TE App 2007s	1,898 feet of 5-foot sidewalk and pedestrian bridge along US 191 in Clifton	\$262,055	\$15,840	\$277,895
Greenlee Concrete	Rehabilitate two Old Safford Highway arch bridges – structure #'s 8150 and 8151	\$331,108	\$31,778	\$362,886
Greenlee TEA Wood Bridge	Rehabilitate four wood bridges: #8146 on Sheldon Loop, #8144 on Stevens Loop, #8145 on Stevens Loop, and #8142 on Fairgrounds Road	\$302,797	\$26,000	\$328,797
Greenlee York Bridge	Second Phase, York Valley Pedestrian Walkway: 150-foot pedestrian bridge over Cottonwood Creek upstream of and parallel to SR 75 at MP 395.7 in York Valley	\$514,638	\$52,519	\$567,157

3. SUMMARY OF EXISTING AND FUTURE CONDITIONS

Chapter 3 describes the current physical and socioeconomic conditions within the study area. This chapter also discusses the current transportation conditions within the study area, including roadways, structures, traffic conditions, crashes, and multimodal facilities. A discussion of issues that have been identified through a review of the 2003 Greenlee County Comprehensive Plan and other documents and conversations with stakeholders follows. Information on future population growth in Greenlee County and estimated future traffic volumes is presented.

SOCIOECONOMIC AND PHYSICAL CONDITIONS

Natural Environment

The Peloncillo Mountains extends in a northwesterly direction along the Greenlee County/Graham County boundary ranging in elevation of about 5,000 feet to 6,600 feet. The mountain range slopes easterly down to the Gila River with elevations ranging from 3,300 to 3,500 feet east of the river. The Freeport-McMoRan Morenci Copper Mine is located at the north end of the study area. The mine property covers approximately 60,000 acres and is the largest copper mine in North America and one of the largest open pit mines in the world. South of Morenci, the town of Clifton is at an elevation of about 3,500 feet with canyon walls stretching up around the town and the San Francisco River meandering through the town from northeast to southwest. Further south, along the Gila River southern Greenlee County has diverse agricultural production, including dairy and traditional cotton farming, vegetable production, alfalfa, corn, wheat, and other crops. Working cattle ranches operate throughout the county.

Vegetation and Hydrology

Vegetation within the study area ranges from desert scrub along the Gila River to Grassland north of Clifton and Morenci. The study area includes three perennial streams: the Gila River, San Francisco River, and Eagle Creek. A significant number of tributaries flow into these streams.

Species Status and Habitat

Table 15 presents the species status within Greenlee County. Three perennial streams; Gila River, Eagle Creek, and San Francisco River, in the study provide riparian habitats. The Federal, State, and private lands are also important wildlife areas.

TABLE 15. GREENLEE COUNTY SPECIES STATUS

Common Name	Status	Elevation	Habitat
Apache (Arizona) Trout	Threatened	> 500 0ft	Cold mountain streams with many low gradient meadow reaches
California Brown Pelican	Endangered	Varies	Found around many Arizona lakes and rivers.
Chiricahua Leopard Frog	Threatened	3,300-8,900 ft	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs.
Gila Chub	Endangered	2,000-5,500 ft	Pools, springs, cienegas, and streams.
Gila Trout	Endangered	5,000-10,000 ft	
Lesser Long-Nosed Bat	Endangered	< 6,000 ft	Desert scrub habitat with agave and columnar cacti present as food plants.
Loach Minnow	Threatened	< 8,000 ft	
Mexican Gray Wolf	Endangered	4,000-12,000 ft	
Mexican Spotted Owl	Threatened	4,100-9,000 ft	
Razorback Sucker	Endangered	< 6,000	
Southwestern Willow Flycatcher	Endangered	< 8,500 ft	
Spikedace	Threatened	< 6,000 ft	
Yellow-Billed Cuckoo	Candidate	< 6,500	
Gooddings Onion	Conservation Agreement	> 7,500 ft	

Source: Arizona Species Database, May 17, 2006

Wilderness Area:

The Peloncillo Mountain Wilderness Area extends across the southern Greenlee County/Cochise County line. The Bureau of Land Management (BLM) Web page describes the Peloncillo Mountain Wilderness as follows:

The wilderness lies within the rugged Peloncillo Range, which stretches from Mexico to the Gila River. This remote and primitive area flanking the New Mexico state line shows little signs of human activity. The Peloncillo Mountain Wilderness offers outstanding opportunities for primitive recreation, including hiking, backpacking, rock scrambling, hunting and sightseeing. The higher country offers long-distance views; and excellent scenery enhances wilderness values in the rugged mountains and canyons.

Desert bighorn sheep have been recently reintroduced to the region and share their home with peregrine falcons and four other sensitive animal species. Vegetation ranges from desert shrub grasslands in the surrounding flatlands to oak juniper woodlands in the higher reaches. The area is also rich in archaeological sites with the historic Butterfield Stage route forming the southern boundary of the wilderness.

For four years from 1857 to 1861, the Butterfield Stage line operated twice weekly between St. Louis and San Francisco on a 25-day schedule using Concord Stage Coaches or spring wagons pulled by four-horse teams. The route through Northern Cochise County roughly paralleled that of today's Interstate 10, passing through San Simon, Dragoon, and Benson.

Air Quality

In general, air quality in the County is very good. The following information on air quality in Greenlee County was stated in the 2003 Comprehensive Plan.

- Visibility is generally excellent within the County. The county experiences some haze, particularly when wild fires are burning.
- The Federal Government designated the Morenci area of Greenlee County as a non-attainment area for SO₂. Significant SO₂ emissions ceased in 1982 when the copper smelter in Morenci closed; effective June 25, 2004, the area was reclassified as a “maintenance area” by the EPA.
- Dust and PM₁₀ have been significantly reduced by armor coating (macadam paving) roads within populated areas.
- Some issues have been raised from wind blown material from the tailings dams and agricultural activities. Freeport-McMoRan is working on the rehabilitation of the tailings dump surface.

Water Quality

Water quality is generally good in the County. The 2003 Comprehensive Plan noted the following in regard to water quality.

- Some areas do have poor quality water with naturally occurring, high mineral content. We do not see contamination from basic industry or mining.
- Streams and rivers are “clean,” although after storms evidence of sediment transport is seen.
- The Arizona Department of Water Resources has established several areas to monitor water quality.

Floodplains

As noted in the review of the GCMHMP, there have been a number of significant floods in southern Greenlee County resulting in severe damage to property and infrastructure. Flooding of the San Francisco River has stopped traffic on U.S. 191 and the railroad through Clifton. Flooding of the Gila River in Duncan Valley has also stopped traffic on SR 75, as well as US 70 and the railroad.

Current Socioeconomic Environment

Land Ownership

The status of ownership of major land parcels in the study area is presented in Table 16 and illustrated in Figure 3. Twenty percent of the land area in the study area is privately owned compared to 6 percent countywide. Figure 4 is a map of the land ownership.

TABLE 16. STATUS OF LAND OWNERSHIP IN SOUTHERN GREENLEE COUNTY STUDY AREA

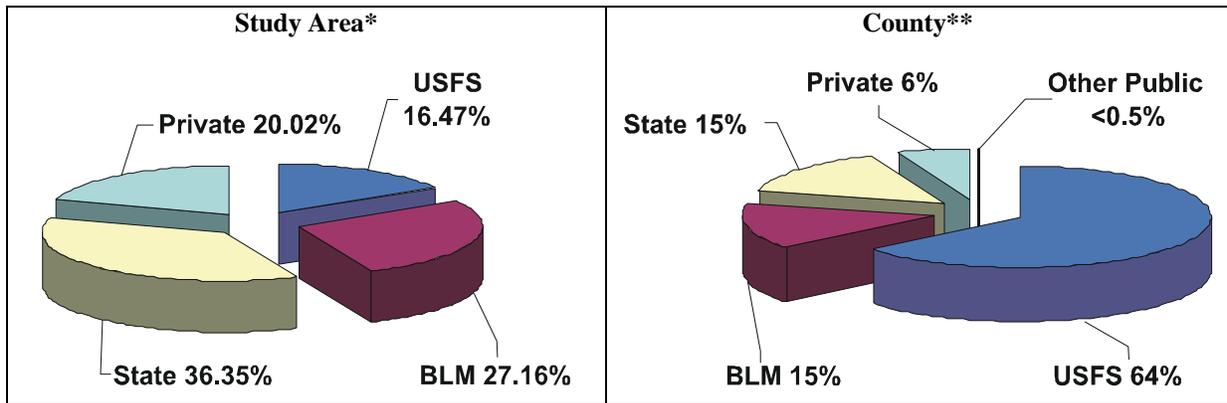
Agency	Percent Area (Square miles)	
	Study Area*	County**
US Forest Service	16.47	64
US Bureau of Land Management	27.16	15
State of Arizona	36.35	15
Private (Individual or corporate)	20.02	6
Other public	0	< 0.5***
Total	100	100

* Lima & Associates

** Greenlee County Comprehensive Plan

*** The County owns approximately 700 acres, or a little over one square mile, of land within the Study area.

FIGURE 3. STATUS OF LAND OWNERSHIP IN GREENLEE COUNTY AND IN SOUTHERN GREENLEE COUNTY STUDY AREA



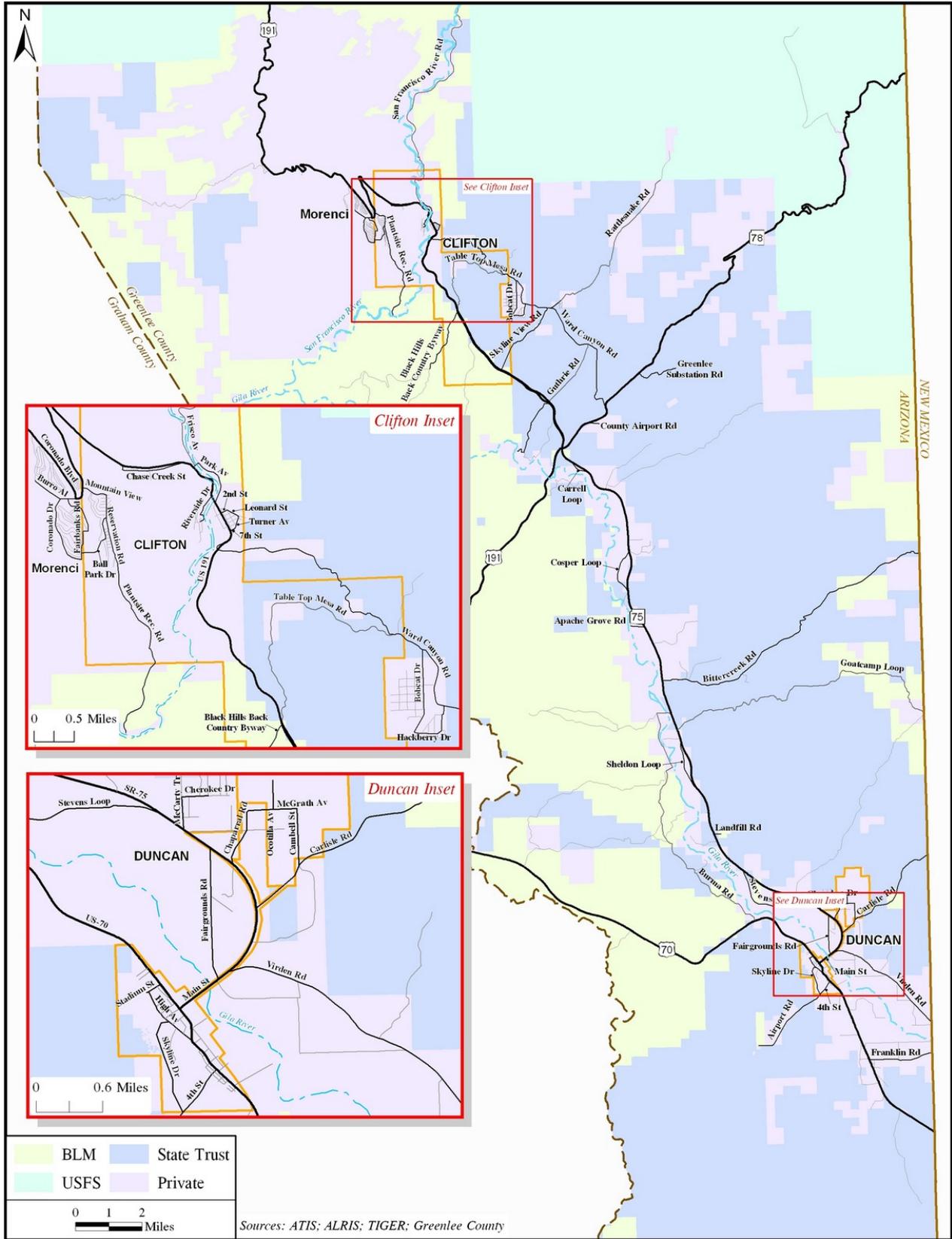
* Lima & Associates

** Greenlee County Comprehensive Plan

Communities

The Towns of Clifton and Duncan are incorporated areas in the study area, while Morenci is a company-owned town. However, a part of Morenci is within the incorporated Town of Clifton. Verde Lee and Loma Linda are also unincorporated areas that lie east of the Clifton limits. The Guthrie/3-Way/York area is near the center of the County and may be an area suitable for incorporation. The Apache Grove, Sheldon, and Sweetwater areas are smaller places along SR 75 going toward Duncan. Duncan includes an area around US 70 and SR 75. Franklin is a small community southeast of Duncan.

FIGURE 4. LAND OWNERSHIP SOUTHERN GREENLEE COUNTY



The Town of Clifton began as a mining town and is the County Seat and the center of government, trade, tourism, and mining. The town sits at an elevation of 3,464 feet and the San Francisco River flows through the town. Clifton is sometimes referred to as the “Gateway to the Coronado Trail” that following US 191 from Clifton north to the town of Springerville and is noted as one of the most scenic drives in Arizona. The Coronado Trail was recently designated a National Byway. The estimated 2005 population of Clifton was 2,495.

Morenci As previously mentioned, Morenci is a company-owned town that is not incorporated and a part of Morenci is within Clifton. The town sits at an elevation of 4,838 feet. The Morenci mining district has evolved into a world class operation providing approximately 18% of the world copper production. Morenci’s 2000 population was 1,879 residents.

The Town of Duncan lies in the County’s primary agricultural area of Duncan Valley. The Gila River flows through the Town. US 70 and SR 75 traverse the Town. The estimated 2005 population was 805 residents. The Town is at an elevation of approximately 3,500 feet.

Economy

Mining is the predominant economic sector in the study area. Farming in the southern portion of the study area is another important economic sector. Public government comprises a third major sector. Southern Greenlee County is becoming increasingly important as a travel attraction in the State of Arizona. Table 17 presents the major employers in the study area.

TABLE 17. MAJOR EMPLOYERS

Clifton	Morenci	Duncan
Clifton Elementary	Fairbanks School - Morenci	Duncan Public Schools
Clifton High School	Morenci Health Care Center - Morenci	Lunt’s Dairy
Greenlee County	Morenci High School - Morenci	Union Pacific Railroad
Town of Clifton	Morenci Public Schools - Morenci	Freeport-McMoRan
	Freeport-McMoRan - Morenci	Greenlee County
		Duncan Valley Electric Coop
		State of Arizona
		Town of Duncan

Source: Greenlee County Public Works, Lima & Associates

Demographic and Environmental Justice Considerations

Population

Table 18 presents the 2000 population and the estimated 2005 population. Figure 5 shows the total population distribution within the study area. Even though the overall population of the

TABLE 18. POPULATION

Area	2000 Population	2005 Population
Clifton	2,596	2,495
Duncan	812	805
Morenci	1,879	NA
Greenlee County	8,547	8,300
Southern Greenlee County Study Area	8,476	8,231*
Arizona	5,130,632	6,044,985

Source: 2000 US Census and July 1, 2005 DES Population Estimates

Estimated by Lima & Associates

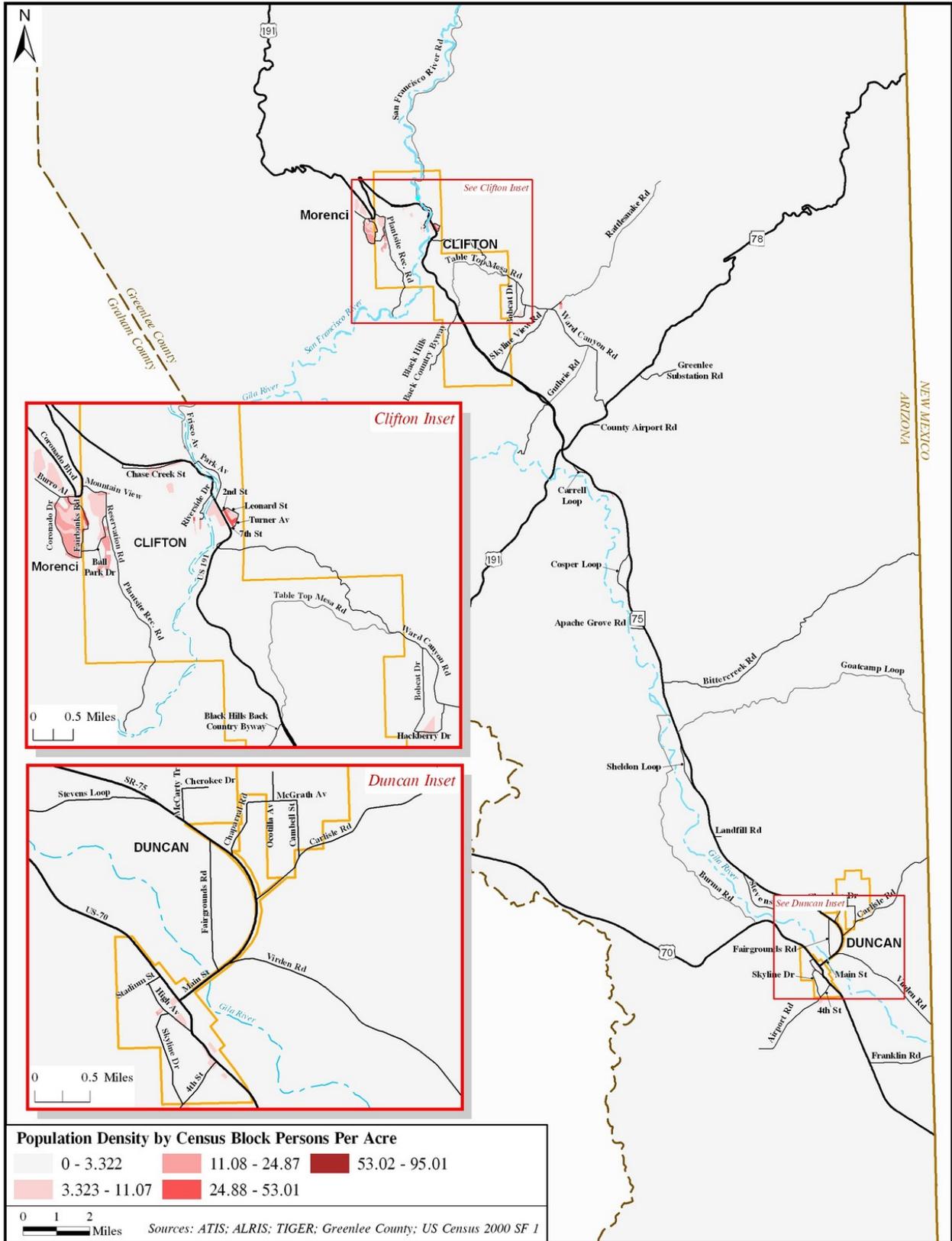
study area is quite small; the population densities by Census block can easily be identified on the map. Most of the study area has a very low population density, while the highest population densities are found in Morenci and Clifton. The highest concentrations are within Morenci in an area bounded by Fairbanks Road, Coronado Drive, and Burro Alley and a strip located east of Reservation Road south of Mountain View. Many persons in Clifton live between 2nd and 7th Streets east of US Highway 191. Duncan's population is mostly low density, with a populated area on the north side of town along Chaparral Road and McGrath Avenue, and one bordering US Highway 70 north and south of its intersection with Main Street. A few scattered pockets of low density population also exist along State Route 75 in the York Valley area.

Title VI and Environmental Justice Considerations

This section presents information on population subgroups that needs to be considered to ensure that these groups are not disproportionately impacted by transportation improvements. Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not discriminated against based on race, color, national origin, age, sex, or disability. Executive Order 12898 on Environmental Justice dictates that any programs, policies, or activities to be implemented are not to have disproportionately high adverse human health and environmental effects on minority populations. Thus, in relation to this study, transportation improvements should not adversely impact such groups disproportionately. A variety of possible alternatives should be developed and considered in order to ensure all groups are fairly represented in the amount and type of transportation services provided.

To ensure that Title VI and Environmental Justice considerations are implemented during the conduct of a project, including the conduct of Environmental Assessments and the development of Environmental Impact Statements, ADOT issued a document entitled *Guidance on Title VI and Environmental Justice*. Even though the precise measures outlined in the Guidance may only apply directly to projects in the development and environmental stage, the same general approach can be utilized in this study to help identify any related issues involved in the planning stage of potential projects.

**FIGURE 5. TOTAL POPULATION DENSITY
SOUTHERN GREENLEE COUNTY**



Demographic statistics are discussed below population subgroups for minorities, elderly, mobility-limited, poverty level, and householders with no automobile.

Minority and Elderly Population

Most of the study area has a very low density minority population; Morenci and Duncan are the areas with the highest density of minorities. As Table 19 shows, the minority population is nearly 60 percent in Clifton and 48 percent in Morenci. The minority population in these areas is focused in the most densely populated parts of the towns. Therefore, Title VI and Environmental Justice factors need to be considered for these areas.

TABLE 19. MINORITY AND AGE 65 AND OVER DEMOGRAPHICS

	Total Minority	Percent Minorities	Total Age 65+	Percent Age 65+
Arizona	1,856,374	36.18%	667,839	13.02%
Greenlee County	3,943	46.13%	849	9.93%
Study Area	3,923	46.28%	842	9.93%
Clifton	1,548	59.63%	283	10.90%
Duncan	276	33.99%	88	10.84%
Morenci	916	48.75%	12	0.64%

Sources: US Census 2000 Summary File 1 (SF 1)
US Census 2000 Summary File 3 (SF 3)

Overall, the population density within the study area of persons aged 65 and older is very low—similar to the density for the total population. Table 19 shows that approximately 10 percent of the population is in this age group and that less than one percent of Morenci’s population is aged 65 and over, and that the percentages of persons in this category living in the Clifton and Duncan areas are virtually identical.

Mobility-Limited and Below Poverty-Level Population and Households with No Automobile

Based on the percentage of mobility-limited population, Environmental Justice considerations must be taken into account for the study area. Table 20 reveals the County has a 21.14 percent mobility-limited population, which is greater than Arizona’s total of 11.63 percent. Clifton, Duncan, and Morenci each have percentages very close to the state’s percentage.

The percentage of the population living below poverty level and the number of households with no automobile must also be considered when evaluating Environmental Justice. The percentage of Morenci’s population living below poverty level, as seen in Table 20, is much

TABLE 20. DEMOGRPAHIC DATA FOR MOBILITY-LIMITED, POVERTY-LIMITED, AND HOUSEHOLDS WITH NO AUTOMOBILES

	Total Mobility- Limited	Percent Mobility -Limited	Total Below Poverty Level	Percent Below Poverty Level	Households with No Automobile	Percent Households with No Automobile
Arizona	596,787	11.63%	698,669	13.62%	140,579	2.74%
Greenlee County	1,792	21.14%	842	9.93%	153	1.81%
Clifton	334	12.87%	292	11.25%	64	2.47%
Duncan	90	11.08%	133	16.38%	26	3.20%
Morenci	228	12.13%	56	2.98%	18	0.96%

Sources: US Census 2000 Summary File 1 (SF 1)
US Census 2000 Summary File 3 (SF 3)

lower than the statewide percentage of 13.62. However, 16.38 percent of Duncan residents live below the poverty level, a higher percentage than that of the state as a whole.

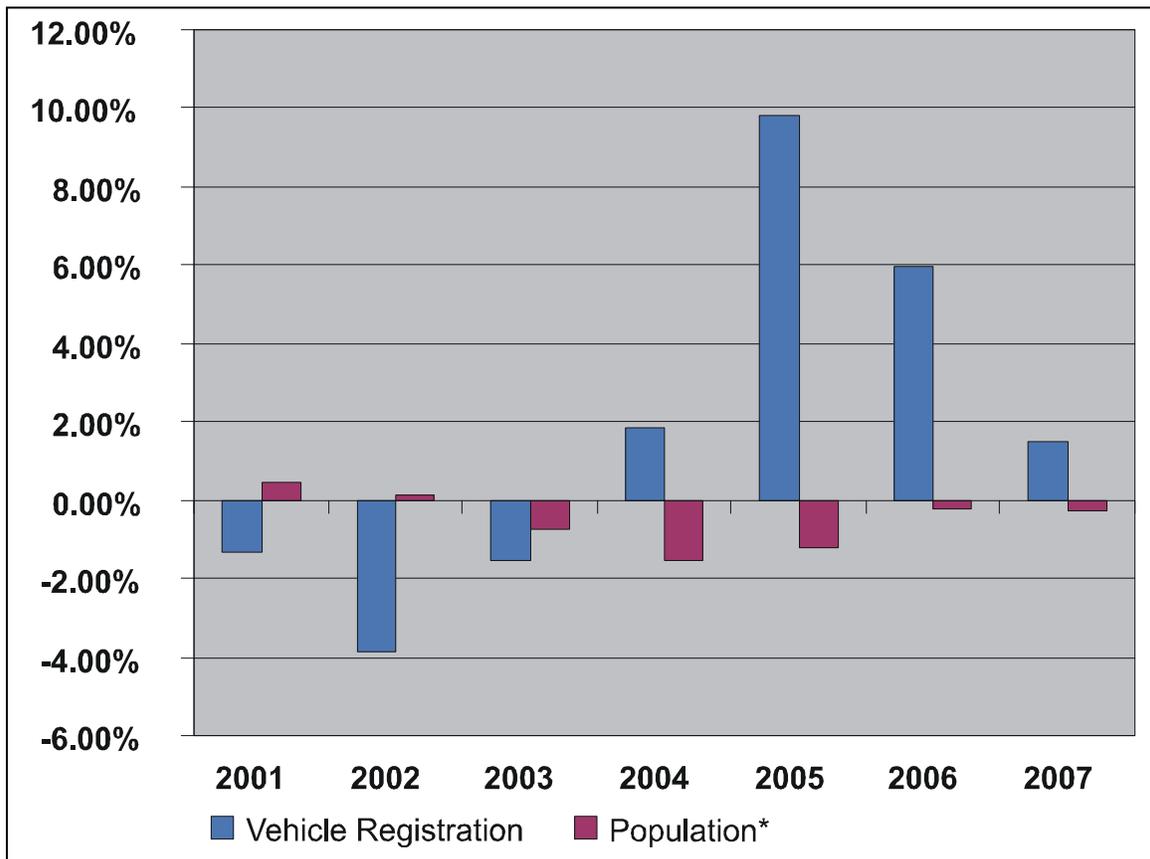
A correlation appears to exist between the population living below poverty level and the number of households with no automobile, because similar trends can be seen for this data. Duncan has the highest percentage of households with no automobile, and Morenci has the lowest, with less than one percent. Clifton remains close to the state's 2.74 percent of households with no automobile.

County Population Trends

The Arizona Department of Economic Security population estimates and projections indicate a steady decline in County population from 8,547 in the 2000 Census to a projected figure of 8,259 in 2007. County and local agency officials question whether these estimates and projections over-estimate the rate of population decline, and an analysis of the change in the numbers of motor vehicles registered in the County suggest that area population may have actually increased in recent years.

Figure 6 presents a comparison of the percent changes in County population and motor vehicle registration. The ADOT Motor Vehicle Division records show that motor vehicle registration in the County declined from 10,436 vehicles in 2000 to a low of 9,747 vehicles in 2003 and has been increasing since then. ADOT MVD reports that 11,727 vehicles are registered in the County in Fiscal 2007, even more than were registered in 2000.

FIGURE 6. PERCENT CHANGES IN GREENLEE COUNTY POPULATION COMPARED TO PERCENT CHANGES IN VEHICLE REGISTRATION



*DES Population Estimates for Years 2001 through 2005, DES Projections for 2006 and 2007
 Sources: Arizona Department of Economic Security; Arizona Department of Transportation, Motor Vehicle Division

CURRENT TRANSPORTATION CONDITIONS

Roadways

Figure 1, presented earlier, illustrates the 90.75 miles of regionally significant roads that have been identified for this study. Table 21 summarizes characteristics of the regionally significant roads. The existing Greenlee County roadway system consists of a network of state highways, county roads, and local roads connecting communities and providing access to land uses throughout the region. State highways serving the study area include US 70, US 191, SR 78, and SR 75. US 70 cuts through the southern tip of the county, connecting west to Safford, and east into New Mexico. US 191 and SR 78 travel generally northeast through the County providing a northern route to Safford. US 191 continues from Morenci into the Apache National Forest and ultimately to the community of Alpine and Apache County. SR 75 serves as the main north/south corridor between the Clifton and the Duncan areas.

TABLE 21. SUMMARY OF CHARACTERISTICS OF REGIONALLY SIGNIFICANT ROADS

Road	From	To	Length (Miles)	Jurisdiction	Lanes	Miles Surface Type	
						Paved	Unpaved
Frisco Avenue	US 191	Clifton Limits	1.33	Clifton	2	1.33	0
San Francisco River Road	Frisco Avenue	End	7.01	Unincorporated	2	0	7.01
Chase Creek Street	US 191	US 191	0.83	Clifton	2	0.83	0
East Bridge Street	Frisco Avenue	Park Avenue	0.06	Clifton	2	0.06	0
Park Avenue	East Bridge Street	US 191	0.65	Clifton	2	0.65	0
Burro Alley	US 191	Aristata Drive	0.59	Unincorporated	2	0.59	0
Coronado Drive	Burro Alley	Fairbanks Road	0.94	Unincorporated	2	0.94	0
Fairbanks Road	Burro Alley	Coronado Drive	0.95	Unincorporated	2	0.95	0
Ball Park Drive	Fairbanks Road	Indian Road	0.4	Clifton	2	0.4	0
Indian Road	Ball Park Drive	Reservation Road	0.29	Clifton	2	0.29	0
Mountain Avenue	US 191	Mountain View	0.33	Clifton	2	0.33	0
Mountain View	Mountain Avenue	Reservation Road	0.28	Clifton	2	0.28	0
Reservation Road	Mountain View	Plantsite Rec. Road	0.5	Clifton	2	0.5	0
Plantsite Rec. Road	Reservation Road	San Francisco River	2.56	Clifton/Unincorp	2	1.52	1.04
Riverside Drive	US 191	Shannon Road	0.24	Clifton	2	0.24	0
Shannon Road	Riverside Drive	Inca Drive	0.19	Clifton	2	0.19	0
2 nd Street	US 191	Leonard Street	0.09	Clifton	2	0.09	0
Leonard Street	2 nd Street	Turner Avenue	0.16	Clifton	2	0.16	0
Turner Avenue	Leonard Street	7 th Street	0.16	Clifton	2	0.16	0
Table Top Mesa Road	US 191	Wards Canyon Road	3.34	Clifton	2	0	3.34
Wards Canyon Road	Table Top Mesa Road	SR 78	6.2	Clifton/Unincorp	2	0.43	5.77
Black Hills Back Country Byway	US 191	Hot Springs Road	2.07	Clifton/Unincorp		1.19	0.88
Bobcat Drive	Wards Canyon Road	Hackberry Drive	1.08	Unincorporated	2	1.08	0
Hackberry Drive	Bobcat Drive	Wards Canyon Road	0.67	Unincorporated	2	0.67	0
Rattlesnake Road	Wards Canyon Road	Forest Service Bndy	5.5	Unincorporated	2	0	5.5
Skyline View Road	US 191	Wards Canyon Road	2.46	Clifton/Unincorp	2	2.46	0

TABLE 21. SUMMARY OF CHARACTERISTICS OF REGIONALLY SIGNIFICANT ROADS (Continued)

Road	From	To	Length (Miles)	Jurisdiction	Lanes	Miles Surface Type	
						Paved	Unpaved
Guthrie Road	US 191	Wards Canyon Road	2.14	Unincorporated	2	0	2.14
Guthrie Road	US 191	Gila River	2.14	Unincorporated	2	0	2.14
Greenlee Substation Road	SR 78	End	1.32	Unincorporated	2	0	1.32
County Airport Road	SR 78	End	0.31	Unincorporated	2	0.31	0
Carrell Loop	SR 75	SR 75	0.59	Unincorporated	2	0.59	0
Cosper Loop	SR 75	SR 75	1.48	Unincorporated	2	1.48	0
Apache Grove Road	SR 75	Gila River	0.41	Unincorporated	2	0.41	0
Bittercreek Road	SR 75	End (State Line)	9.58	Unincorporated	2	9.58	0
Goatcamp Loop	SR 75	End (State Line)	9.45	Unincorporated	2	9.45	0
Sheldon Loop	SR 75	SR 75	1.63	Unincorporated	2	1.63	0
Burma Road	SR 75	US 70	8.68	Unincorporated	2	8.68	0
Stevens Loop	SR 75	SR 75	2.8	Unincorporated	2	2.8	0
McCarty Trail	SR 75	Cherokee Drive	0.29	Unincorporated	2	0.29	0
Cherokee Drive	McCarty Trail	Shoshone Lane	0.24	Unincorporated	2	0.24	0
Chaparral Road	SR 75	McGrath Avenue	0.59	Duncan	2	0.59	0
McGrath Avenue	Chaparral Road	Cambell Street	0.37	Duncan	2	0.37	0
Cambell Street	McGrath Avenue	Carlisle Road	0.51	Duncan	2	0	0.51
Ocotilla Avenue	McGrath Avenue	End	0.26	Duncan	2	0.26	0
Carlisle Road	SR 75	End (State Line)	3.81	Duncan/Unincop	2	0	3.81
Fairgrounds Road	SR 75	SR 75	1.19	Unincorporated	2	1.19	0
Virden Road	SR 75	End (State Line)	3.75	Unincorporated	2	3.75	0
Stadium Street	US 70	High Avenue	0.15	Duncan	2	0.15	0
High Avenue	Stadium Street	US 70	0.6	Duncan	2	0.6	0
Skyline Drive	High Avenue	4th Street	0.93	Duncan	2	0.93	0
4th Street	US 70	Skyline Drive	0.5	Duncan	2	0.5	0
Airport Road	Skyline Drive	End	2.56	Unincorporated	2	0	2.56
Franklin Road	US 70	End (State Line)	1.92	Unincorporated	2	1.92	0

Figure 7 illustrates the number of lanes for state highways and county and local roads on the study area network. The majority of roads are two lanes except for portions of SR 75 where there are climbing lanes or four lanes. Approximately 40.75 miles of county and local roads on the study area network are paved and 55 miles are unpaved roads (see Figure 8). Other significant streets in the study area are located in the Towns of Duncan and Clifton and are generally paved roads.

Structures

The National Bridge Inventory includes 36 bridges and culverts in the study area within the County. Bridge sufficiency ratings for County and locally owned bridges and culverts are presented in Table 22. Six bridges have been identified to be replaced. Examples of bridges the County wishes to improve, for which Transportation Enhancement Funds have been applied through SEAGO, are shown in Figure 9. The condition categories for ranges of sufficiency ratings are shown in Table 23.

Traffic Characteristics

Average Daily Traffic for various county and local roads in the southern Greenlee County study area is presented in Table 24 for the years 2000, 2003, and 2006. Estimated 2006 ADT varies from about 50 vehicles per day on Sheldon Loop west of SR 75 to approximately 950 vehicles per day on Ward Canyon Road east of US 191. As shown in Table 25, the traffic mix on three county roads in the year 2000 varied from 21.0 percent trucks on Carroll Loop to 29.1 percent trucks on Wards Canyon Road. Figure 10 presents the 2006 ADT for roads in the study area.

Average Annual Daily Traffic (AADT) for state highways in the study area is presented in Table 26. The estimated 2006 AADT on US 70 varies from 1,125 vehicles per day from SR 191 to 1,430 vehicles per day at the New Mexico line. The 2006 estimated AADT on US 75 varies from 1,340 to 2,550 vehicles per day between Virden Road and the US 191/SR 78 intersection. The SR 78 2006 AADT was approximately 265 vehicles per day.

The SR 191 AADT was approximately 2,755 vehicles per day from US 70 to the SR 78/SR 75 intersection. From the SR 78/SR 75 intersection to UX 191, the SR 191 AADT varied from 6,120 to 6,935 vehicles per day.

FIGURE 7. NUMBER OF LANES - SOUTHERN GREENLEE COUNTY

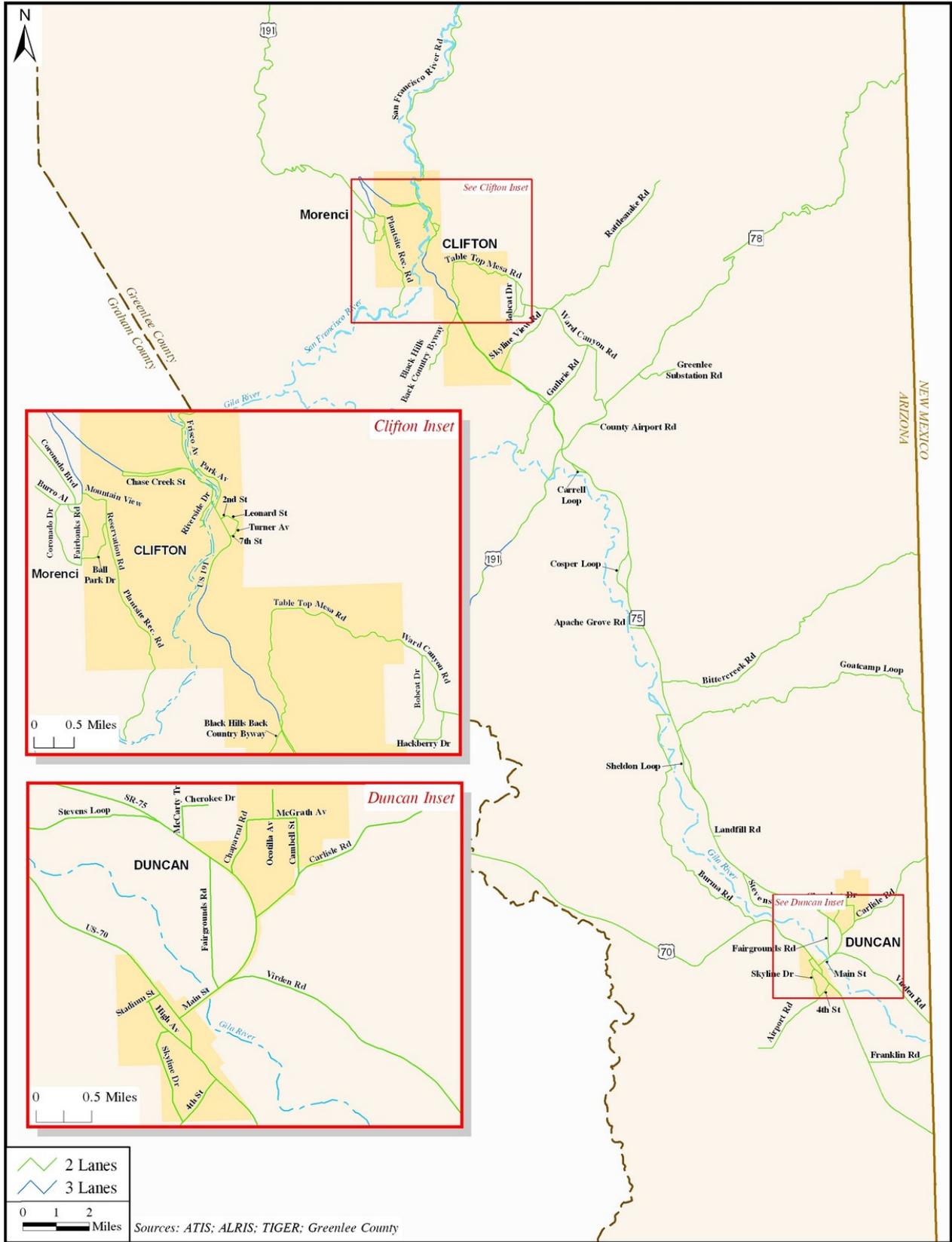


FIGURE 8. SURFACE TYPE - SOUTHERN GREENLEE COUNTY

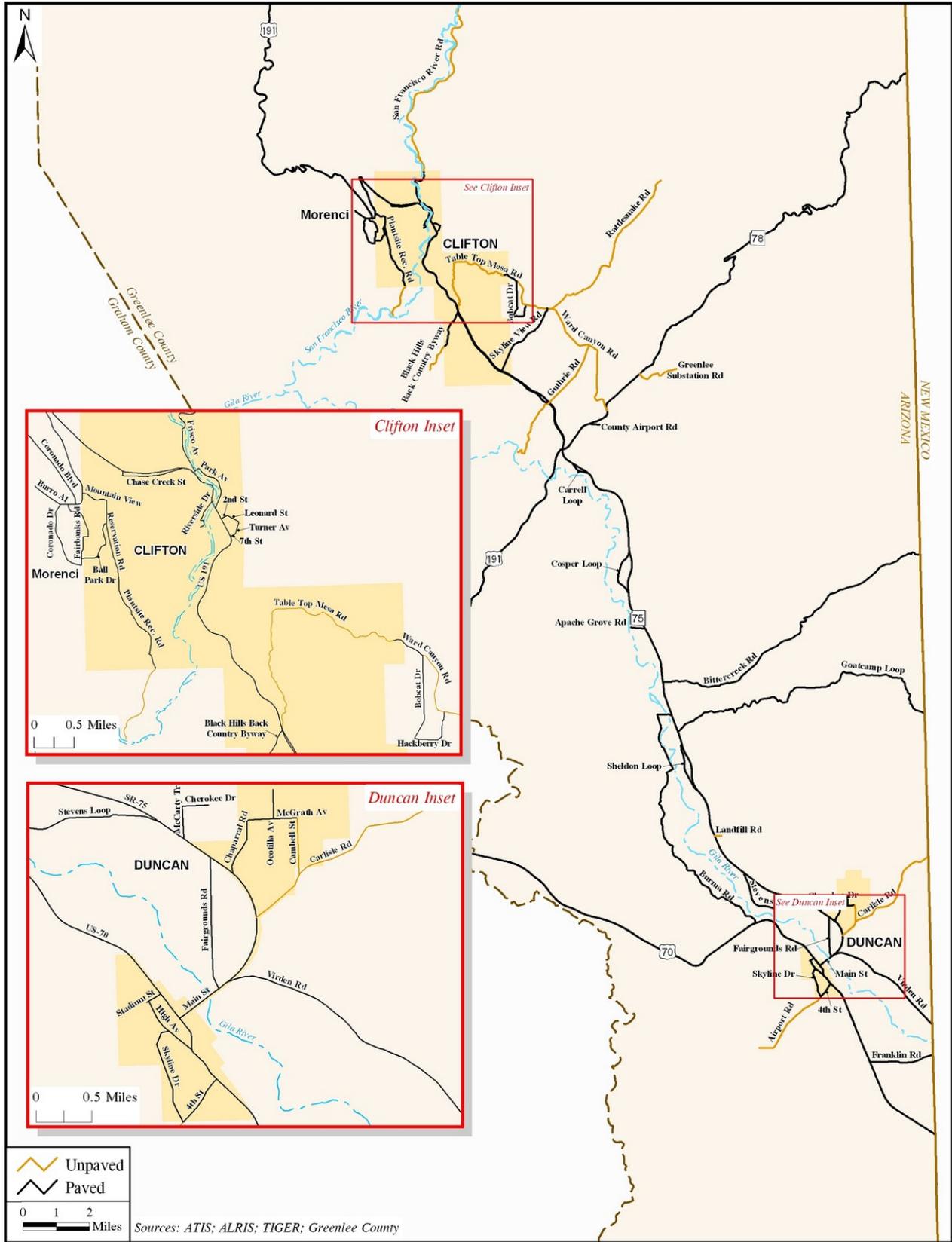


TABLE 22. SOUTHERN GREENLEE COUNTY BRIDGE SUFFICIENCY RATINGS – COUNTY AND LOCAL STRUCTURES

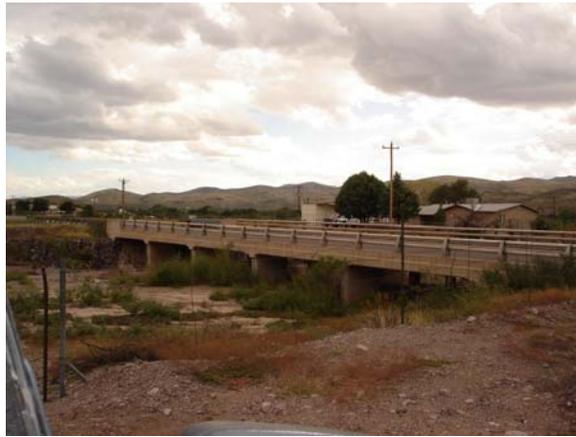
Structure Name	Road Name	Location	Year Built	Year Reconstr	Agency	Sufficiency Rating	Condition
SPRR UP	SPRR UP	300 ft E of Jct US 191	1900	---	Clifton	-1.00	Replacement
San Francisco River Bridge	Park Avenue	100'W of US 191	1917	---	Clifton	24.55	Replacement
Chase Creek Bridge #1	Frisco Avenue	0.1 mi N of Park Ave	1901	---	Clifton	38.37	Replacement
Chase Creek Bridge #2	Coomb Street	50'S Jct US 191	1900	---	Clifton	56.21	Rehabilitation
Chase Creek Bridge #3	Chase Creek Road	200'S Jct US 191	1920	---	Clifton	56.41	Rehabilitation
Chase Creek Bridge	City Parking Lot	adjacent to # 307 on 191	1915	1925	Clifton	79.48	Rehabilitation
Rosenbaum Bridge	Patterson Road	0.6 mi N US 191	1987	---	Clifton	92.26	Good
Abandoned RR OP	Old Safford Road	2.71 mi W Jct US 191	1917	---	Unincorporated	39.84	Replacement
Medium Wash Bridge	Stevens Loop Road	0.7 mi W Jct SR 75	1935	---	Unincorporated	42.13	Replacement
Packer Wash Bridge	Fairgrounds Road	0.4 mi N Jct SR 75	1935	---	Unincorporated	42.21	Replacement
SPRR Overpass	Old Safford Road	1.05 mi W Jct US 191	1907	---	Unincorporated	55.76	Rehabilitation
Waters Wash Bridge	Stevens Loop Road	0.5 mi S Jct SR 75	1935	---	Unincorporated	60.31	Rehabilitation
Goat Camp Canyon Bridge	Sheldon Loop Road	1.0 mi S Jct SR 75	1934	---	Unincorporated	61.33	Rehabilitation
Gila River Bridge	Old Safford Road	3.97 mi W Jct US 191	1918	---	Unincorporated	67.26	Rehabilitation
Soap Box Canyon Bridge	Wards Canyon Road	3.39 mi E Jct US 191	1915	1975	Unincorporated	68.92	Rehabilitation
Pumroy Canyon Bridge	Old Safford Road	6.4 mi W Jct US 191	1921	---	Unincorporated	70.43	Rehabilitation
RCB	Viriden Highway	1.14 mi E of SR 75	1949	---	Greenlee Co	87.96	Good
RCB	Viriden Highway	1.94 mi E of SR 75	1948	---	Greenlee Co	82.71	Good
Rocky John Cyn RCB	Cosper Loop Road	1.0 mi S Jct SR 75	1900	---	Greenlee Co	95.91	Good
Burleson Canyon RCB	Viriden Highway	0.57 mi E of St Rt 75	1948	---	Greenlee Co	96.50	Good
Willow Creek RCB	Carrell Loop Road	0.5 mi S Jct SR 75	1941	---	Greenlee Co	100.00	Good

Source: 2003 Greenlee County Comprehensive Plan, 2003

Rehabilitation – indicated bridge needs some type of treatment such as paving deck

Replacement – indicates that bridge may need to be replaced.

FIGURE 9. EXAMPLE BRIDGE TRANSPORTATION ENHANCEMENT PROJECT CANDIDATES

	<p>Structure 8150 shown here is an active railroad overpass on the Old Safford Highway. It and a companion Structure 8151, which spans an abandoned railroad right-of-way, are listed on the National Register of Historic Places. The Southeastern Arizona Governments Organization has submitted an application for Transportation Enhancement funds to rehabilitate both bridges.</p> <p>—Lima & Associates photo</p>
<p>Pictured is one of four wood bridges on County roadways proposed to be rehabilitated by means of a Transportation Enhancement grant that has been applied for through SEAGO. Two of the bridges are on Stevens Loop, one is on Sheldon Loop, and one is located on Fairgrounds Road in Duncan.</p> <p>—Lima & Associates photo</p>	
	<p>As the second phase of the York Valley Pedestrian Walkway project, a 150-foot pedestrian bridge will be built on the near side of this SR 75 highway bridge over Cottonwood Creek. A future phase III will continue the Walkway south from the south end of the bridge.</p> <p>—Lima & Associates photo</p>

Source: Greenlee County Public Works, Southeastern Arizona Governments Organization

TABLE 23. BRIDGE SUFFICIENCY RATING METRICS

Bridge Sufficiency Rating (BSR)	Category
> 80	Good Condition
50 - 80	Eligible for rehabilitation
< 50	Eligible for replacement

Source: ADOT 1999 Status Condition and Report of the Arizona Highway System
 Rehabilitation – indicated bridge needs some type of treatment such as paving deck
 Replacement – indicates that bridge may need to be replaced.

**TABLE 24. DAILY TRAFFIC VOLUMES – COUNTY AND LOCAL ROADS
SOUTHERN GREENLEE COUNTY STUDY AREA**

Location	2000	2003	2006
7th St. North of US 191	NA	345	380
Carroll Loop 0.2 mi. South of Hwy 75	139	42	100
Chase Creek St. West of US 191	NA	290	330
Fairgrounds Rd. 0.5 mi. North of Hwy 75	115	198	250
Franklin Rd. Btwn. McGrath & Model	150	277	355
Old Virden Rd. Btwn. Hwy. 75 & Clesa R	60	92	110
Park Ave. 0.1 mi. North of Coronado Blvd.	318	323	325
Riverside Rd. South of US 191	NA	323	365
Rocky John Loop 0.1 mi. West of Hwy 75	76	94	100
Sheldon Loop 0.1 mi. North of Sheldon Swinging	27	77	125
Skyline View 0.2 mi. North of Hwy 191	441	729	890
Stephens Loop 0.1 mi. West of Hwy 75	45	17	50
Virden Rd. S/O Btwn. Clesa & Luntville	677	303	500
Wards Canyon Rd. East of Hwy. 191	510	794	950

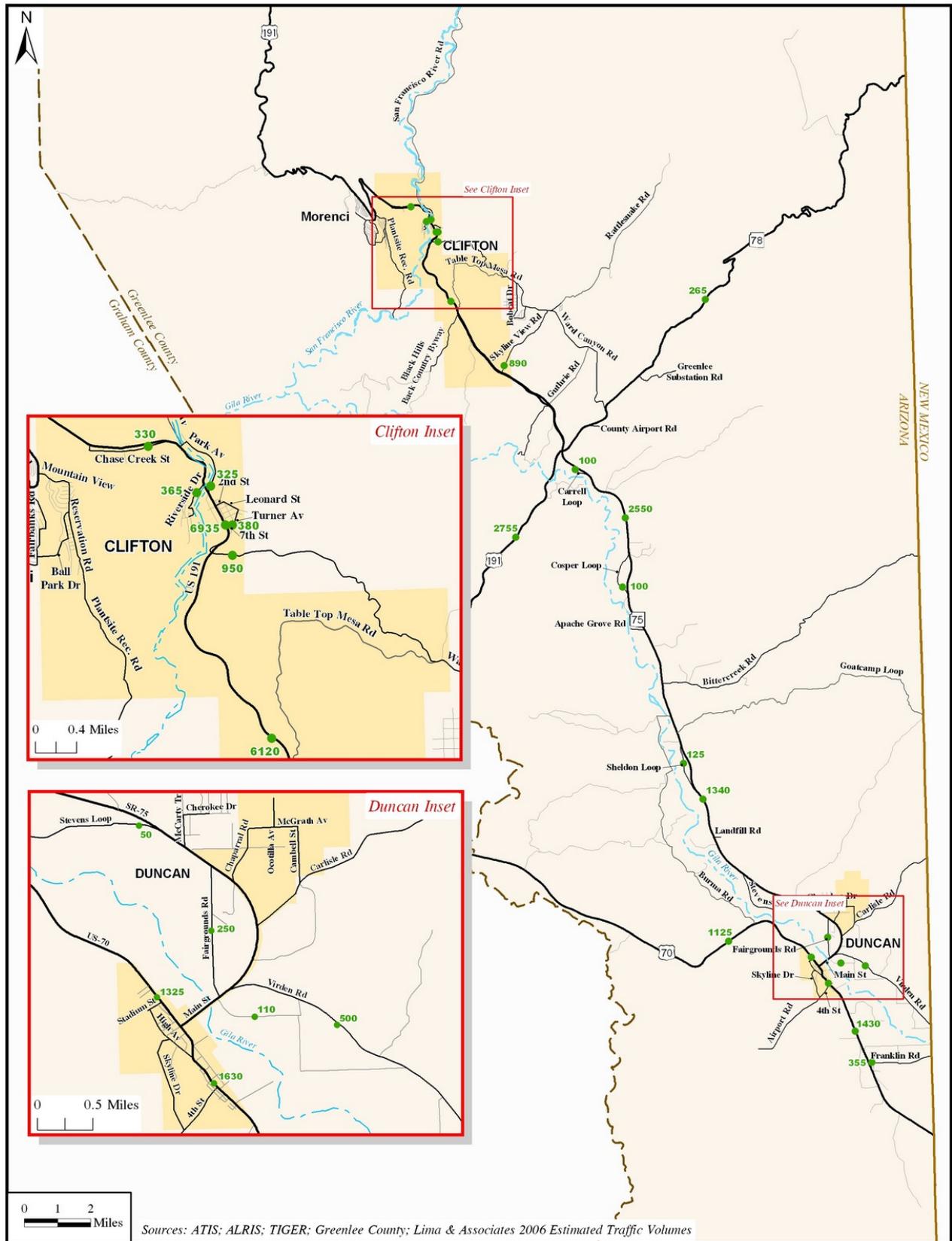
Source: 2000 traffic counts: 2000 ADOT Special Counts for Air Quality & Rural HPMS Programs, March 2000
 2003 traffic counts: TRA, 2003
 2006 Estimated Traffic Volumes, Lima & Associates

**TABLE 25. AVERAGE DAILY TRAFFIC BY VEHICLE TYPE
SOUTHERN GREENLEE COUNTY STUDY AREA**

Road	Cars & Trailers	Trucks		Total
		2-Axle	Multi-Axle	
Wards Canyon Rd, East of SR 191	70.6%	28.0%	1.1%	29.1%
Carroll Loop, South of SR 75	78.7%	18.7%	2.3%	21.0%
Old Virden Rd, Between SR 75 & Clesa	73.3%	25.0%	1.6%	26.6%

Source: 2000 traffic counts: 2000 ADOT Special Counts for Air Quality & Rural HPMS Programs, March 2000

FIGURE 10. 2006 ADT FOR ROADS IN THE STUDY AREA



**TABLE 26. AVERAGE ANNUAL DAILY TRAFFIC VOLUMES
ARIZONA STATE HIGHWAYS IN SOUTHERN GREENLEE COUNTY**

Route	BMP	Start	EMP	End	Length	2002	2003	2004	2006
US 70	349.48	US-191 (North)	378.48	Wilson St	29.00	1,100	1,100	1,100	1,125
US 70	378.48	Wilson St	378.91	SR-75 (Duncan)	0.43	1,300	1,200	1,300	1,325
US 70	378.91	SR-75 (Duncan)	379.79	7th St	0.90	2,200	1,500	1,600	1,630
US 70	379.79	7th St	385.25	New Mexico State Line	5.42	1,500	1,400	1,400	1,430
SR 75	379.46	Viriden Rd	391.85	Apache Grove Rd	12.36	1,400	1,200	1300	1,340
SR 75	391.85	Apache Grove Rd	398.43	US-191 / SR-78	6.49	2,100	2,,200	2500	2,550
SR 78	154.55	US-191/SR-75 (South of Clifton)	174.73	New Mexico State Line	19.46	390	250	260	265
US 191	130.64	US-70 (E of Safford)	154.52	SR-78/SR-75 (Guthrie)	23.77	2,600	2700	2700	2,755
US 191	154.52	SR-78/SR-75 (Guthrie)	163.07	7th St	8.45	4,300	4,400	6000	6,120
US 191	163.07	7th St	163.95	UX-191	0.99	5,400	5,600	6800	6,935

Source: ADOT Data Team – 2002 -2004 counted volume
Lima & Associates – estimated 2006 volumes

Crash Analysis

From May 2001 through April 2006, 300 traffic crashes occurred in Southern Greenlee County, according to the Accident Location Identification Surveillance System (ALISS) Database. Table 27 presents a summary of the crashes. Figure 11 depicts the crash locations and Figure 12 shows the fatal crashes.

Depending upon the speed involved, roadway geometrics at the crash location, road and weather conditions, driver reaction, and other issues, a traffic crash may involve one or more phases. For example, two cars may first collide; subsequently one or both may overturn, strike a third vehicle, or strike a fixed object. The First Harmful Definition is the first action that causes damage to a motor vehicle, its occupants, a pedestrian, or a fixed object.

Of the crashes reported during the time period, 100, or one-third of the total, began as a collision of a motor vehicle with a fixed object. The second most frequent “first harmful definition” was a collision with another motor vehicle, of which 80 crashes, or 26.67 percent of the total, were recorded.

Most crashes on Greenlee County roads did not take place at intersections. However, 15.33 percent of the crashes were intersection related and another 4.33 percent were driveway access related. Over one-fourth of the motorists involved in crashes were cited for “Speed Too Fast for Conditions” and another 13 percent were cited for “Inattention.” Over one-fourth were not cited.

In summary, 60 percent of the crashes were caused by either collision with a fixed object or with another motor vehicle 72 percent of the crashes were of the single vehicle type. “Speed Too Fast for Conditions” was the most common violation listed. Most of the crashes (225), and the five fatal crashes took place on State or US Highways. Three of the fatal crashes involved a collision with another motor vehicle and two involved a collision with a fixed object.

Of the 300 crashes reported during the period, 54 occurred on SR 75, 28 on SR 78, 26 on US 70, and 117 on US 191. Other Study Area roadways experiencing multiple crashes include Burro Alley, Skyline View Road, and Ward Canyon Road in Clifton, each of which had five crashes. Cholla Road experienced four, as did Skyline Drive in Duncan. Duncan’s Main Street had three crashes. Several of the roadways experiencing multiple crashes, such as Burro Alley and Coronado Drive, are private local roadways.

TABLE 27. SUMMARY OF TRAFFIC CRASHES IN STUDY AREA

Relationship of Crash to Intersection	No. of Crashes	Percentage	Predominant Violation	No. of Crashes	Percentage
Occurred at Intersection	46	15.33%	No Improper Driving	77	25.67%
Non-Intersection Related	241	80.33%	Speed Too Fast for Conditions	76	25.33%
Driveway Access Related	13	4.33%	Inattention	39	13.00%
Total	300	100.00%	Other	26	8.67%
			Unknown	24	8.00%
			Failed to Yield Right-Of-Way	20	6.67%
			Drove in Opposing Traffic Lane	10	3.33%
			Exceeded Lawful Speed	10	3.33%
			Made Improper Turn	7	2.33%
			Other Unsafe Passing	4	1.33%
			Followed Too Closely	2	0.67%
			Knowingly Operated with Faulty or Missing Equipment	2	0.67%
			Unsafe Lane Change	2	0.67%
			Ran Stop Sign	1	0.33%
			Total	300	100.00%
Injury Severity	No. of Crashes	Percentage	First Harmful Definition	No. of Crashes	Percentage
Non-injury Accident	206	68.67%	Overturning	40	13.33%
Non-incapacitating Injury Accident	48	16.00%	Collision with other Motor Vehicle	80	26.67%
Unknown	2	0.67%	Collision with Pedestrian	1	0.33%
Incapacitating Injury Accident	21	7.00%	Collision with Pedalcyclist	2	0.67%
Possible Injury Accident	18	6.00%	Collision with Animal or Livestock	42	14.00%
Fatal Accidents	5	1.67%	Collision with Fixed Object	100	33.33%
Total	300	100.00%	Miscellaneous	35	11.67%
			Total	300	100.00%
Type of Crash	No. of Crashes	Percentage			
Single Vehicle	216	72.00%			
Angle	17	5.67%			
Backing	9	3.00%			
Head-On	5	1.67%			
Left Turn	2	0.67%			
Non-Contact (mc)	3	1.00%			
Other	9	3.00%			
Rear-End	15	5.00%			
Sideswipe (Opposite Direction)	4	1.33%			
Sideswipe (Same Direction)	17	5.67%			
U-Turn	3	1.00%			
Total	300	100.00%			

FIGURE 11. SOUTHERN GREENLEE COUNTY CRASH LOCATIONS

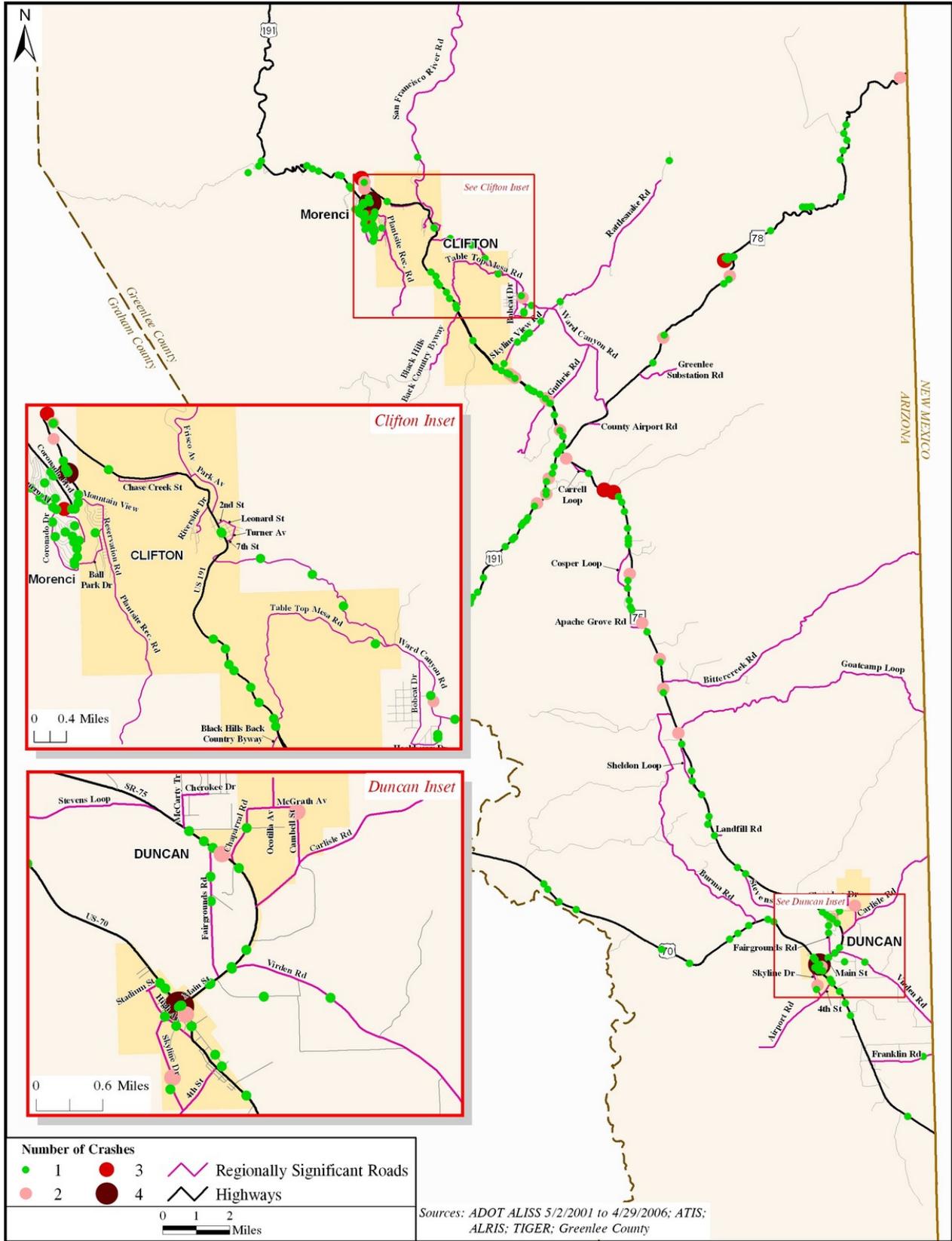
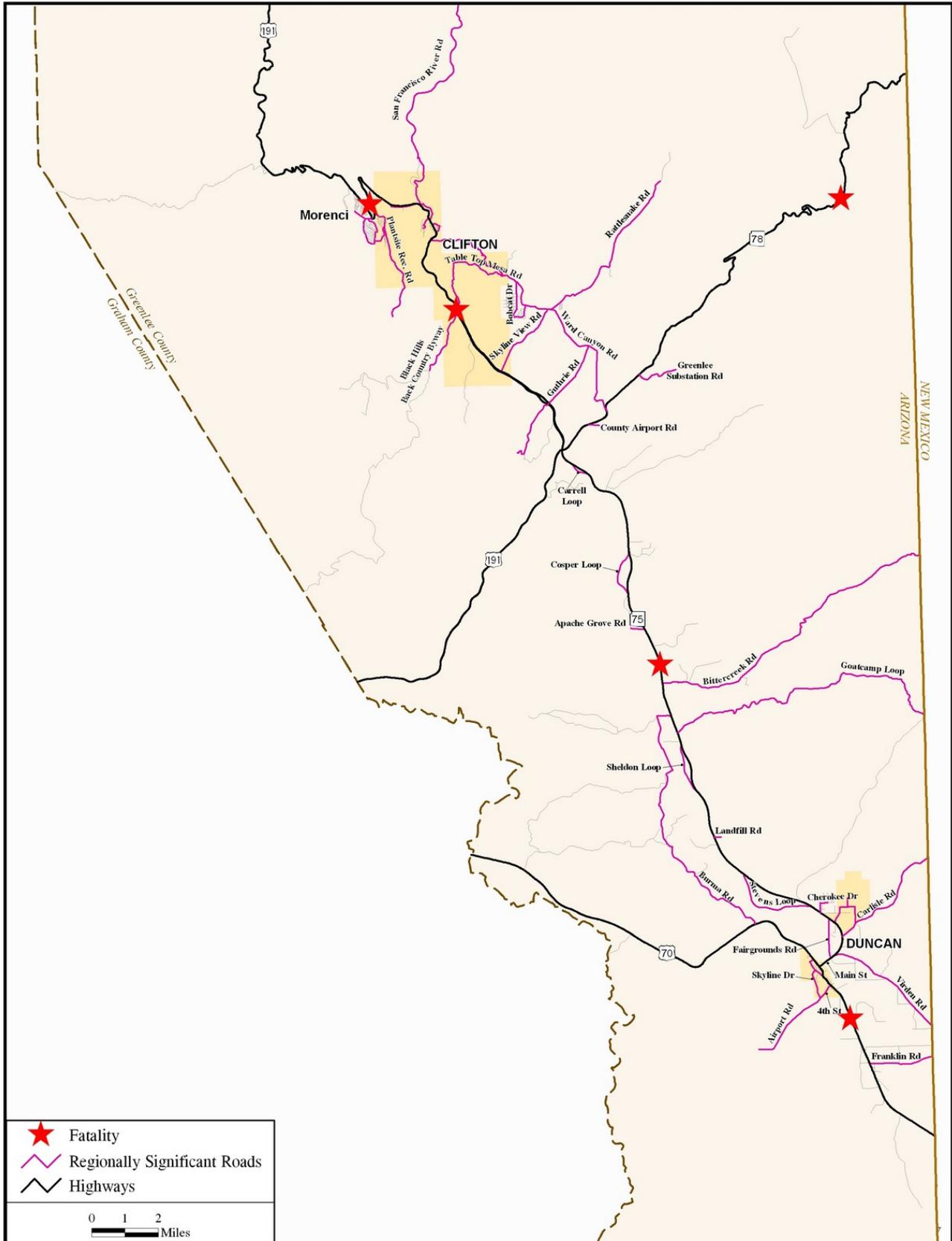


FIGURE 12. SOUTHERN GREENLEE COUNTY FATAL CRASHES



Access Roads and Trails

In addition to the county roads, various roads and trails provide access to utilities, ranches, mines, natural resources, and residential properties. Many of these facilities are used for recreation; however, the facilities are privately owned. Although many access roads and trails are privately owned, there may be opportunities for public use. Several abandoned railroad right-of-ways (ROW) in the County may be opportunities for recreational purposes.

Non-Motorized Travel

Greenlee County has not developed specific facilities for pedestrian, equestrian, or bicycle travel. A number of private trails and abandoned rail lines exist that could become part of a County multiuse path or trail system. The Apache-Sitgreaves National Forest contains a number of trails. Outside the Forest, pedestrians and bicyclists simply use the edges of the roadways. A trail system should be connected to the Forest System and trail maps should be prepared.

Multiuse Pathways

A multiuse pathway is being designed in the York Valley area on the east side of SR 75 and extends from Sexton's County Store to Cottonwood Creek. Figure 13 depicts a portion of the area where this pathway would be located. The County would like to improve the pathway and extend it south of Cottonwood Wash by means of adding a pedestrian walkway to the east side of the SR 75 Cottonwood Creek Bridge. The bridge was previously depicted in Figure 9.

FIGURE 13. YORK VALLEY PEDESTRIAN WALKWAY SITE



Lima & Associates Photo

The **Sandra Day O'Connor Walkway** is a Transportation Enhancement Project in the Town of Duncan of approximately 1,600 feet in length on the southeast side of US 70. The Walkway will begin near the Duncan Town Limits and continue east to Wilson Street. The 5-foot concrete walkway will be paralleled by a 4-foot strip for landscaping, and will include benches and drinking fountains.

Total funding for the Walkway project is \$217,600. Final assessment of the project is scheduled for the fourth week of January 2008.

A **Clifton Enhancement Project** will consist of a 1,898 foot pedestrian sidewalk on the north (east) side of US 191 (North Coronado Boulevard) in the Clifton area.

The ADA-compliant sidewalk will extend from the end of the existing sidewalk at the Baldarama Hair Salon and connect to the sidewalk at the Copper Crystal Park. The project will include a new prefabricated concrete pedestrian bridge over Chase Creek, as well as provision for bicycles and landscaping. Total cost of the project is \$277,895.

TRANSPORTATION ISSUES

The following is a discussion of issues that have been identified through a review of the *2003 Greenlee County Comprehensive Plan* and other documents and conversations with stakeholders.

Traffic and Access Issues

- Southern Greenlee County roads lack continuity and connectivity with a limited county network. Currently, the County roads are a system of finger or tributary roads tied to the State Highway System.
- Travel in Greenlee County is reliant on the State Highway System with regional travel conflicting at times with local access needs.
- Emergency access is a critical issue in this large, spread out region, both in terms of limited alternative routes and inclement conditions.
- Access to private development, provided by a number of secondary roadways within the study area, must be balanced with environmental and cost issues.
- The improvement of roads and rights-of-way for access and safety reasons must be weighed against increases in traffic and potential impacts.
- Need to support access to the Morenci mine and mining activities on both local and state roadways.
- Improve access to the Clifton Morenci Airport (CFT) and access to the future redeveloped O'Connor Field in Duncan.
- Railroad crossings cause vehicular delays daily.

Planning and Coordination Issues

- Greenlee County must develop partnerships to coordinate transportation improvements among ADOT, State Lands, Bureau of Land Management (BLM), Freeport-McMoRan, and other private land owners. This would establish a foundation for good management of the transportation system. Partnering would include identifying land ownership, defining right-of-way ownership, surveying where needed, and inventorying.
- As with any jurisdiction there is a deficiency in roadway construction and maintenance funding.
- Road maintenance, including maintenance of private roads, is an important element in providing good travel conditions.
- Coordination is important to target maintenance funds where they are most needed.
- Uniform roadway standards among the County and the Towns are needed.

Trails Issues

- Funding options must be identified for trails and other pedestrian, equestrian, and recreational facilities.
- Policies need to be developed regarding designating trails for all-terrain vehicle use.
- Trail system needs to accommodate different types of users (e.g. equestrian, off-highway vehicle, bicycle, and pedestrian).
- Policies need to be adopted for avoiding or resolving conflicts between different types of trail use.

Dial-a-Ride Issues

- Plans for implementing increased dial-a-ride service as warranted need to be developed.
- Marketing strategies for dial-a-ride service need to be developed.
- Additional park-and-ride lot sites need to be identified.

Environmental Issues

- Environmental goals need to be defined for the transportation plan.
- Wildfire danger and road closures can impact travel in Greenlee County due to the limited number of overall routes available.
- All weather property accessibility is important for emergency access, but requires roads with larger footprints that impact surrounding environment.
- Access to development in rural and remote locations may conflict with environmental goals.
- A larger foot print by improved or new roads may impact the environment.

Funding Issues

- The County needs a method to identify and prioritize projects in order to seek funding.
- The County, Town of Clifton, and Town of Duncan need to seek opportunities, adopt plans, and aggressively pursue alternative funding sources.

Economic Issues

- Improvement in mobility could improve economic development.
- Transit service is needed to improve mobility.
- Excursion train from Duncan to Clifton might spur tourism.

Constraints

Environmental issues, including environmental sensitivity, topography, and cultural resources, must be addressed when developing the transportation plan and improvement program. Funding is a significant constraint. This study will define funding strategies and identify funding sources in order for the County to aggressively pursue revenue. In addition, transportation improvements must be prioritized in order to maximize benefits from individual projects within the limited revenue sources.

Recommendations of 2003 Greenlee County Comprehensive Plan

The 2003 Greenlee County Comprehensive Plan process identified various transportation issues to be addressed and developed the following recommendations in regard to the county's transportation system.

State Highways

- Bring all roads up to current standards.
- Continue an aggressive maintenance program with a particular emphasis on ride quality.
- Continue marketing efforts for U.S. 70, the "Old West Highway."
- Move U.S. 191 away from the Morenci Mine.
- Extend AZ 75 to I-10.
- Construct bypasses to avoid the San Francisco River and Gila River floodplains.

County Roads

- Develop a road right-of-way inventory.
- Prove ownership of significant right-of-ways.
- Consider abandoning those roads that we do not or cannot maintain.
- Encourage property owners to develop access ways to property and to petition the County for inclusion of access ways into the County's Road System.
- Continue maintenance on those roads already being maintained.

Other Access Ways

- Develop an inventory of access ways.
- Work to make these ways part of road or trail systems.
- Encourage responsible use of roads.

Railroads

- Provide track roadway grade separations for train crossings, particularly in Clifton.
- Continue to support the primary use of the railroad for freight.
- Consider a scenic railroad use.

Transit

- Maintain bus service.
- Continue transportation for the elderly.
- Encourage private transit, including taxi service for residents.

Bicycle and Pathways

- Develop opportunities to increase bicycling, both on highways and on trails, within the county.
- Connect trails and other routes.
- Coordinate efforts with the Department of Transportation to make state highways "friendly" for cyclists.
- Develop trails, or pedestrian paths, along State Highways and "developed" ways.

Airports

- Encourage regularly scheduled airline service.

FUTURE SOCIOECONOMIC AND TRANSPORTATION CONDITIONS

Future Population

Table 28 shows the DES population projections for Greenlee County. The County is projected to lose population through 2020 and then begin to slightly regain population. However, members of the Technical Advisory Committee (TAC) dispute the DES projected numbers and believe that there has been steady growth in southern Greenlee County and that this growth will continue.

TABLE 28. POPULATION ESTIMATES - GREENLEE COUNTY

Year	Population	% Change
2005	8,300	
2006	8,281	-0.23%
2010	8,209	-0.87%
2015	8,188	-0.26%
2020	8,189	0.01%
2025	8,205	0.20%
2030	8,289	1.02%

Source: DES March 31, 2006

Future Traffic Volumes

Table 29 presents the daily traffic volumes for county and local roads for the years 2011, 2016, and 2026 based on locations where previous traffic counts were taken. Table 30 gives future daily traffic volumes on state highways within the study area. Figure 14 presents the 2026 future traffic volumes for the roads in the study area.

Future roadway needs

As part of the *Year 2004 Roadway Needs Study Update* conducted by the Arizona Association of County Engineers, Greenlee County identified county road deficiencies. The 2005 to 2010 county roadway deficiencies are shown in Table 31. A total of \$4,569,517 is needed for right-of-way acquisition, minor widening, and reconstruction for this five-year period.

**TABLE 29. ESTIMATED FUTURE DAILY TRAFFIC VOLUMES
COUNTY AND LOCAL ROADS IN STUDY AREA**

Location	2011	2016	2026
Carroll Loop 0.2 mi. South of Highway 75	110	120	140
Fairgrounds Rd. 0.5 mi. North of Highway. 75	270	295	344
Franklin Road Btwn. McGrath & Model	391	426	497
Old Virden Road Btwn. Highway 75 & Clesa R	119	130	152
Park Ave. 0.1 mi. North of Coronado Blvd.	357	390	455
Rocky John Loop 0.1 mi. West of Highway 75	112	122	142
Sheldon Loop 0.1 mi. North of Sheldon Swinging	137	149	174
Skyline View 0.2 mi. North of Highway 191	976	1,065	1,243
Stephens Loop 0.1 mi. West of Highway 75	55	60	70
Virden Road S/O Btwn. Clesa & Luntville	272	297	346
Wards Canyon Road East of Highway 191	1,036	1,130	1,318
7th Street North of US 191	420	458	535
Chase Creek Street West of US 191	363	396	462
Riverside Road South of US 191	401	438	511

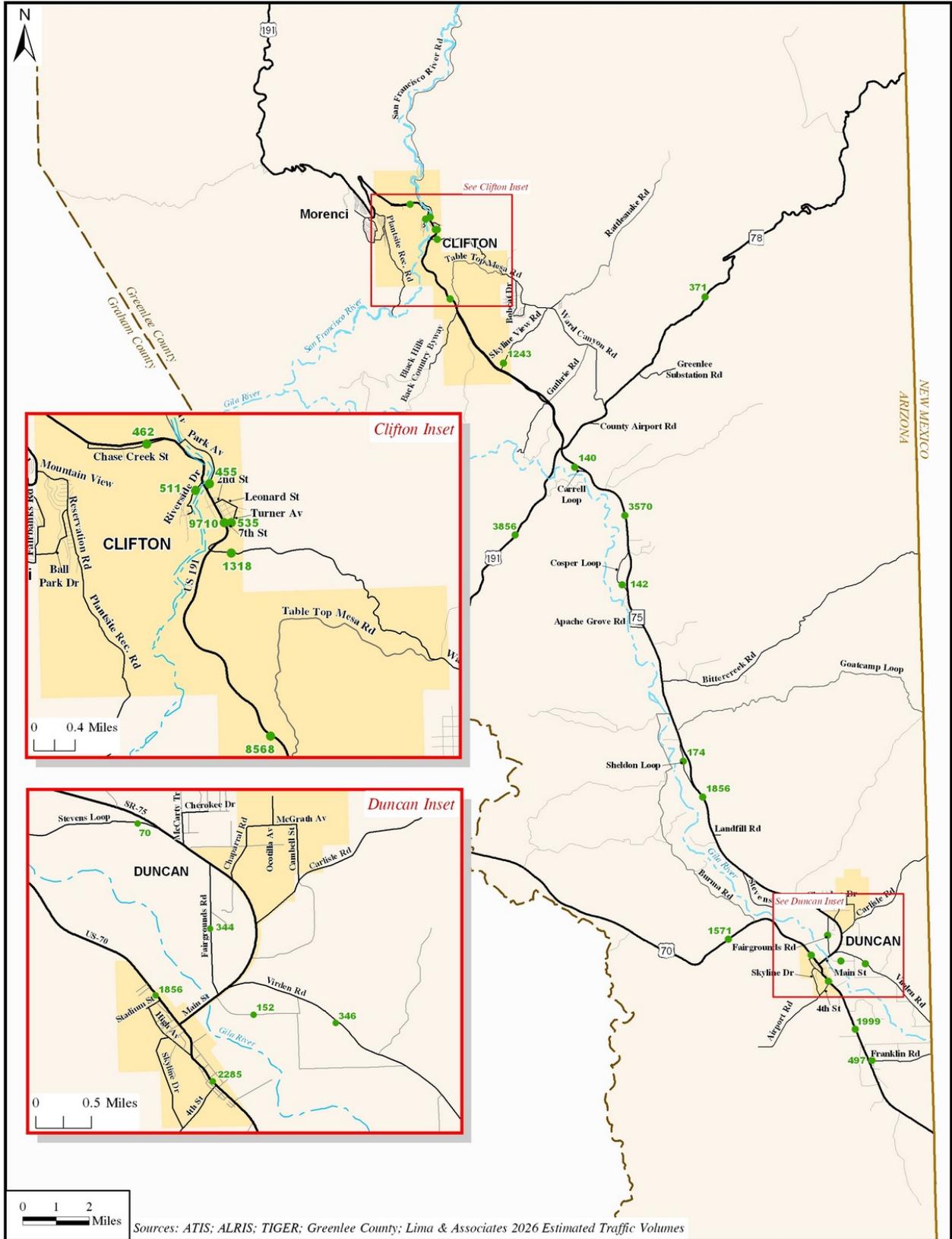
Source: Lima & Associates

**TABLE 30. ESTIMATED FUTURE DAILY TRAFFIC VOLUMES
ARIZONA STATE HIGHWAYS IN STUDY AREA**

Route	Bmp	Start	Emp	End	2011	2016	2026
US 70	349.48	US-191 (North)	378.48	Wilson St	1,234	1,346	1,571
US 70	378.48	Wilson St	378.91	SR-75 (Duncan)	1,459	1,591	1,856
US 70	378.91	SR-75 (Duncan)	379.79	7th St	1,795	1,958	2,285
US 70	379.79	7th St	385.25	New Mexico State Line	1,571	1,714	1,999
SR 75	379.46	Virden Rd	391.85	Apache Grove Rd	1,459	1,591	1,856
SR 75	391.85	Apache Grove Rd	398.43	US-191 / SR-78	2,805	3,060	3,570
SR 78	154.55	(South of Clifton)	174.73	New Mexico State SR-78/SR-75 Line	292	318	371
US 191	130.64	US-70 (E of Safford)	154.52	(Guthrie)	3,029	3,305	3,856
US 191	154.52	(Guthrie)	163.07	7th St	6,732	7,344	8,568
US 191	163.07	7th St	163.95	UX-191	7,630	8,323	9,710

Source: Lima & Associates

**FIGURE 14. 2026 AVERAGE DAILY TRAFFIC VOLUMES
SOUTHERN GREENLEE COUNTY**



**TABLE 31. ANALYSIS OF ROADWAY DEFICINCIES 2005-2010
SOUTHERN GREENLEE COUNTY**

Improvement Type: 1 Right-of-Way Acquisition					
On Street	From	To Reference	Length	Total Cost	Comment
County Club Road	SR 75 - 394.3 E	End Pvmnt	0.70	\$4,327	Fails Right-of-Way Width
Franklin Road	U.S. 70 - 382.1 E	N.M. State Line	2.00	\$74,170	Fails Right-of-Way Width
			Improvement	\$78,496	
Improvement Type: 2 Minor Widening					
On Street	From	To Reference	Length	Total Cost	Comment
Apache Grove Road	SR 75 - 391.8 W	End	0.30	\$12,544	Fails Roadway Width, Right-of-Way Width
Billingsly Loop	SR 75 - 379.4 E	67027 S	1.40	\$49,884	Fails Roadway Width
Billingsly Loop	SR 75 - 379.4 E	67027 S	1.40	\$62,354	Fails Roadway Width
Carlisle Road	SR 75 - 380.1 E	N.M. State Line	3.80	\$169,248	Fails Roadway Width
Carlisle Road	SR 75 - 380.1 E	N.M. State Line	3.80	\$135,398	Fails Roadway Width
Clesa Drive	67002 S	67002 - S	1.40	\$85,175	Fails Roadway Width, Right-of-Way Width
Dairy Street	67002S	67006 End	0.70	\$50,901	Fails Roadway Width, Right-of-Way Width
Hails Road	SR 75 - 385.0 W	End	1.00	\$49,172	Fails Roadway Width, Right-of-Way Width
Lower Eagle Road	U.S. 191 - 171.6 W	Eagle Creek	5.90	\$395,229	Fails Roadway Width, Right-of-Way Width
Luntville Road	67002 S	67007 End	0.40	\$29,086	Fails Roadway Width, Right-of-Way Width
Old Virden Road	SR 75 - 379.3 E	67008	0.90	\$54,755	Fails Roadway Width, Right-of-Way Width
Upper Eagle Road	U.S. 191 - 187.2 W	End - Honeymoon	22.80	\$1,421,682	Fails Roadway Width
Wilbur Lunt Road	67002 S	67002 S	0.80	\$58,173	Fails Roadway Width, Right-of-Way Width
			Improvement	\$2,573,600	
Improvement Type: 3 Reconstruct to the Correct Surface Type					
On Street	From	To Reference	Length	Total Cost	Comment
Calle Alta Vista	67099A	67099A (E)	0.30	\$89,150	Fails Surface Type, Right-of-Way Width
Plantsite Rec. Road	Reservation Morenci	Railroad Tracks	1.30	\$693,419	Fails Surface Type, Roadway Width, Right-of-Way Width
Skyline View Road	U.S. 191 - 157.2(E)	67003	2.40	\$783,172	Fails Surface Type, Roadway Width
Skyline View Road	67003	67099A	0.30	\$87,296	Fails Surface Type, Roadway Width
Wards Canyon Road	U.S. 191 MP 162.8 - E	Skyline View Road	0.50	\$264,383	Fails Surface Type, Roadway Width
			Improvement	\$1,917,421	
			County	\$4,569,517	

Source: Year 2004 Roadway Needs Study Update. Arizona Association of County Engineers

4. MULTIMODAL TRANSPORTATION PLAN

EVALUATION OF DEFICIENCIES AND NEEDS

County Roadways

During the conduct of the Small Area Transportation Study, the consultant team made the following observations regarding existing deficiencies and needs in the County transportation system:

- With the exception of urban areas and State Highway segments, no significant traffic congestion or level of service issues exist on roadways within the County in 2006.
- The mobility of Southern Greenlee County residents is dependent upon the maintenance and improvement of the US and State Highways that traverse the County and function as “spines” that tie the County roadway network together.
- In many areas of the County, alternative routes are inconvenient or non-existent. This could cause problems when the main route is closed due to a traffic crash or natural causes such as high water, floods, or wildfires. Specific areas of concern are:
 - ✓ Congestion on US 191 within the Town of Clifton during peak Morenci Mine employee shift-change periods
 - ✓ Lack of alternate routes for use in case of traffic congestion, floods, or wildfires, particularly within the Town of Clifton and along the SR 75 corridor between Clifton and Duncan
- The County Public Works Department is well-informed regarding the deficiencies and needs of the roadway system and programs maintenance, improvement, or reconstruction projects as funding permits.
- All of the subgroups living within the County will benefit from the roadway projects already programmed by the County, as well as additional projects proposed in this Report.
- Continued levels of mobility for County residents and visitors are almost entirely dependent on private automobile travel, the maintenance of good roads, and the availability of affordable gasoline.

Bicycle, Pedestrian, and Equestrian

The scenic beauty and comparatively mild climate of Southern Greenlee County are very conducive to outdoor activities including bicycling, hiking, and horseback riding. The Apache Sitgreaves National Forest, which begins in the northern part of the study area and extends northward, has a number of hiking and equestrian trails, several of which are located in the study area.

A number of recreation areas and activity centers are identified in the non-Forest parts of the study area, including locations on private lands and State Trust lands. The eastern portion of the Gila Box Riparian Area is located in the study area, and the Black Hills Back Country Byway bisects the southwestern portion of the study area. Other than the Back Country Byway, few trails are specifically identified within the study area for bicycle, pedestrian, or equestrian use. For purposes of both safety and recreation, trails need to be provided outside the National Forest.

Multiuse Pathways

Multiuse Pathways are needed in urban and suburban areas. The York Valley Walkway needs to be completed and ultimately extended to three miles in length as originally planned. The Sandra Day O'Connor Walkway needs to be completed in the Duncan area. As population and development increase, portions of the rural trail system may need to be brought up to multiuse pathway standards and additional alignments for both pathways and trails identified. Preservation of connectivity among the trails and accessibility to the trails from the urban areas is important.

Aviation

The identification of aviation needs and services, per se, is beyond the scope of this project. However, the roadway access to the Greenlee County Airport is adequate for the current low volume of activity at the airport. Airport activity could increase dramatically due to the introduction of commercial air service or the establishment of some other traffic-generating activity on the airport property such as the proposed satellite prison operation or aviation training. The increased traffic may necessitate improvements to the airport access road itself, the entrance to the airport from SR 78, or possibly the nearby SR 75, SR 78, US 191 intersection at Three Way.

Proposed airside improvements to the O'Connor Field facility in Duncan would need to be accompanied by improvements to the roadways serving the airfield.

Public Transportation

- Intercity transit services provided by Greyhound Lines along the US 70 corridor through Duncan have ceased. No alternative transportation is provided.
- No scheduled public transportation exists between Duncan, the County's second largest concentration of population, and Clifton, the County seat.
- The County, together with Graham County, the City of Safford, the Towns of Clifton and Duncan, ADOT, the Southeast Arizona Association of Governments (SEAGO), and the Southeast Arizona Community Action Program (SEACAP), needs to

implement “Arizona Rides” concepts for ensuring the efficient use of special needs transportation vehicles and operating personnel among the agencies and organizations responsible for seeing to the needs of the clients of these services.

Excursion Rail

The consultant believes that the potential may exist to develop an excursion passenger train operation on the rail line between Clifton and Duncan. The route is scenic, and the beautifully-restored Clifton Depot is a potential asset to such an operation.

Special needs transportation and future excursion rail services are discussed in more detail in Chapter 5.

CANDIDATE TRANSPORTATION PROJECT CRITERIA

Candidate projects were identified by considering the need and the feasibility of implementation. The following criteria were evaluated:

Need

- Potential to address travel demand
- Potential to serve residents
- Potential to provide connectivity and/or improve mobility between places and major roads

Feasibility

- Environmental and physical impacts
- Topographical constraints
- Constructability

ROADWAY PROJECTS

The consultant reviewed key characteristics of the existing roadway system including the surface type of the roadway, the number of lanes, and the AADT. Study area roadway projects that were identified by previous studies or have already been programmed were also evaluated. These programmed roadway projects are depicted in Figure 15. The sufficiency ratings of County and local bridge structures in the study area were also reviewed.

Functional Classification and Level of Service

Roadway Level of Service is a measurement of how well a roadway operates. An LOS of “A” indicates a free flow condition and an LOS of “F” indicates forced traffic flow or breakdown. No capacity problems exist on County-maintained roadways. The only capacity concerns within the study area exist on US 191. As Figures 16A and 16B show, US 191 has two areas with an LOS of “C”—one within the Town of Clifton and one just north of the

FIGURE 15. PROGRAMMED ROADWAY IMPROVEMENTS

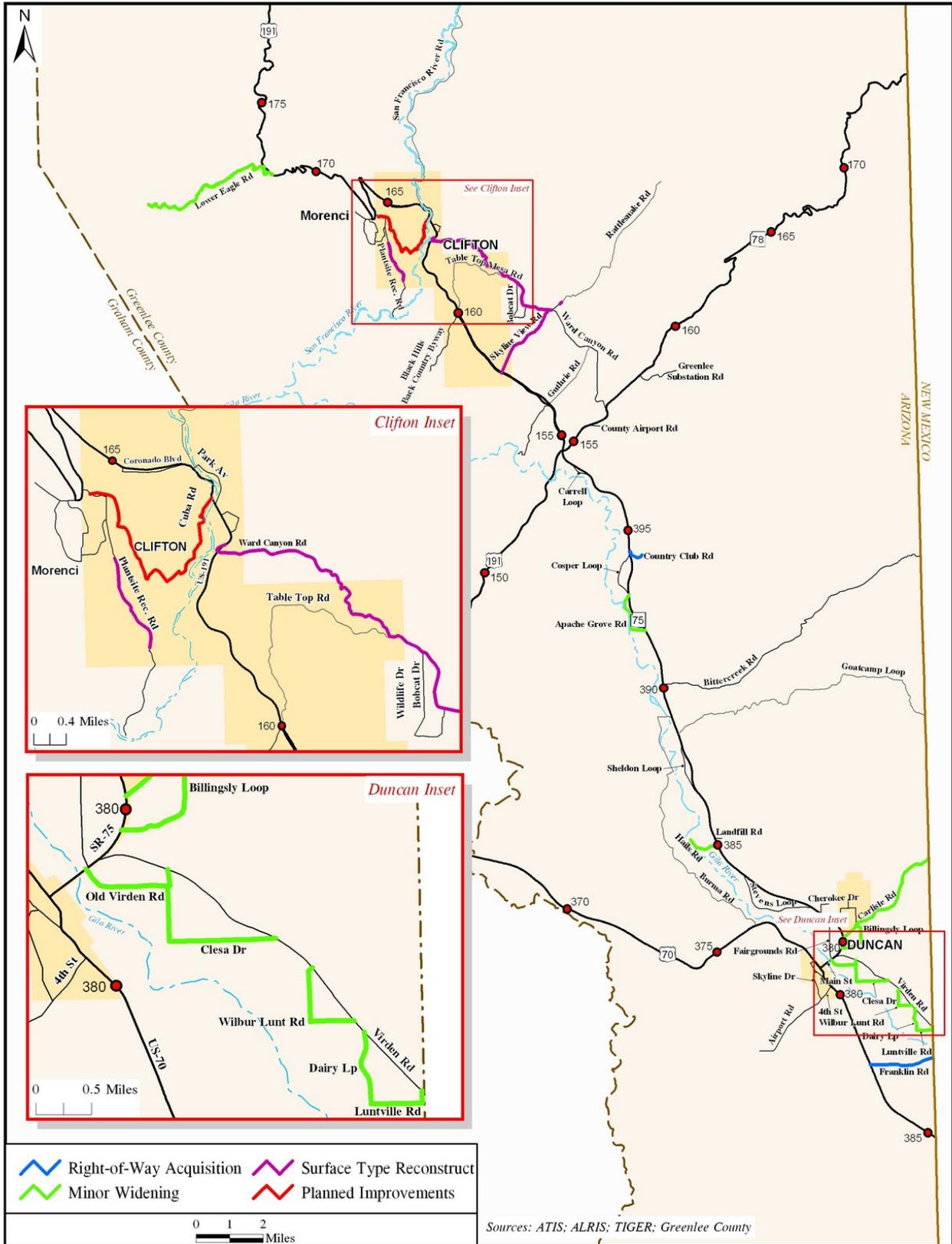
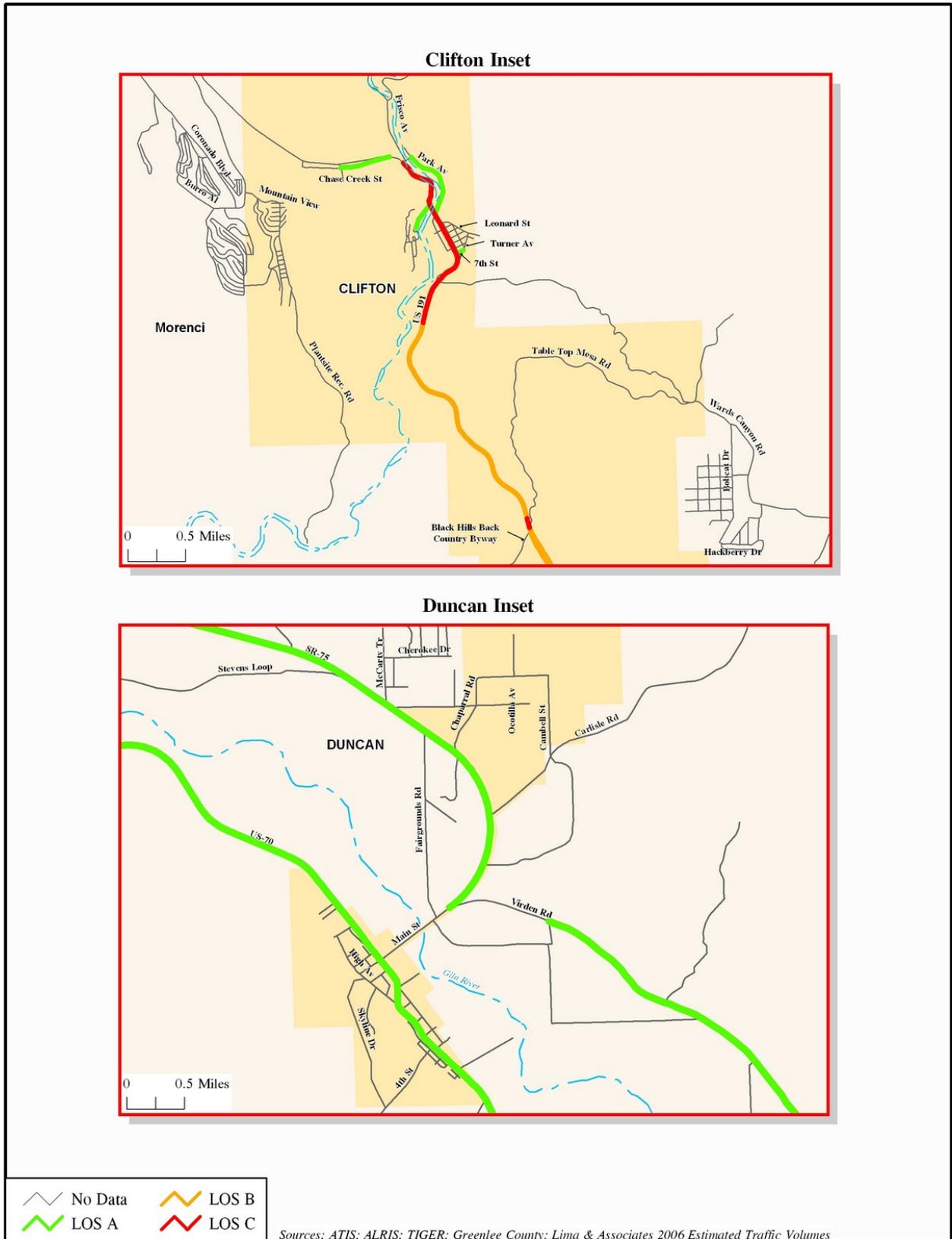


FIGURE 16A. 2006 ROADWAY LEVEL OF SERVICE



**FIGURE 16B. 2006 ROADWAY LEVEL OF SERVICE
DETAILS OF CLIFTON AND DUNCAN AREAS**



Three Way junction. The remainder of US 191 between the Three Way area and Clifton operates at LOS “B.” All other roadways within the study area are at LOS “A.” With the exception of the segment of US 191 beginning at Three Way and extending through Clifton, no future capacity issues are anticipated on roads in the study area.

Improvements to Existing Roadways

The consultant reviewed the existing roadway alignments in the study area and identified key future roadway corridors for construction or improvement as warranted by future population growth and development. First, activity centers that serve as attractors or generators of motor vehicle traffic were identified. Figure 17A shows activity centers throughout the Study Area and Figure 17B shows details of the Clifton and Duncan areas. Next, current and future roadway corridors that serve—or could serve—these activity centers were identified. Figure 18 depicts the corridors. Table 32 lists the improvements keyed to the map reference letter included on Figure 18. Along existing roadways, including US 191, US 70, SR 75 and SR 78, efforts should be made to preserve rights-of-way as needed for possible widening and addition of elements such as deceleration and right-turn lanes, center medians, and left-turn lanes.

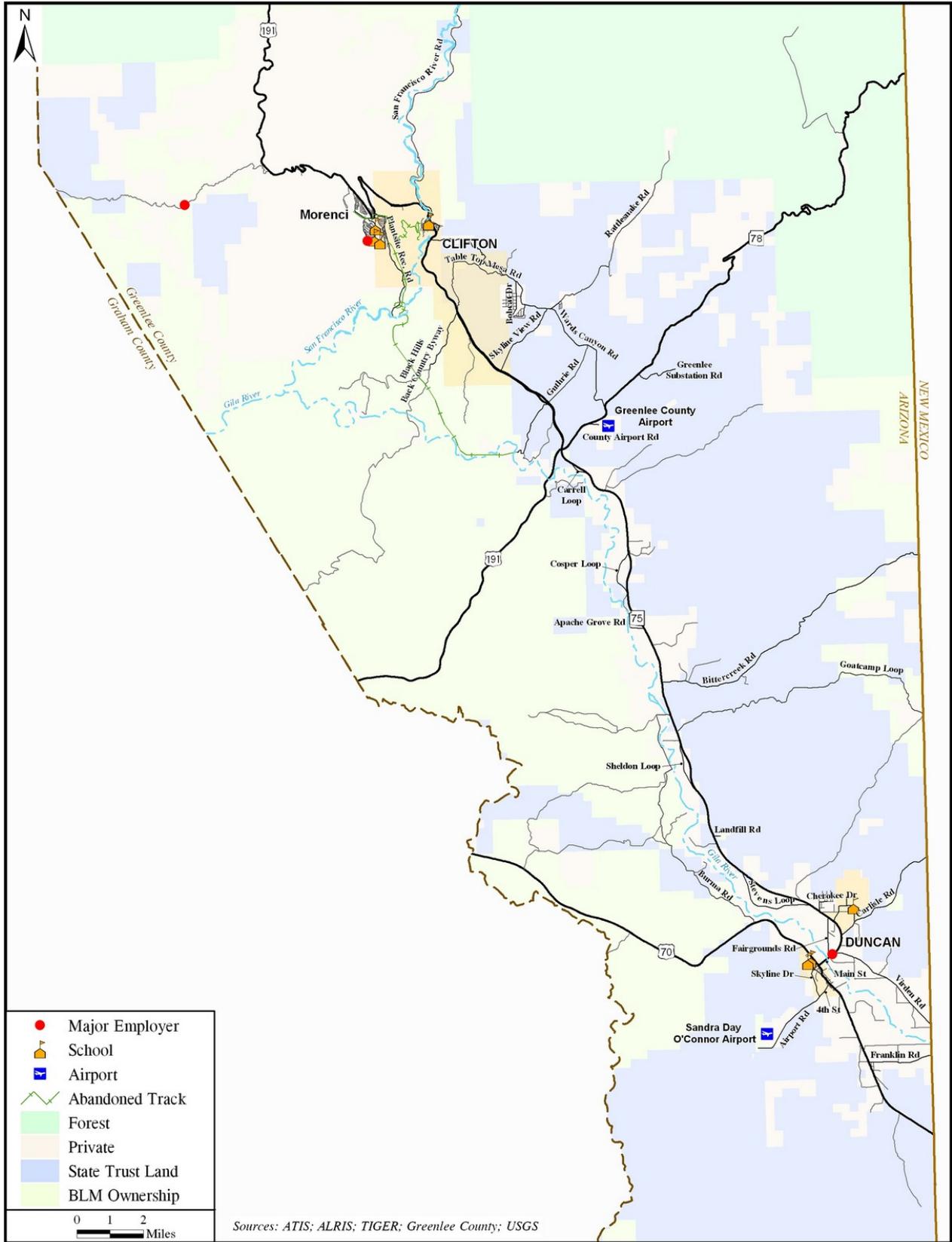
Other existing alignments are identified that could become roads of regional significance as area population grows over time. These include Ward Canyon Road, Table Top Mesa Road, San Francisco River Road, Rattlesnake Road, Guthrie Road, Bittercreek Road, Burma Road, and Virden Road. Sufficient rights-of-way should be preserved in these and other alignments to allow for reconstruction to correct deficient geometrics, paving, and ultimate widening as needed.

In the York Valley area, Cospers Loop on the West side of SR 75 needs to be reconstructed and widened. In addition, the multiuse pathway on the East side of SR 75 needs to be improved and extended. Ideally, when the SR 75 bridge across Cottonwood Wash is rehabilitated or replaced, room for the pathway as a striped lane or sidewalk on the East side of the bridge should be provided so that the pathway can continue beyond Cottonwood Wash.

Additional Roadway Alignments

In addition to existing alignments, additional alignments have been identified that could be developed into future roadways as warranted. As area population and development increase, the provision of alternate routes for use to avoid or alleviate traffic congestion, as well as emergency use in case of floods or wildfires, will become more critical. The objective of the consultant was to initiate thinking in terms of identifying and preserving rights-of-way for a matrix of interconnecting roadways for future mobility. Future studies will identify specific alignments, conduct the engineering and design, and develop cost estimates.

FIGURE 17A. SOUTHERN GREENLEE COUNTY ACTIVITY CENTERS



**FIGURE 17B. SOUTHERN GREENLEE COUNTY ACTIVITY CENTERS
DETAILS OF CLIFTON AND DUNCAN AREAS**

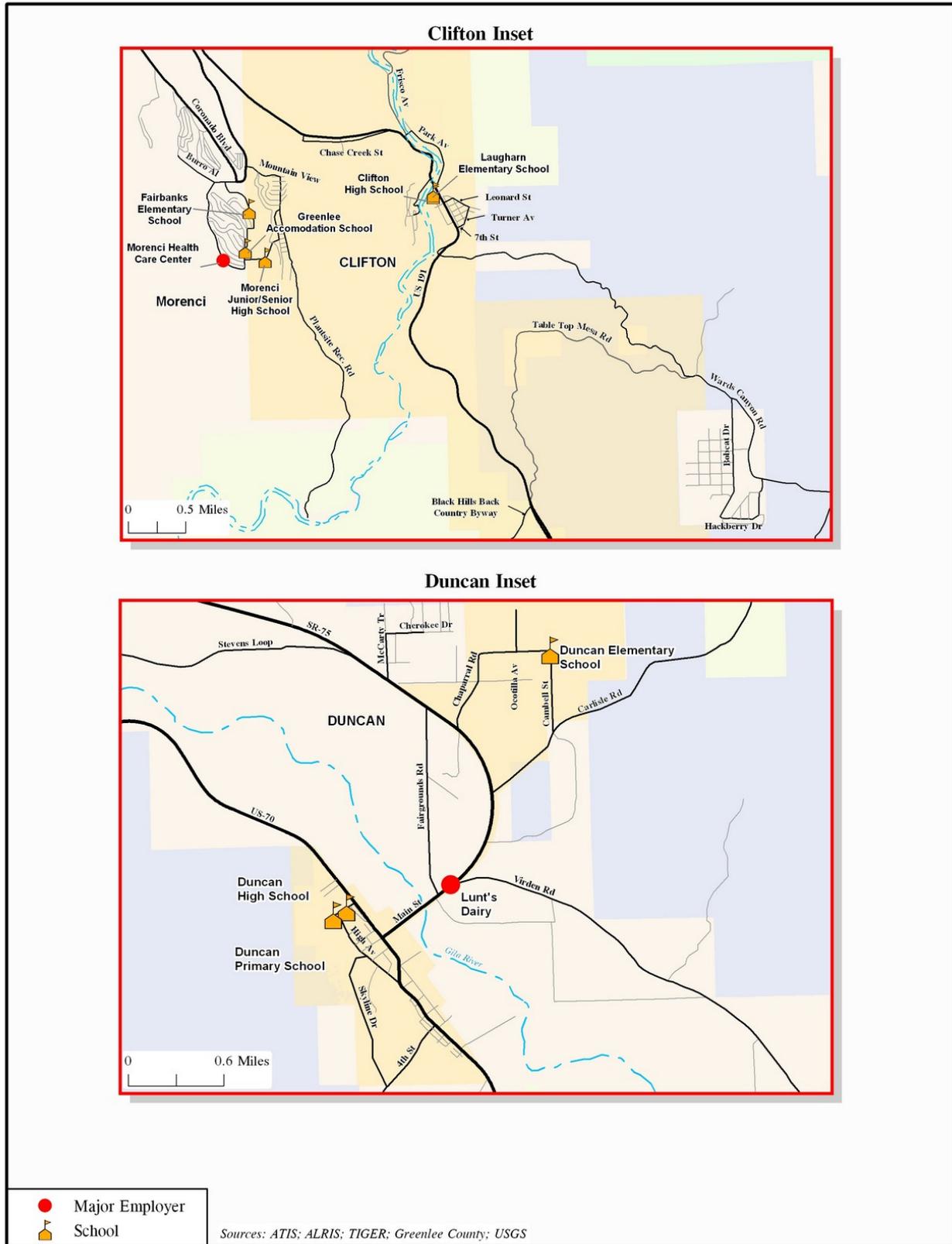
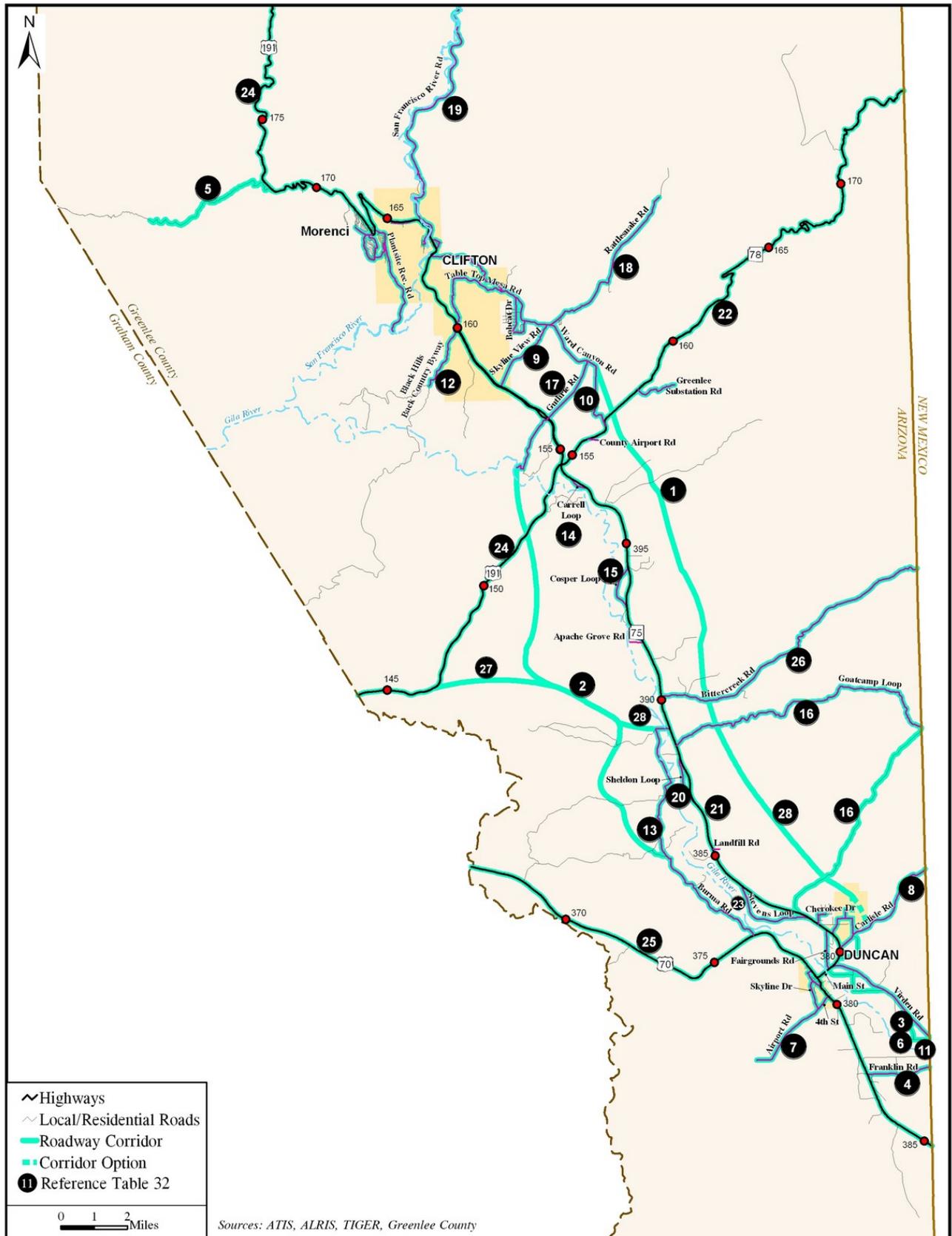


FIGURE 18. CURRENT AND FUTURE ROADWAY CORRIDORS



**TABLE 32. CANDIDATE ROADWAY IMPROVEMENTS
FOR SOUTHERN GREENLEE COUNTY**

Map Reference	Roadway or Corridor	Project Description
1	SR-78 – Goatcamp Loop	Study new roadway parallel to SR 75 as extension of Wards Canyon Road alignment
2		Study connecting roadway
3	Dairy Loop*	Minor widening
4	Franklin Road*	Right-of-way acquisition
5	Lower Eagle Road*	Minor widening
6	Luntville Road*	Minor widening
7	Airport Road	Reconstruct and Pave
8	Carlisle Road	Reconstruct and Pave
9	Skyline View Road*	Reconstruct and Pave
10	Ward Canyon Road*	Reconstruct and Pave
11	Wilbur Lunt Road*	Minor widening
12	Black Hills Back Country Byway	Preserve right-of-way for future improvements for two miles west of US 191
13	Burma Road	Reconstruct and Widen
14	Carrell Loop	Reconstruct and Widen
15	York Area	Reconstruct and Widen Cospers Loop; Study Access Management; Improve and extend multiuse pathway on East side of SR 75
16	Goatcamp Loop	Reconstruct and Widen
17	Guthrie Road	Reconstruct and Pave
18	Rattlesnake Road	Reconstruct and Pave
19	San Francisco River Road	Reconstruct and Pave
20	Sheldon Loop	Reconstruct and Widen
21	SR 75	Preserve right-of-way for future improvements
22	SR 78	Preserve right-of-way for future improvements
23	Stevens Loop	Reconstruct and Widen
24	US 191	Preserve right-of-way for future improvements
25	US 70	Preserve right-of-way for future improvements
26	Bitter Creek Road	Reconstruct and Widen
27		Study connecting roadway
28		Study connecting roadway

* Previously Planned or Programmed Projects
Source: Greenlee County, Lima & Associates

The consultant suggests a new candidate alignment that would parallel SR 75 to the east. This alignment would begin in the Clifton area as a southern extension of Ward Canyon Road and extend southeasterly toward Duncan following the existing pipeline or power line utility corridor. The alignment would cross Bitter Creek Road and both legs of the Goatcamp Loop and enter the Duncan area on either the Campbell Road alignment or an alignment east of Campbell that would tie into Carlisle Road.

Other new candidate alignments would:

- Extend Guthrie Road to intersect US 191 and then parallel SR 75 to the west, ultimately tying into Burma Road in the Sheldon area.
- Add a link from US 191 just east of the County line over to the new Guthrie Road extension

In the Clifton area, the consultant suggests a connection from a point on Table Top Mesa Road to a point on US 191. This connection would serve Morenci Mine commuters and other motorists driving from points south and east of Clifton to Morenci and beyond.

In the Town of Duncan, the consultant suggests that the area of Church Avenue (SR 75) east of US 70 where Fairgrounds Road and Old Virden Road tie into Church Avenue be studied to identify ways in which these roadways might be realigned to develop a functional four-way intersection. This intersection would anchor the southwest corner of the new subdivision being developed in the semi-circular acreage bounded by Fairgrounds Road and SR 75.

IMPROVEMENTS AND ADDITIONS TO TRAIL SYSTEM

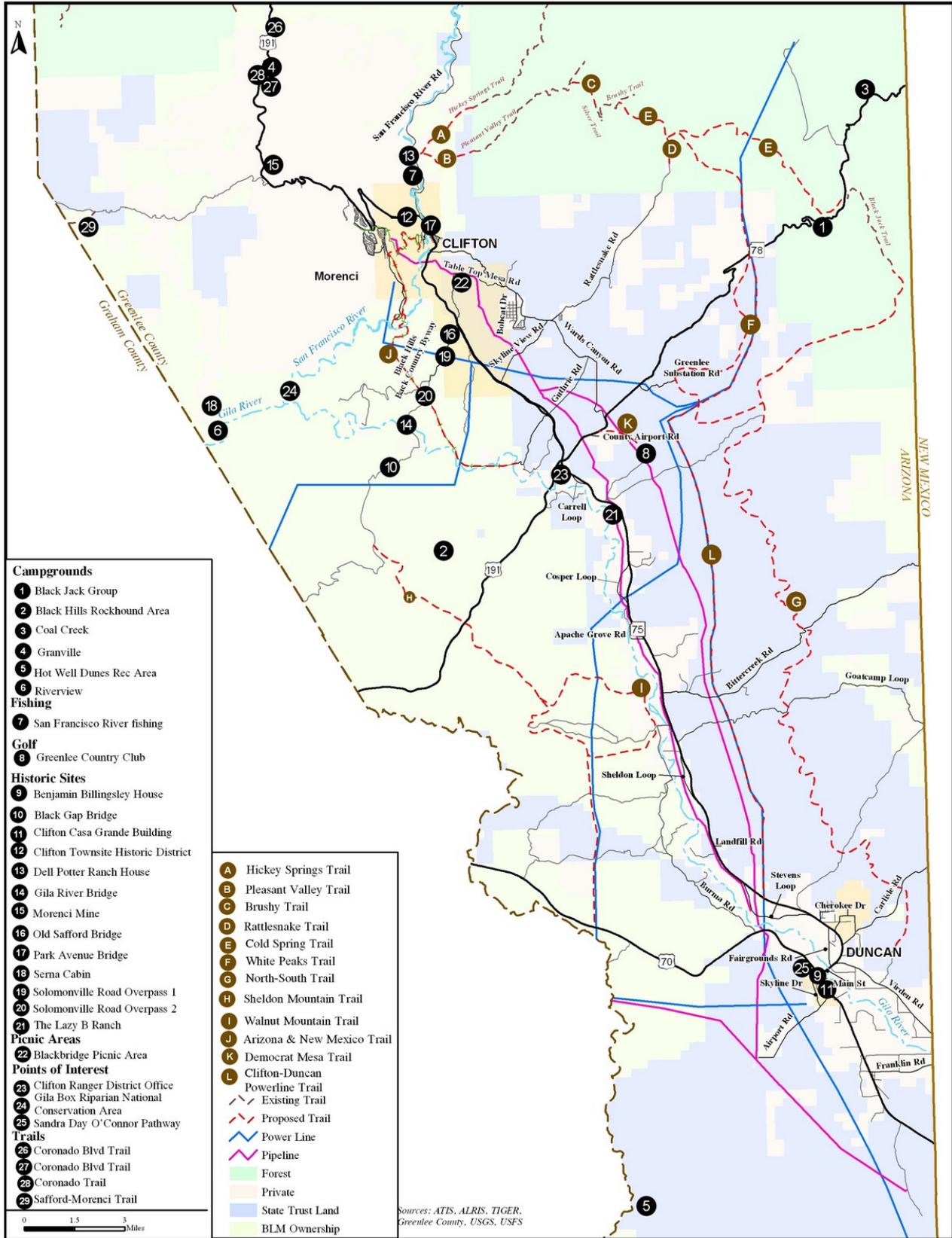
The consultant identified a number of opportunities within the study area for adding trails for pedestrian, equestrian, or bicycle use. First, key recreation areas within the study area were identified. The locations of existing trails in the National Forest in the northeast corner of the study area were identified, and several trail alignments were suggested by connecting these existing Forest trails with potential trailhead sites accessible by area roadways. Other trail alignments were suggested by the locations of abandoned railroad rights-of-way, utility alignments, and activity centers. Figure 19 depicts the recreation areas and suggested additions to the trail system. Table 33 lists the suggested trails, including a map reference letter included on Figure 19. Note that some alignments such as utility corridors could also be developed as either roads or trails—or in some cases—both, with parallel roadway and trail facilities.

Not all the suggested trail alignments are likely to be practical to implement. Some traverse privately held land, and Arizona landowners have a variety of attitudes toward trails crossing their properties. Some forbid any form of “trespassing” while others—including ranchers who may be trail enthusiasts themselves—simply ask that gates be kept closed to contain livestock. In areas where rural buildings or natural features are recognized as local landmarks, eventual acquisition for public use by the County, a town, or some other agency may be feasible.

Trail Planning, Design, and Construction Resources

A number of resources are available for use by local and regional agencies in planning, designing, constructing, and maintaining trails.

FIGURE 19. RECREATION AREAS AND TRAIL SYSTEM ADDITIONS



**TABLE 33. SUGGESTED ADDITIONAL TRAILS
FOR SOUTHERN GREENLEE COUNTY**

Map Reference	Name	Description
A	Hickey Springs Trail	Runs east from vicinity of Dell Potter Ranch House to join existing Hickey Springs Trail at National forest boundary
B	Pleasant Valley Trail	Runs east from vicinity of Dell Potter Ranch House to join existing Pleasant Valley Trail at National forest boundary
C	Brushy Trail	Connects Pleasant Valley Trail with existing Brushy Trail at National forest boundary
D	Rattlesnake Trail	Runs north from end of Rattlesnake Road to junction with Brushy Trail
E	Cold Spring Trail	Connects Rattlesnake Trail with Black Jack Trail near Black Jack Group
F	White Peaks Trail	Connects Rattlesnake and Cold Spring Trails with the North-South Trail east of the County airport
G	North-South Trail	Runs through the eastern portion of the County from the end of the Black Jack Trail to the Duncan area
H	Sheldon Mountain Trail	Connects the Back Country Byway with US 191 and US 70. Possible trailheads at highway crossings
I	Walnut Mountain Trail	Loop from Sheldon Mountain Trail over to west bank of Gila River
J	Arizona & New Mexico Trail	Follows old Arizona & New Mexico Railroad right-of-way from Morenci to Back Country Byway.
K	Democrat Mesa Trail	Connects County Airport with Country Club
L	Clifton-Duncan Power Line Trail	Follows existing power line alignment. Could eventually be replaced by new roadway parallel to SR 75.

Source: Greenlee County, Lima & Associates

As examples, the following documents are available from the American Association of State Highway and Transportation Officials. These documents may be ordered by writing AASHTO at 444 North Capitol St NW, Washington DC 20001, by telephone at 1-800-231-3475, or online at <https://bookstore.transportation.org/>.

- *Guide for the Development of Bicycle Facilities*, 1999 (*AASHTO Bike Guide*); \$85.00 (AASHTO members \$72)
- *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, 2004 (*AASHTO Pedestrian Guide*); \$90 (AASHTO members \$75)

In addition, *Planning, Design and Development Guidelines*, 2006, from the Minnesota Department of Natural Resources, Trails and Waterways, is a best-practices guide for both motorized and nonmotorized trails. The Document may be obtained from Minnesota's Bookstore, 660 Olive Street, St. Paul, MN 55155, by phone at 1-800-657-3757, or online at <http://www.comm.media.state.mn.us/bookstore/bookstore.asp>.

ATV Route Guideline and Suggestions (A Community Official's Handbook), produced by the Bureaus of Law Enforcement and Community Financial Assistance of the Wisconsin

Department of Natural Resources, is available online free of charge at <http://dnr.wi.gov/org/caer/cfa/lr/atv/Manual.pdf>.

Key Points in the AASHTO Bike Guide Relating to Shared-Use Paths

- Shared-use paths have exclusive rights-of-way with minimal cross-flow from motor vehicles.
- Shared-use paths are intended for a variety of users including bicyclists, skaters, skateboarders, wheelchair users, walkers, and joggers.
- Shared-use paths should be designed to complement, not substitute for, on-road pedestrian and bicycle facilities.
- When two-way shared-use paths are located immediately adjacent to highways, operational problems are likely to occur.
- Paths should be separated from highways by at least five feet of landscaping; otherwise, suitable barriers should be provided to separate the two facilities.
- A recommended paved width for a two-way shared-use path is 10 feet.
- The horizontal alignment of the path needs to reflect the bicycle design speed of the path. The faster bicyclists ride, the more steeply they lean into curves, and curve radii should be chosen that enable bicyclists to negotiate them at the desired speed without touching the inside pedals to the pavement.
- Grades on shared-use paths should be kept to a minimum. Grades steeper than 5 percent are difficult for many bicyclists to negotiate, especially over distances greater than 800 feet.
- Just as in facilities designed for motor vehicles, the design speed, grades, and curvature of the path must consider safe sight distance. The *Guide* has tables and graphs to aid in selecting appropriate sight distances.
- Providing a sidewalk for use as a shared-use path is undesirable:
 - ✓ Sidewalks are designed for pedestrian speed and maneuverability.
 - ✓ Sidewalks are usually of insufficient width to permit avoidance of conflicts between bicyclists and users who can change direction more quickly than bicyclists are able to react, such as pedestrians, skaters, and skateboarders.
 - ✓ Sidewalks are not wide enough to permit bicyclists to ride in pairs.
 - ✓ At crosswalks, motorists are not watching for bicyclists, who travel at higher speeds than pedestrians.
- Motorized and nonmotorized users should not share paths because of the inevitable conflicts due to the different speeds of the users.

Key Points in the AASHTO Pedestrian Guide

- Walking accounts for over 5 percent of total transportation trips.
- All travelers are pedestrians at some point during their trip.
- The AASHTO Green Book encourages roadway designers to provide for pedestrians:
 - ✓ “Interactions of pedestrians with traffic are a major consideration in highway planning and design”
- Safety is a key consideration—Pedestrians are the most vulnerable of all roadway users.
- Accessibility is also important—Pedestrian facilities should accommodate pedestrians of all abilities.
- According to AASHTO, “All roadways along which pedestrians are not prohibited should include an area where occasional pedestrians can safely walk:”
 - ✓ Unpaved walkway
 - ✓ Shoulders in rural areas
 - ✓ Sidewalks in urban areas
- Locations with no sidewalks are twice as likely to have vehicle-pedestrian crashes as sites with sidewalks.

Key Points in the ATV Route Guideline and Suggestions

This Guideline is intended for use by agencies located in Wisconsin, which has specific statutes and codes that govern ATV routes in that state. However, many of the basics apply universally. A complete list of the statutes and codes are provided in the appendix of the Guideline.

The *Guideline* defines an ATV Route as

...a highway or sidewalk designated for use by ATV operators by the governmental agency having jurisdiction. Routes are identified at the beginning point by a 24"X18" sign showing a white silhouette of an ATV on a green background. White directional arrows (12"X9") on a green background show the continuation of the route.

The *Guideline* defines an ATV Trail as

...a marked corridor on public property or on private lands subject to public easement or lease, designated for use by all-terrain vehicle operators by the governmental agency having jurisdiction, but excluding roadways of highways except those roadways which are not seasonally maintained for motor vehicle traffic. Trails are identified by 6"X6" signs showing a white silhouette of an ATV on a brown background.

Additional key points in the Guideline include:

- The single most important route consideration will be the safety of all ATV riders, pedestrians, bicyclist, automobile operators and others.
- The more automobiles and ATVs mix the higher the risk to each party.
- The entire engineering makeup of an all-terrain vehicle is based on the premise of off-road use. Specifically, the ATV tires dictate that the machines be used off the roadway.
- Considerations should be given to route speed limits when changes in road surfaces occur. Changing from pavement to mud, gravel, etc. or any combination thereof can create a hazardous riding situation if speeds are excessive. The ATV will handle differently on each surface.
- For safe ATV operation
 - ✓ · Headlights and tail lights must be turned on at all times
 - ✓ · Youth under 16 are required to have safety certificates
 - ✓ · All persons under 18 operating and/or riding on an ATV must wear a helmet
- Prior to creating a route, consider the amount and type of automobile traffic the road receives; the potential number of ATV riders that will use the route, ATV rider age potential, speeds that can be generated by ATVs, proper speed limits, stop signs/lights, intersections, pedestrian traffic, road surfaces (pavement, ice, mud, gravel,).
- ATVs use can bring tourism dollars to the business.

5. TRANSIT ELEMENT

This chapter presents existing multimodal conditions in Southern Greenlee County, together with an analysis of demand for public transportation in the study area. Types of vehicles and services are presented and options for future transit and multimodal services are discussed.

MULTIMODAL INVENTORY

This section presents a summary of existing public transportation services within and through Greenlee County. Included are medical and human services transportation, aviation, bus, and rail transportation. First, the transit-related characteristics of current demographic conditions are presented. Next, existing services in the County are described. A summary of findings is then presented on multimodal needs and actions that have been recommended by previous studies and plans.

Transit-Related Demographic Characteristics

Greenlee County is currently predominantly rural with a 2005 estimated countywide population of approximately 8,300 people. Figure 20 illustrates the percentages of all of Greenlee County's 2000 population that are more likely to be transit dependent: minorities, seniors, persons living below poverty, and mobility-limited persons. As shown in the figure, the percentage of minority persons is above the statewide average. However, the percentages of the other three populations are below the statewide average.

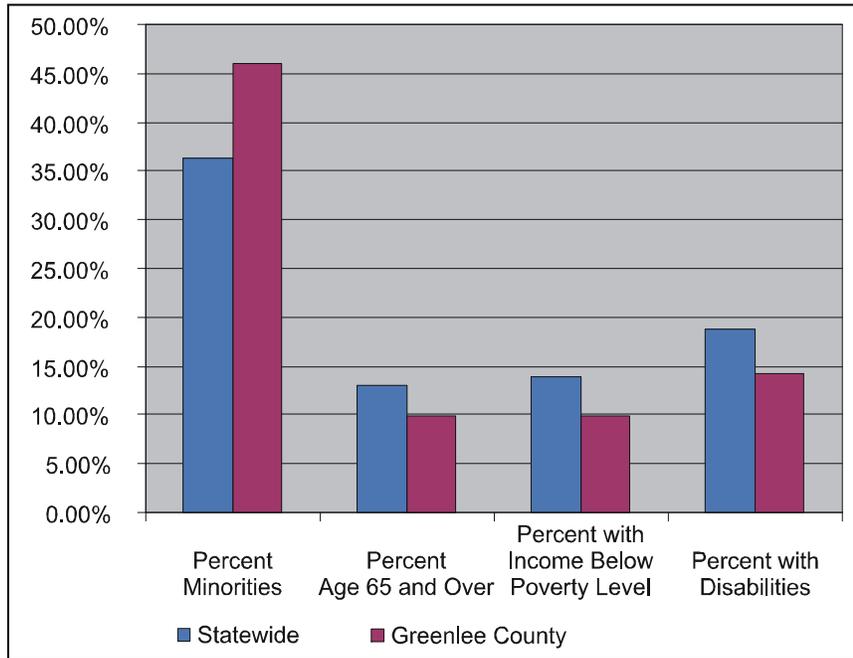
Existing alternatives to private automobile travel in Greenlee County are very limited. Hence, persons who must depend frequently on such alternatives due to limited income, age, or disability may have chosen to live in other places where public transportation is available.

Special Needs Transportation Services

Two vans within the County are used to transport seniors and mobility-limited persons. One van is based in Clifton and the other in Duncan. Acquisition of the vans was funded through a Federal Transit Administration Section 5310 grant administered by ADOT and arranged through SEAGO. Historically, the County and the City of Clifton have participated in funding the operating and maintenance expenses of the vehicles using LTAF II funds. The County has also performed routine maintenance on the vehicles, at no charge, at County maintenance facilities.

Effective in 2007, both the Clifton and the Duncan vans are now operated by a satellite office of the Safford-based SEACAP program, which is a designated Community Action Agency in Arizona, serving Greenlee and three other counties in the Southeastern portion of the State. The Greenlee County van operations are two of many Community Action programs targeted at low-income households in the service area.

FIGURE 20. STATEWIDE AND GREENLEE COUNTY PERCENTAGES OF POPULATION MORE LIKELY TO BE TRANSIT-DEPENDENT



Source: US Census 2000

The Clifton van operates locally within the Clifton-Morenci area between 8:00 am and Noon on Mondays, Tuesdays, Wednesdays, and Fridays. On Thursdays, a round trip to Safford is made for medical appointments, shopping, and other errands. The vehicle has eight seats plus one wheelchair position. The Duncan vehicle operates within the Duncan area on Mondays, Wednesdays, Thursdays, and Fridays. The medical and shopping trip to Safford is made every Tuesday and once each month a trip to Morenci is made. The Duncan vehicle also seats eight, or six plus a wheelchair. These services are intended for use by seniors. Remaining seats are made available to the public on a first come, first served basis.

Funding for replacements was approved and both vehicles replaced during 2006.

An unmet need is perceived to exist for general public transportation in the County. The vans sit idle for a portion of most days, and the County would like to be able to use one or both of the vehicles to provide service to the public. The federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, enacted in August 2005 includes a provision for offering service to the general public with such vehicles.

Gila Health Resources, a private, non-profit firm, operates an ambulance service using vehicles purchased and provided by the County. The vehicles are based at the Urgent Care Center in Morenci. Patients with medical needs that can not be addressed in Morenci are transferred to the hospital in Safford. The operation and maintenance of the ambulance vehicles is paid for by the patients or their health insurance providers.

Aviation

No commercial air service is available in Greenlee County. The closest airport with regularly scheduled airline service is Silver City, New Mexico, which has two commuter flights daily to and from Albuquerque. However, most Greenlee County residents drive to airports in El Paso, Tucson, or Phoenix, from where non-stop services to a variety of destinations are available. Table 34 lists the drive times and distances to the airports from Clifton and Duncan.

TABLE 34. DRIVE TIMES AND DISTANCES BETWEEN GREENLEE COUNTY COMMUNITIES AND COMMERCIAL AIRPORTS

Between and	El Paso International Airport		Phoenix Sky Harbor International Airport		Tucson International Airport	
	Drive Time hrs.:min.	Distance miles	Drive Time hrs.:min.	Distance miles	Drive Time hrs.:min.	Distance miles
Clifton	3:59	232	3:55	205	2:56	166
Duncan	3:20	204	3:39	201	2:40	163

Source: Mapquest, Lima & Associates

The Greenlee County Airport is a County-owned general aviation facility located approximately 8 ½ miles southeast of Clifton and 24 miles north of Duncan. No fixed base operator is located at the airport, and no fuel or repair capabilities are available. An on-site caretaker maintains the grounds and a pilot lounge with restrooms and a public telephone is provided. No ground transportation is available. The airport was last inspected by ADOT in June 1998. Table 35 lists key airport statistics. A summary of the Greenlee County Airport Master Plan, completed in June 2002, is provided in Chapter 2.

TABLE 35. GREENLEE COUNTY AIRPORT STATISTICS

Elevation above sea level	
Runway dimensions (length x width)	
Runway 7/25	4,970 X 75
Annual aircraft operations:*	
Air Taxi	4,380
General Aviation	2,190
Military	156
Total	6,726

Source: Greenlee County Airport Master Plan (2000-2020)

*Operations for 12 months ended December 31, 2000

Intercity Bus Service

In early 2005, Greyhound ceased operating over the US 70 corridor through Duncan. Since then, Greenlee County has had no intercity bus service. The closest Greyhound stops are Willcox, Arizona and Lordsburg, New Mexico. Prompted partially by the discontinuance of

service along US 70, ADOT will be conducting a Statewide Rural Transit Needs Study that will identify existing unmet needs for regional intercity transit service.

Rail Service

The Union Pacific Railroad operates a 70-mile spur between Lordsburg, New Mexico and Clifton. Approximately 41 miles of the line lie within Greenlee County. A rail map is included in a subsequent section of this chapter. The railroad operates one freight train daily in each direction. Freeport-McMoRan is the only freight customer in the County and railcars are transferred between Clifton and Morenci on the Mine's industrial railroad. Between 75 and 100 cars are carried daily. Tank car loads of acid to be used in the copper refining process are brought into Clifton, and car loads of refined copper are carried out.

The rail line is maintained to Federal Railroad Administration (FRA) Class II standards, which allow for 20 mph operation of freight trains. However, at the Clifton end of the line, trains are restricted to 10 mph because of the geometry. When the ADOT State Rail Plan was last updated in 2000, the consultant noted that the steel components of the rail line were in good to fair condition. The condition of the wooden crossties ranged from fair to poor condition. Since 2000, Union Pacific has been conducting preventive maintenance on a number of their rail lines in Arizona, including the Clifton Branch. Portions of the line follow the Gila River and have been damaged when the river flooded. The damaged areas were rebuilt and the railroad has been installing riprap to reinforce the embankments in the vicinity of the river. The rail freight operation is considered profitable.

The closest Amtrak stop is in Lordsburg, New Mexico, which is served by the *Sunset Limited* three days per week in each direction.

Multimodal Issues

- The County has a lack of alternative transportation facilities, including bicycle lanes or paths, sidewalks or trails, and public transit.
- A need exist to provide transit service linking towns and activities within the study area.
- There are potential opportunities to increase plane operations at the Clifton Morenci Airport (CFT).
- Programmed improvements for the CFT need to be completed.
- The County's Comprehensive Plan suggests that the Union Pacific rail line through the County could be considered for excursion operations.

TYPES OF TRANSIT VEHICLES AND SERVICES

The types of transit service that may be in operation in Southern Greenlee County by 2030 include dial-a-ride and paratransit services and regional commuter bus service. The regional

commuter service could be structured as either a fixed-route service or a deviated fixed route service. Vehicles typically used for these services are shown in Figure 21.

Dial-a-Ride Service is a demand-response service. Vehicles do not operate on a fixed route or schedule, but pick-up patrons at their origins and deliver them directly to their destinations. Before the trip begins, and during the course of the trip, the driver receives information from a dispatcher concerning pick-up and drop-off requests. The dispatcher and driver decide the most efficient order in which to make stops. Such a procedure often means that, after being picked up, a passenger must remain on board while “detours” to pick up or drop off other passengers are made. Hence, a dial-a-ride trip can take significantly longer to complete than if the passenger had been able to drive directly to his or her destination, and such service appeals primarily to transit-dependent persons.

Paratransit is complementary dial-a-ride service provided to seniors or disabled persons in a fixed-route service area as required by a provision of the Americans with Disabilities Act. **Reserve-a-Ride** is dial-a-ride service that requires that pick-up requests be made 24 hours in advance.

Regional Commuter Service could be operated with any of the types of vehicles shown, or with full size over-the-road coaches, as demand warrants. Commuter services typically offer several departures in the morning, timed to arrive at the employment center at the beginning of the work day, and afternoon departures scheduled at the end of the work day. Such services do not necessarily operate on weekends, but may offer weekend schedules timed to accommodate shoppers and tourists.

Fixed Route Buses operate on a route that never varies, although alternate routes may be used on Saturday or Sunday. In large urban areas, fixed route buses typically operate on headways of 60 minutes or less—with even more frequent service offered during peak travel periods. All passengers board at posted bus stops. Some of these are “time points” that appear in published timetables, but intermediate stops not listed in schedules may also be served.

Deviated Fixed Route Service, sometimes referred to as “checkpoint” service, is considered an intermediate step between dial-a-ride, which targets transit dependent riders, and fixed route service, which is more efficient in larger cities having significant volumes of transit ridership.

A deviated fixed route stops at scheduled “time points”—or “checkpoints”—much as a fixed route service does. However, the route taken between points can vary from trip to trip. This “connect-the-dots” approach offers the best of both worlds: Passengers wishing to catch the bus at the last minute can wait at a time point; at the same time, the driver can receive a pick up request from a dispatcher and “deviate” from the route accordingly. Hence, deviated fixed route trips can take longer than fixed route trips. At the same time, the service is more visible to the public than one that operates on strictly a demand-response basis.

FIGURE 21. TYPES OF TRANSIT VEHICLES

Vans similar to this vehicle operated in Pinal County are used by the Senior Centers in Clifton and Duncan to transport seniors to and from the centers as well as trips to Safford for shopping, medical, and other purposes. Future vehicles could be configured with higher roof lines to facilitate boarding and alighting of wheelchair and mobility-limited passengers.



—Lima & Associates photo



—Lima & Associates photo

This “cutaway” vehicle, comprising a minibus body constructed on a recreational vehicle chassis, is used by Valley Metro for paratransit services. However, similar vehicles are typically used in both deviated fixed route and downtown or neighborhood circulator services.

Full size motorcoaches such as this one operated by Phoenix Bus Charter are used to transport Freeport-McMoRan Morenci Mine employees between Park-and-Ride locations in Safford and the mine. Similar vehicles could be used to bring tourists from Safford, Tucson, and other communities to County attractions such as rail excursions and historic area tours.

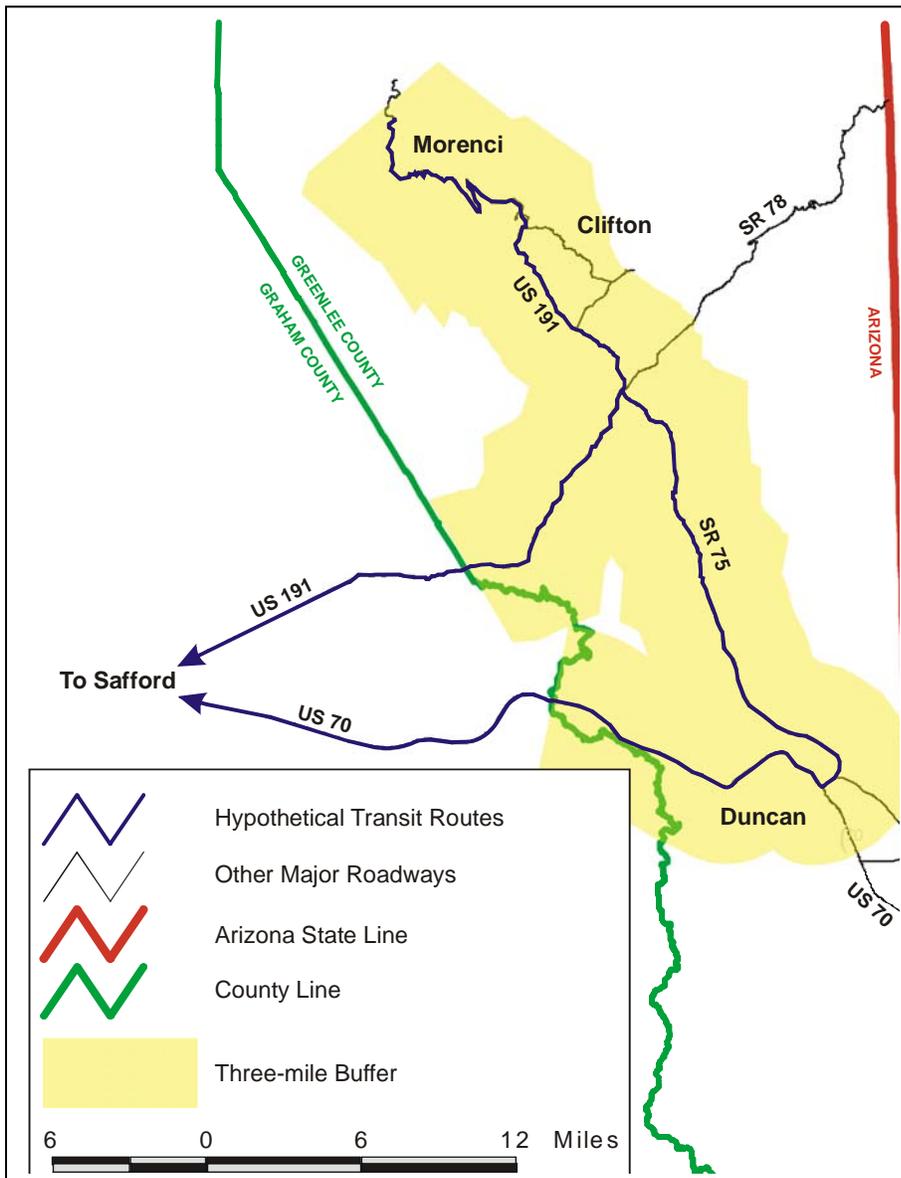


—Phoenix Bus Charter photo

ESTIMATING TRANSIT DEMAND

Estimating demand for transit in Southern Greenlee County provides a general idea of what type of services may be feasible and how many people may be expected to use a transit system. To estimate possible demand for transit service in the County, TCRP Report 3, *Workbook for Estimating Demand for Rural Passenger Transportation*, was utilized. This workbook provides a methodology for estimating transit demand for rural systems, using population data for the year of proposed service start-up and assumptions of service area size and route lengths.

FIGURE 22. HYPOTHETICAL BUS TRANSIT ROUTES



Source: Lima & Associates, Inc.

The demand methodology outlined in TCRP Report 3 required that a hypothetical system be developed for analysis purposes only. A system developed for this procedure is depicted in Figure 22. Note that the routes depicted in Figure 22 are for demand-estimating purposes only and do not necessarily represent a recommended system. Even if the methodology did not require the identification of such a hypothetical system, the sparse population of large portions of the County, including the National Forest areas, would necessitate this approach in order to obtain realistic results. To conduct the demand estimation procedure, the following assumptions were made:

- The service area for the hypothetical system is defined as a three-mile buffer on each side of the roadways served by the system.
- Every resident of the County is a potential user of the system
- The percentages of County residents aged 65 and over, having mobility limitations, or living below the poverty level will be the same in 2030 as they were in 2000
- Demand estimates are based on route mileage, service area, and population within Greenlee County only
- Providing service twice daily between Morenci, Clifton, and Safford, twice daily between Duncan and Safford, and twice daily between Morenci, Clifton, and Duncan was assumed.

Documentation of the transit demand estimating process is provided in Appendix A.

Summary of Transit Demand Estimation

The demand methodology in TCRP Report 3 includes both base and alternative methods of demand estimation. The consultant conducted both procedures to compare the results from each. The base and alternative methods of transit demand estimation resulted in daily estimates of 16 and 20 trips, respectively. Given the lack of alternative travel and the comparatively compact service area, the consultant believes that an average of 18 trips per day would be a reasonable estimate.

While 18 trips per day is not a large number, consider how such a ridership level might affect the hypothetical system shown in Figure 22. If the system were operated with vehicles having, for example, 5-passenger capacities (e.g. seating for 3 and two wheelchair positions), the total “seats per day” that would be offered would be 30, or 5 times the 6 vehicle trips. If the 18 daily riders were distributed evenly among the 6 vehicle trips, each vehicle would have three of its five seats filled.

Note that the demand procedure estimated the number of riders originating or terminating in Greenlee County only. The Safford-Duncan trips could be part of a US 70 corridor service that would be carrying passengers from Globe and Safford through to connections at Lordsburg, New Mexico with Greyhound or Amtrak. The Safford-Morenci runs could be part of a service that traveled up the Coronado Trail to Springerville, St. Johns, and the I-40 corridor; and the Clifton-Duncan runs could also extend to Lordsburg. Such services would be likely to use vehicles with capacities of more than five persons.

Hence, if the Greenlee County services were provided as part of a through system, larger vehicles would likely be used. If locally-based vehicles are used to provide service on the Clifton-Safford, Duncan- Safford, and Morenci-Clifton-Duncan routes only, they could also be used for extended dial-a-ride services when not protecting one of the schedules.

Given the comparatively small transit demand demonstrated by the demand estimation process, however, the consultant believes that the two vans currently being operated in the County may be meeting a significant percentage of this demand. For example, the van based in Duncan

transports an average of six persons per day—or about a third of the demand figure. Operating the Clifton van all day long, rather than just the morning hours, would likely satisfy a significant portion of the remaining unmet needs. The cost of owning and operating additional vehicles and providing regional service for the general public would be a significant on-going commitment for a County with a population of less than 10,000 persons. Alternatively, the County could develop a ridesharing program—discussed in a later section of this paper—and work with neighboring counties, ADOT, and other agencies to obtain reestablishment of scheduled bus service along the US 70 corridor.

Freeport-McMoRan Commuter Bus Ridership

The demand estimation procedure presented in TCRP Report No. 3 is designed for identifying unmet needs of transit-dependent persons in the study area and relies on calculations based on the numbers of elderly, mobility-limited, and low-income persons in the area. Forecasting commuter bus ridership involves the development of a sketch model based on a different set of parameters including the length of the commute, the frequency or “headway” of the service, the speed of the service compared with automobile travel, the provision of park-and-ride facilities, and the number of jobs located within walking distance of the destination of the service. Development of such a model is beyond the scope of this project. However, a brief analysis of the numbers provided by Freeport-McMoRan follows.

Freeport-McMoRan was unable to provide the consultant with the exact numbers of Mine employees living in the Safford area served by the current commuter bus service. The “ball park” raw numbers provided—between 800 and 1,200 Mine employees living in Safford and an average of 35 riders on each bus—suggest that between 6 and 9 percent of the employees living in Safford use the bus. This is a remarkably high percentage but makes sense when the following are taken into consideration:

- Frequency of operation is not an issue because the buses are intentionally timed to coordinate with Mine shift changes
- Park-and-ride lots are provided
- Buses travel at automobile-competitive speeds and deliver riders directly to their place of employment
- Dedicated service is provided free of charge to riders

Additional frequencies being contemplated by Freeport-McMoRan are likely to result in increased patronage of the service. Mine-operated buses may be used by mine employees only.

Freeport-McMoRan Employee Survey

The consultant developed a draft of a survey form for use in obtaining information from Morenci Mine employees regarding their commute habits and preferences. The draft form

was submitted to Freeport-McMoRan through the firm's representative on the SATS Technical Advisory Committee, who passed it along to their Human Relations Department. Freeport-McMoRan liked the format of the draft and agreed that they themselves would like to have the information that would be gathered by conducting the survey. However, due to the unprecedented World-wide demand for copper and the need to complete capital projects before the end of 2006, the Mine says it is unlikely that the survey issue would be pursued before sometime in 2007. The draft document is provided in Appendix B.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management consists of a wide range of programs and services that enable people to get around without driving alone. Included are alternative transportation modes such as carpooling, vanpooling, transit, bicycling, and walking, as well as programs that alleviate traffic and parking problems such as telecommuting, variable work hours, and parking management.

Transportation Demand Management can address the needs of those traveling long distances with rideshare options such as vanpools and carpools. These types of services are vital in moving people around large areas, whether for work or for traveling to regional centers that have special services, medical facilities, or retail stores.

Rideshare Matching Programs provide service by identifying people who live and work close to each other and then facilitate carpooling and vanpooling. Matching services can pair full-time partners, or simply someone to call in an emergency. Rideshare matching can be done by individual employers or on a community-wide basis. In addition to commute trips, travelers can be matched with others participating in the same extracurricular school function, medical-related trip, shopping trip, or community activity.

Rideshare matching is typically done through a computerized system. A variety of vendors have created inexpensive, effective software that makes this process easy to use. Rideshare services can also be offered on-line. A sample rideshare application is provided in Appendix C.

Two common forms of ridesharing are carpools and vanpools.

Carpool participation is higher than the national average in rural Arizona, suggesting that a potential for developing additional carpools in the area exists. Strategies for formalizing and increasing carpooling in Greenlee County follow:

- The carpooling that is already established needs to be quantified and documented. This process could be an employer-based registration system that provides an incentive for filling out an information/registration card. Incentives might be as simple as a chance to be entered in a drawing for dinner for two at a popular restaurant. Periodic updates and opportunities for future carpooling incentives would be an option for carpools.

- A benefit of registering carpools is that the informal carpools might be able to serve another commuter who works the same shift, or an additional participant in the same periodic activity. The baseline data forms the beginning of destination-driven ride matching.
- Once the baseline data quantifies a level of carpool usage, goals for increasing participation and incentives to attract more new carpools can be identified and implemented.

Vanpools are also an alternative to be considered for area commuting. The methodology described above for carpools is one way to begin building a database for informal vanpools. By asking vehicle capacity on the registration card, the information helps organizers build an “excess capacity” database.

This type of vanpool is very informal and maintains its schedule based on employee needs. Matching commuters from the same or other businesses is the growth potential. Again, the object is to quantify and document existing vanpool commuters and build the program where possible.

Another option is to provide businesses with an incentive to let the vehicle be used for a formal vanpool program with a wider group of employees. If the vehicle becomes a part of a formal program, maintenance, insurance and vehicle upkeep can be offered as an incentive. Such a fleet of vanpool vehicles can be used as “guaranteed ride home” vehicles for bus/rideshare commuters who have an unscheduled midday need to get home.

There are a few issues that arise with shared-use vehicles as described above. If the driver of the vanpool is an employee who is also commuting to work, the type of insurance needed is different than if the driver is paid or if the vehicles are used for other service during the day. As with any formal bus service, vanpools need back-up vehicles or a plan for alternate service.

Coordinating Local Human Services Transportation Programs

Arizona Rides is a statewide effort to coordinate provision of human services transportation within counties or regions of counties to increase efficiency, limit service duplication and confusion, and save costs. Arizona Rides was initiated in response to the federal “United We Ride” program established in 2004. “Pinal Rides,” a pilot project of the program, funded a study of the concept in Central Pinal County. The Final Report of the pilot project was published in December 2005. The pilot project consisted of two phases. In the first phase, existing human services transportation providers in Pinal County were inventoried, and potential areas of service duplication and inefficiency were identified. In Phase II, specific implementation objectives were identified, together with impediments to service coordination, and key service providers were selected for participation in a model coordination project. Recommendations included the establishment of a transit coordinating council for the study area and the implementation of service along two regional corridors.

Promoting the Dial-a-Ride Service

By far the most effective means of promoting the service, particularly in a small service area such as Southern Greenlee County, is by word-of-mouth. In order to get positive word-of-mouth efforts should be made to tailor the service to the needs of existing and potential riders to the extent possible. Transit Marketing, LLC, with CJI Research Corporation conducted a transit marketing study in 2006 that documented data gathering techniques used by a number of transit companies nationwide. Brief summaries of techniques used to obtain marketing data by the following transit systems were reviewed:

- Beeline, Westchester County, NY
- Big Blue Bus, Santa Monica, CA
- CATA, Little Rock, AR
- Champaign Urbana Mass Transit District, Champaign-Urbana, IL
- Chatham Area Transit (CAT), Savannah, GA
- Golden Empire Transit, Bakersfield, CA
- Hartline, Tampa, FL
- Intercity Transit, Olympia, WA
- KCATA, Kansas City, MO
- Lane Transit District, Eugene, OR
- LAVTA, Livermore, CA
- PeopleMover, Anchorage, AK
- Potomac and Rappahannock Transportation Commission, Woodbridge, VA
- Ride On, Montgomery County, MD
- Sacramento Regional Transit, Sacramento, CA

Table 36 summarizes the different techniques used by different operators:

By far the most popular means of gathering data among the agencies reviewed was the conduct of an on-board survey. On-board surveys can be used to gauge customer satisfaction with the current service as well as obtain suggestions regarding unmet needs. A draft of a survey that could be given to current users of the Clifton and Duncan vans is included as Appendix D.

Other methods employed were:

- Telephone surveys of service area residents as well as surveys of the dial-a-ride users themselves
- Conduct of focus groups consisting of existing and potential users of the service
- Internet surveys of students as well as employees of major employers
- Interviews with service area stakeholders such as major employers

Most of the transit operating agencies conduct periodic strategic plans where the data collected is assessed and indicated improvements are programmed.

TABLE 36. SUMMARY OF TRANSIT MARKETING DATA GATHERING TECHNIQUES

Transit Operation	Marketing Data Gathering Technique						
	Community Telephone Survey	Focus groups	Internet/E-mail survey	On-Board Survey	Origin-destination survey	Stakeholder interviews	User Telephone survey
Beeline				•	•		
Big Blue Bus				•			
CATA	•	•		•		•	
Champaign Urbana		•	•	•		•	
Chatham Area Transit	•	•		•		•	
Golden Empire Transit	•			•			
Hartline		•		•			
Intercity Transit			•	•			
KCATA				•			
Lane Transit				•			
LAVTA	•			•			•
PeopleMover	•			•			
Potomac and Rappahannock	•			•			
Sacramento Regional Transit	•			•			•

Source: CJI Research Corporation

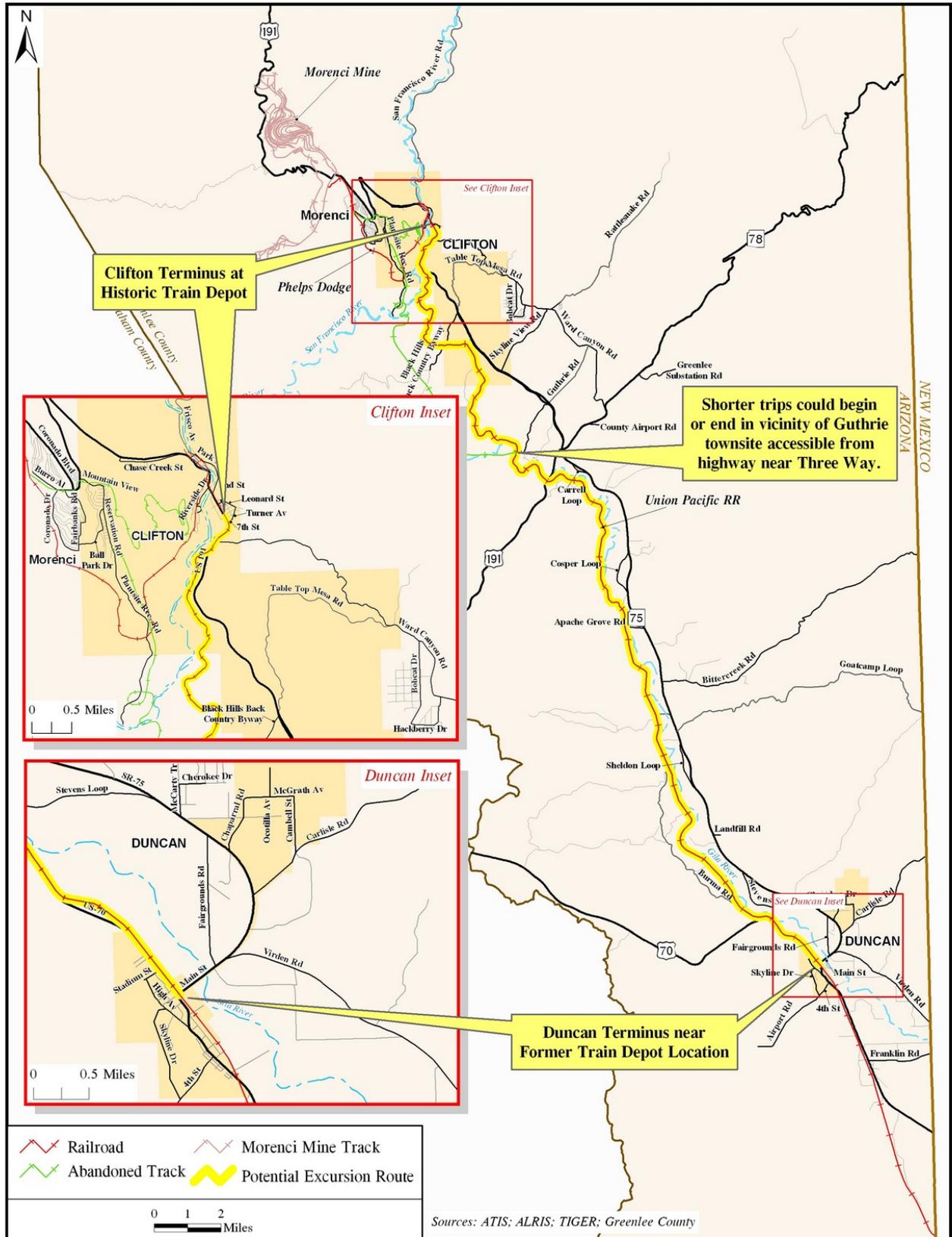
EXCURSION RAIL

The potential may exist to develop an excursion passenger train operation on the rail line between Clifton and Duncan. A map of the study area's rail lines with the potential excursion train route and terminals highlighted is shown in Figure 23.

The Union Pacific Railroad, which currently operates the rail line, operates periodic excursions on or near its main line through Nebraska or Wyoming using the company's historic steam locomotives based in Cheyenne. The UP also occasionally sponsors or participates in excursions to special events such as national conventions of the National Railway Historical Society. However, as company policy, the UP does not operate any regularly scheduled excursions elsewhere on its system.

According to the Tempe Public Transportation Department, the Union Pacific plans to sell the Lordsburg-Clifton branch to the Arizona Eastern, the shortline railroad that operates between Bowie and Globe, Arizona. The agreement will provide for trackage rights on the UP between Lordsburg and Clifton. This arrangement will allow switching for both branches to be performed in Lordsburg, streamlining operations. Iowa-Pacific Holdings, the holding company that owns the Arizona Eastern, currently operates an excursion train in Colorado, and may be interested in introducing excursion service on one of its Arizona properties.

FIGURE 23. COUNTY RAILROADS WITH POTENTIAL EXCURSION ROUTE HIGHLIGHTED



At the speed at which such service would likely operate, 15 miles-per-hour, a round trip between Clifton and Duncan would take approximately four hours—an ideal length of time for such a trip. The area through which the train would travel is scenic, as well. Alternatives to the four-hour round trip could include:

- A combination bus-rail tour that would originate in Safford, travel by bus to Duncan, board the train in Duncan, travel to Clifton by train, and return to Safford by bus. A different tour could make the same loop in reverse.
- A “dinner train” that would operate from either Duncan or Clifton, making a shorter trip of approximately two hours in length. Dinner would be served on the train, or provided picnic-style at a scenic point along the route.

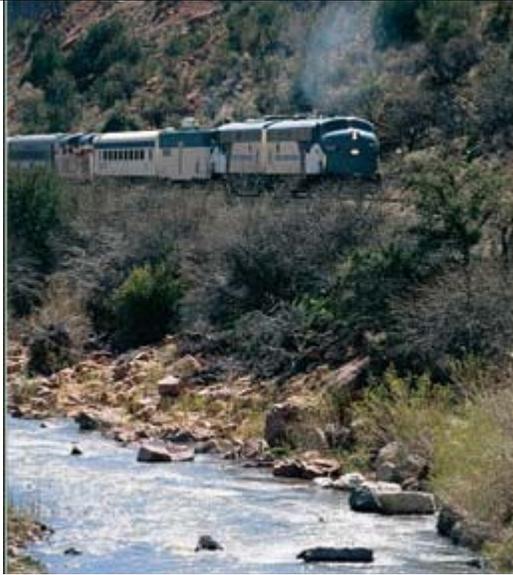
After being damaged in a flood in 1983, the Clifton Rail Passenger Depot was donated by the Railroad to the Town. The beautifully restored structure now houses an art gallery and office space, but is a potential asset to an excursion rail operation. In many communities, the depots have been razed, relocated away from the rail line, or converted to some adaptive use that is incompatible with a passenger rail operation. However, the Clifton depot is being used by the Chamber of Commerce and space for ticketing, restroom facilities, and a waiting room could likely be made available. The Duncan terminus of the operation could be developed near the location of the old passenger depot. Example excursion train services are presented in Figure 24.

Potential Excursion Train Ridership

Projecting the potential ridership for a Greenlee County Excursion train operation is beyond the scope of this project. However, the comparatively remote location of the County itself does not preclude a successful operation. The popular Cumbres and Toltec Scenic Railroad operates in an isolated mountainous area along the New Mexico/Colorado Border that is almost as far from its principal Albuquerque market as Clifton is from Tucson—and over more difficult roads. The closest existing excursion rail operation to Tucson—Verde Canyon—is just as far from Tucson as Clifton is, and traveling from Tucson to Clarkdale involves negotiating Phoenix area traffic. A Greenlee County rail excursion would be the closest such operation to the El Paso and Las Cruces areas, as well.

Note, however, that successful excursion rail operations have plenty of supporting services such as nearby hotels, motels, campgrounds, and complementary attractions. Verde Canyon Railroad activities, for example, are marketed with a chuck wagon ranch experience and other attractions in the Sedona/Verde Valley area. Many motels and resorts are nearby even though staying overnight is less of an issue with an operation such as Verde Canyon that is an easy two-hour drive from many parts of Phoenix. The Grand Canyon Railway restored a hotel in Williams, its terminus, and also built a restaurant. Several other new motels were developed in the Williams area subsequent to the opening of the rail line.

FIGURE 24. EXAMPLE EXCURSION TRAIN SERVICES



—Verde Canyon Railroad photo

Arizona’s Verde Canyon Railroad travels through some of the most spectacular scenery of any excursion train route. A Greenlee County service, while arguably somewhat less spectacular, would traverse scenery not too different from that experienced by the Verde Canyon’s passengers—river side running, beautiful mountain views, and areas not accessible by highway. Ideal four-hour trips similar to those Verde Canyon provides could be operated between Clifton and Duncan.

Verde Canyon first class passengers travel in beautifully restored rail cars with modern, comfortable seating. Special runs such as moonlight trips (during full moon weekends) are popular. Adult first class fares are \$79.95, and adult coach fares are \$54.95. All passengers have access to open observation cars for superior scenery viewing during the journey.



—Verde Canyon Railroad photo



—McCloud Railway photo

The Shasta Sunset Dinner Train operates in Siskiyou County, California (Year 2000 population, 44,200). The nearest large city, Redding, (population 88459) is an hour’s drive from the station. The three-hour trip includes a four-course gourmet meal for \$90.00 per person.

Demonstration Operation and Feasibility Study

If and when Union Pacific sells the branch to the Arizona Eastern Railway—a feasibility study should be conducted to develop a pro-forma for such an operation including capital and operating costs, projected ridership, marketing and maintenance programs and other issues.

During the spring of 2006, demonstration excursion runs were operated in Gila County between downtown Globe and the Apache Gold Casino using a restored self-propelled railcar. Local and Tribal funds were used, together with support from the Arizona Eastern. Lima & Associates is currently conducting a feasibility study of passenger rail operations in the Globe area based on the findings from the demonstration and peer operation experience. The findings of this study, which should be completed early in 2008, will provide additional guidance to Greenlee County with regard to the excursion train concept.

6. BEST PRACTICES IN RURAL TRANSPORTATION

The purpose of this chapter is to present selected transportation practices that other rural areas have employed for improving the planning and programming of transportation options in their jurisdictions. Greenlee County is currently smaller in both population and area than the jurisdictions examined, but the Study Area has begun to develop in response to increased Freeport McMoRan activity at their Morenci Mine as well as the development of the new mine in neighboring Graham County. In the future, some or all of the following practices may be appropriate for consideration by Greenlee County:

- Analysis of Low Volume Dirt Roads
- Performance Measures for Rural Transportation Systems
- Analysis of Highway-Rail Grade Crossings
- Activity Based Budgeting
- New Paradigms for Rural and Small Urban transit Service Delivery
- Rural Transit ITS

ANALYSIS OF LOW VOLUME DIRT ROADS

Greenlee County maintains approximately 55 miles of regionally significant unpaved roads in the study area. As the County population increases, keeping a concise inventory of unpaved roadway segments and prioritizing paving of these segments in order to handle increased traffic volumes or control dust will become critical. The following describes a methodology to inventory data for unpaved roads and prioritize paving projects.

Maricopa County Department of Transportation (MCDOT) has initiated a program to pave low volume unpaved roads throughout the entire county. The county has a current paving program focused on roadways within the PM10 non-attainment area to help control dust within the metropolitan parts of the county. The Transportation Advisory Board (TAB) recommended an annual program of \$3 million, which, based on past experience, would allow for paving between seven and eight miles of roadway per year. The County initiated a study to provide a comprehensive GIS inventory of unpaved roadways and to use adopted evaluation criteria for selecting future paving projects. The results of the study are documented in the *Final Candidate Assessment Report: Identification and Analysis of Low Volume Dirt Roads*, completed in 2005 for MCDOT by Lima & Associates. The required work included developing a set of detailed maps of the county unpaved road system and a complete listing of the entire roadway inventory with detail on all evaluation criteria. The key components of the methodology to analyze dirt roads include:

Unpaved Roads Map Atlas - Detailed maps covering the entire county were developed from existing data sources based on recorded surface type with additional unpaved roads added from aerial photography. The maps can be used to understand, for any given area, how many and what type of unpaved roads are present.

Low Volume Unpaved Roads Evaluation Matrix – The MCDOT Transportation Advisory Board adopted a specific set of evaluation criteria, including:

- What Supervisor District the segment is located in.
- Length of the roadway segment (miles).
- If the road segment is located inside or outside the PM10 area.
- If the road segment is County maintained or not.
- The Major Streets and Routes Plan classification.
- Average Daily Traffic (ADT) count.
- If the road segment connects to an existing paved road.
- The percent of Right-of-Way that exists.
- If the segment serves a public facility.
- If there are any safety concerns (high accident rate for instance).
- The cost per mile.
- The total project cost

Low Volume Unpaved Roads Data – A report on the data includes all of the adopted evaluation criteria and additional data items to provide MCDOT even more detailed information on each roadway segment. This information can help in sorting and prioritizing roads for paving projects. Table 37 lists an inventory for a sample of dirt roads along with priority for paving.

PERFORMANCE MEASURES FOR RURAL TRANSPORTATION SYSTEMS

Performance measures can be used to evaluate the performance of the Southern Greenlee County transportation system. A guidebook is under development by the California Department of Transportation for measuring, assessing, and improving the performance of a rural transportation system. The development of the guidebook was described in a presentation made to the California Association for Coordinated Transportation Conference, held October 6, 2005. The guidebook is scheduled for completion by the end of May 2006.

Performance measures that have been identified include:

- Mobility/Reliability/Accessibility
- System Preservation
- Coordinated Transportation and Land Use
- Equity
- Customer Satisfaction
- Provide Alternative Modes of Transportation
- Productivity
- Environmental Quality
- Economic Development
- Return on Investment
- Transit Cost Effectiveness

TABLE 37. SAMPLE LOW VOLUME UNPAVED ROADS EVALUATION MATRIX

Proposed Projects	Township Range	BOS District	Length (Miles)	PM10 Area	County Maintained Road	Road Classification	ADT Count	Connects to Paved Road	Percent of ROW Existing	Public Facility Served	Safety Concern	Cost/Mile (000's)	Total Project Cost	Priority
132nd St: At Chandler Heights Rd	T02SR05E	1	0.50	Yes	Yes	Urban Local	106	Yes	100		No	\$ 155,506	\$ 77,749	
142nd St	T02SR06E	1	0.25	Yes	No	Rural Local	0	Yes	0		No	\$ 337,589	\$ 85,587	
142nd St	T02SR06E	1	0.24	Yes	No	Rural Local	0	No	0		No	\$ 337,590	\$ 81,911	
146th St: At Spur Rd	T02SR06E	1	0.25	Yes	Yes	Rural Local	33	Yes	100		No	\$ 155,507	\$ 38,877	
164th St	T02SR06E	1	0.39	Yes	No	Rural Local	0	Yes	0		No	\$ 276,894	\$ 107,925	
164th St	T02SR06E	1	0.50	Yes	No	Rural Local	0	Yes	0		No	\$ 276,896	\$ 138,547	
174th St	T02SR06E	1	0.51	Yes	No	Rural Local	0	Yes	0		No	\$ 276,893	\$ 141,089	
180th St	T02SR06E	1	0.26	Yes	No	Rural Local	0	Yes	0		No	\$ 276,893	\$ 70,674	
182nd St	T02SR06E	1	0.26	Yes	No	Rural Local	0	Yes	0		No	\$ 276,892	\$ 70,617	
182nd St	T02SR06E	1	0.25	Yes	No	Rural Local	0	No	0		No	\$ 276,895	\$ 70,465	
183rd St	T02SR06E	1	0.26	Yes	No	Rural Local	0	Yes	0		No	\$ 276,896	\$ 70,999	
183rd St	T02SR06E	1	0.26	Yes	No	Rural Local	0	No	0		No	\$ 276,895	\$ 70,769	
194th St	T02SR07E	1	0.25	Yes	No	Rural Local	0	Yes	0		No	\$ 276,894	\$ 69,892	
194th St	T02SR07E	1	0.25	Yes	No	Rural Local	0	Yes	0		No	\$ 276,896	\$ 70,064	
194th St	T02SR07E	1	0.25	Yes	No	Rural Local	0	Yes	0		No	\$ 276,895	\$ 69,072	

Source: Maricopa County Department of Transportation, *Final Candidate Assessment Report: Identification and Analysis of Low Volume Dirt Roads*, Lima & Associates, 2005.

Rural counties in California have been categorized by population, population growth rate, and ratio of peak month to average annual daily traffic. The guidebook with identify performance data, develop definitions, and describe data collection procedures.

ANALYSIS OF HIGHWAY-RAIL GRADE CROSSINGS

One tool for the County to use in evaluating the impact of at-grade railroad crossings along the Union Pacific's Clifton Branch is the Federal Railroad Administration (FRA) GradeDEC.NET highway-rail grade crossing investment analysis tool. This tool was developed to provide grade crossing investment decision support. GradeDEC.NET is a web-based application that has been available to the public since 2003 (<http://gradedec.fra.dot.gov/>). The application provides a full set of standard benefit/cost metrics for a rail corridor, a region, or an individual grade crossing. The model output allows a comparative analysis of grade crossing alternatives that are designed to mitigate highway-rail grade crossing accident risk and other components of user costs including highway delay and queuing, air quality, and vehicle operating costs. The application calculates the economic rate of return by comparing the streams of expected economic benefits over time with the streams of investment, operation and maintenance, and other life-cycle costs. The model discounts later year benefits and costs to reflect the opportunity cost of capital. This process of discounting converts all values to present value equivalents, thus enabling the comparison of benefits and cost realized in different time periods.

GradeDec.NET is a stand-alone software package that enables the analysis of impacts from grade crossing improvements and supports resource allocation and investment decisions. The application evaluates the benefit cost of grade crossing improvements while explicitly reporting the results for each grade crossing and each benefits category including safety, time savings, vehicle operating costs, reduced emissions, network benefits, and local benefits. GradeDec.NET's analysis of grade crossing improvements can be performed both at the individual grade crossing and at the corridor or regional level within separate modules in the application. The corridor analysis module evaluates crossing improvements along a single rail alignment and accounts for impacts on the adjacent highway network and shifts by motorists to routes with improved crossings. The module for regional analysis evaluates crossing improvements in a region regardless of the crossings being located on single or multiple rail alignments. Outputs of the model include result metrics for the individual grade crossings and for the corridor or region as a whole.

ACTIVITY BASED BUDGETING

The Roads Division of Clackamas County, Oregon uses a "Road Fund Activity-Based Budget" to allocate limited revenues to road maintenance activities. Instead of traditional line item budgeting, the Division created a system for prioritizing work activities by identifying value added activities balanced against rising service demand and declining resources. This system focuses on required activities, expected service level or outcomes, and coordination of

resources to budget \$31 million worth of services. The purpose of creating the “Road Fund Activity Based Budget” was to increase the accountability, effectiveness, and credibility of the budget process. To achieve this goal, Clackamas County worked to develop and implement a budget process using existing resources. The County involved all staff levels, ranging from department managers to field employees, in creating benchmarks for each activity.

Activity Documentation

The “Road Fund Activity Based Budget” details each activity performed within the road fund and resources required to produce expected results. The budget process details all activities required to maintain service levels in the Clackamas County Road Fund Strategic Plan. The budget is structured with descriptions of each activity. Activity documentation with expected outcomes provides managers a tool for adjusting expenditures to achieve the greatest value from varied revenue scenarios. The elements used to describe an activity are the following:

- ***Description of Activity:*** A description of each activity is developed providing general overview information regarding the activity or process.
- ***Regulatory Requirements:*** A description of any mandate or agency regulation required by the activity.
- ***Benefits of Maintaining Present Level of Service:*** The benefits of continuing to fund a specific activity at the current level-of-service.
- ***Consequences of Reduction in Activity:*** Description of the consequences by reducing funding for a specific activity.
- ***Expected Outcomes:*** Description of the product achieved, as a result of funding this activity.
- ***Expenditures/Revenue at Present Level of Activity:*** A detail of all resources and materials required to fund the activity. Any revenue generated by completing this activity is documented.

Responsiveness to Public

One of the County’s main goals of creating a new budget process was to more effectively communicate to voters, legislators, and policy makers expected specific budget outcomes. The “Activity Based” budget process has become an effective communication tool to show citizens, as well as their own staff, why funds are allocated to certain areas and not allocated to others. The activity based budget helped identify and reduce competition for available dollars between divisions within the Transportation Department.

Success of Program

Clackamas County considers the “Road Fund Activity-Based Budget” a very successful program, praised alike by managers, policy makers, county commissioners, citizens, and County employees. Clackamas County describes the success of the program by the following measures:

Effective Communication Tool - The Road Fund Activity-Based Budget has been used successfully in public meetings to communicate the Road Fund output goals. It has become a document that can be used to inform the public and policy makers what level-of-service can be provided under varied funding scenarios.

Reduced Interdepartmental Competition for Funds - The Activity Based Budget process has identified activities that have traditionally over allocated resources and increased fund variances. Large complex activities require the involvement of numerous functional units within County government. This created situations where one functional area did not know what the other was doing.

Increased Accountability and Stewardship of Resources by all Stakeholders - The documentation of detailed clear descriptions of expenditures and outcomes for each activity has established performance benchmarks for each activity. Employees involved with each activity have been consulted and informed of the budget restraints and expected outcomes.

Increased Accuracy of Budget Projections - Fund variance and overall accuracy of the budget has improved from prior years.

More Efficient Process which increases Staff Efficiency - The activity-based budget process has achieved a 20 percent reduction in staff time required to complete the annual budget process.

NEW PARADIGMS FOR RURAL AND SMALL URBAN TRANSIT SERVICE DELIVERY

The Transit Cooperative Research Program (TCRP) *Report 99 Embracing Change in a Changing World*, published in 2004 documents four case studies of transit systems that have adapted to the changing and growing rural areas. Rural transit operators need to adapt transit service strategies to deliver effective service. Development is pushing farther into rural areas and businesses are moving to the urban fringes. The four case studies that were documented are: 1) Advance Transit serving communities in New Hampshire and Vermont; 2) COAST providing transit service in Colfax, Washington; 3) Hill County Transit District (HCTD) providing transportation in nine counties of central Texas; and 4) Capital Area Rural Transportation System (CARTS) providing transportation services for a nine-county area surrounding Austin, Texas. The new paradigms reflected by these systems are:

- *Serving as Community Agents of Change* by understanding changes in the community and adapting to these changes through active involvement with the community.
- *Optimizing Rural Resources* by stretching resources, sharing costs, and contracting using innovative approaches to providing more service.
- *Adopting Technology* by implementing intelligent transportation systems (ITS) for rural areas to benefit the transit system operations and users.
- *Acting as Entrepreneurs* by operating as businesses seeking to provide services to both the private and public sectors reducing reliance on governmental funding.
- *Providing Effective Service* by attracting ridership, bringing in significant revenue, and enhancing quality of life.
- *Maintaining Multiple Functions and Fiscal Diversity* by doing more such as selling advertising, maintain other organization's vehicles, operating maintenance services.

RURAL TRANSIT ITS

Best practices in rural ITS were documented in the US DOT *Final Report, Rural Transit ITS Best Practices*, March 2003. The following information is cited in the final report.

Project objectives were to:

- Identify rural transit operators that exhibit best practices for ITS User Services in operating their transit systems using ITS technology;
- Target case study sites to cover a range of rural transit services using ITS technology including, to the extent possible, fixed route, flexible routes and paratransit services;
- Report functional and limited technical information on the technologies and applications that the case study sites have applied to their rural transit services;
- Report on the lessons learned by the case study participants; and
- Summarize overall considerations for the application of ITS to rural transit learned from the case studies.

The report documented the following case studies:

River Valley Transit: Located in Williamsport, Pennsylvania, the agency provides real-time customer information at its transit center. River Valley Transit installed automatic vehicle location (AVL) and mobile data terminals (MDT) on its fixed-route buses to provide real-time, in-terminal customer information. The technology allows the agency to inform customers both visually and audibly as to which of the 10 loading bays buses will arrive at and depart from. It also gives customers a 20-second notification before buses depart on their next trip. The system even notifies drivers when they have pulled into the wrong bus bay. River Valley

Transit is looking at ways to extend the utility of the system and has investigated other ITS technologies.

Florida Commission for the Transportation Disadvantaged (CTD): Through the CTD, a number of primarily rural counties have created low-cost ITS applications using seed funding from the FTA. The deployments are part of a statewide Rural ITS initiative. The project has been implemented in two phases. In addition to information from the CTD, the case study also includes information gathered during site visits at two of the Phase I counties (St. Johns and Putnam), and one of the Phase II counties (Marion). Marion and St. Johns counties have been using a demand-response software suite developed by RouteLogic. The software has a range of modules including vehicle scheduling, staff scheduling, trip scheduling, call-intake, and payroll. As of February 2002, the system had been in place for over a year in these two counties. It has turned the operation in St. Johns County from a struggling service to a thriving, cost-effective one. Putnam County, by contrast, has opted to use a proprietary software system it had developed and integrated with AVL. The RouteLogic application is being used as the model to improve the operations and management of other rural transit operators in the state.

Capital Area Rural Transit System (CARTS): Providing rural transit service in a large area outside of Austin, Texas, CARTS is a partner in the Lower Colorado River Authority's (LCRA) communications system. The system provides CARTS with voice channels on LCRA's 900MHz radio system, which replaced the patchwork of unreliable radio links CARTS used previously. This new communication system has allowed CARTS to reorganize and more efficiently provide its paratransit service. CARTS's agreement with LCRA was negotiated to provide enough communication capacity in the future so that CARTS could add AVL/MDT or other ITS technologies. The agency has started work on deploying AVL/MDT technology.

Ottumwa Transit Authority (OTA): OTA is responsible for providing bus service in Ottumwa, Iowa and the surrounding 10-county area covering 5,000 square miles. After attempting to share resources with nearby Linn County, OTA installed a four-tower, 150 MHz radio system to provide communications for its AVL/MDT system throughout its large service area. At the time of the site visit, the package had been in place for about 18 months. One unique feature of OTA's system is a form-based MDT log-on/pre-trip procedure that requires drivers to transmit information to central dispatch regarding the mechanical condition of a vehicle. This feature is especially useful for the approximately 40 vehicles that are garaged at drivers' homes, some of which are over 50 miles away from OTA headquarters. The OTA uses the pre-trip information to determine if maintenance should be scheduled at the agency's central garage or could be repaired by one of its subcontracted, out-of-county mechanics.

New Mexico Statewide Rural Internet-Based Ridership and Financial Tracking System: Led by the Alliance for Transportation Research Institute (ATRI), this project is an interagency effort that includes the New Mexico Human Services Department Income Support Division and rural transit service providers. The project was chosen because it is a statewide, multifunctional, Web-based application that has a number of unique features.

The project is being deployed in three parts. During part one, ATRI developed a Web-based software program to authorize and schedule trips, track riders, bill trips, and generate reports. The Web-based application is designed to save costs of and the time required to install, troubleshoot, and upgrade the software by having a single application reside on a Web server that is accessible to users over the Internet. Part two involves establishing the Internet connections between the central server and the rural agencies so they can report trips and expenditures to a central server. This phase was completed in October 2002. Part three of the project currently is procuring a multipurpose electronic fare card system and card readers for transit vehicles and integrating them with the software system. The system will use the state's electronic benefits transfer (EBT) card to track transportation benefits for clients. General public riders will also be able to buy disposable, magnetic stripe passes that can be used on transit vehicles.

7. CAPITAL IMPROVEMENT PROGRAM AND IMPLEMENTATION PLAN

This chapter presents a capital improvement program designed to address the transportation challenges faced in Southern Greenlee County, together with a plan for implementing the program in short-, mid-, and long-term phases. Draft recommendations were presented to the County Project Manager, the Town Managers of Clifton and Duncan, and the Technical Advisory Committee for review and comment.

Draft recommendations include over 70 miles of right-of-way acquisition, preservation, and surveying; 58 miles of minor roadway widening; and 38 miles of roadway construction and reconstruction. Roadway standards presented in this Chapter are recommended as guides for roadway widening, construction, or reconstruction. Order of magnitude draft cost estimates were developed based on data provided by the County Project Manager or by the experiences of peer jurisdictions. The most expensive set of projects is the rehabilitation or replacement of 14 bridges in the Study Area, estimated to cost over \$24 million. The construction or reconstruction of 38 miles of roadway is estimated at \$16.5 million; roadway widening at about \$3.5 million; and right-of-way preservation at just over \$3 million. Just over \$1 million is programmed for pedestrian sidewalks and walkways, and just under \$1 million is estimated for recommended studies and plans, and miscellaneous items estimated at \$280,000. These include the conduct of an Access Management Implementation Plan in the York Valley area, a Trail System Strategic Plan, and the future purchase of shuttle vans to replace those acquired for Clifton and Duncan in 2006.

Of the total of \$49.6 million in projects, \$27.5 million is estimated for the Clifton area, \$4.7 million for the Duncan area, and \$17.4 million for the remainder of the Study Area. Table 38 lists the short-term projects; Table 39 lists the mid-term projects; and Table 40 lists the long-term projects. As a reference, the “Standard Code” refers to the cross-sections presented in this Chapter.

IMPLEMENTATION PLAN

Funding permitting, the short-term projects are intended to be addressed within five years, or by 2012. Mid-term projects would be addressed within 10 years, or by 2017; and long-term projects within 20 years, or by 2027.

In areas such as Southern Greenlee County, where the population growth rate is very low, mobility concerns caused by future traffic congestion are less likely to occur. However, existing traffic safety concerns exist in any jurisdiction, regardless of the growth rate. For example, geometries of both paved and unpaved roads need to be corrected to enhance safety as well as the utility of the roadways.

At the same time, the comparatively low level of tax revenues generated by smaller communities such as those that comprise the Study Area does not facilitate the funding of necessary improvements.

TABLE 38. SOUTHERN GREENLEE COUNTY - SHORT-TERM PROJECTS

Road or Project Name	From	To Reference	Improvement Type	Standard Code	Total Cost	Jurisdiction
Trail System Strategic Plan	Throughout Study Area including utility corridors, abandoned rail lines, SR 75 Corridor, Duncan area		Trail System Strategic Plan		200,000	County
Billingsly Loop	SR 75 - 379.4 E	67027 S	Minor roadway widening	GCUL2	62,384	County
Clesa Drive	67002 S	67002 - S	Minor roadway widening	GCUL2	85,175	County
County Club Road	SR 75 - 394.3 E	End Pvmt	Acquire right-of-way	GCUL2	4,327	County
Fairgrounds Road	SR 75	SR 75	Minor widening	GCUL2	71,400	County
Guthrie Road	US 191	Gila River	Reconstruct and Pave	GCRL2	909,500	County
Old Safford Road	Abandoned RR OP	2.71 mi W Jct US 191	Rehabilitate bridge	N/A	182,000	County
Old Safford Road	SPRR Overpass	1.05 mi W Jct US 191	Rehabilitate bridge	N/A	182,000	County
Plantsite Rec. Road to Burma Road	Clifton	Duncan	Study new roadway parallel to SR 75 west of Gila River	GCRC2	250,000	County
SR 75	Three Way	Duncan	Preserve right-of-way for future improvements	GCRC2	585,600	County
SR 75		York Valley Area	Access Management Implementation Plan	GCRC2	100,000	County
SR 78	Three Way	State Line	Preserve right-of-way for future improvements	GCRC2	605,400	County
Stevens Loop Road	Medium Wash Bridge	0.7 mi W Jct SR 75	Rehabilitate bridge	GCRL2	82,000	County
Stevens Loop Road	Waters Wash Bridge	0.5 mi S Jct SR 75	Rehabilitate bridge	GCRL2	82,000	County
US 191	County Line	Three Way	Preserve right-of-way for future improvements	GCRL2	716,400	County
Ward Canyon Road to Campbell Street	Clifton	Duncan	Study new roadway parallel to SR 75 as extension of Wards Canyon Road alignment	GCRC2	250,000	County
Sheldon Loop Road	Goat Camp Canyon Bridge	1.0 mi S Jct SR 75	Rehabilitate bridge	N/A	82,200	County
Fairgrounds Road	Packer Wash Bridge	0.4 mi N Jct SR 75	Rehabilitate bridge	N/A	82,200	County
SR 75	At MP 395.7, York Valley	Cottonwood Creek	Construct pedestrian walkway bridge	N/A	514,638	County
			Subtotal		5,047,224	

TABLE 38. SOUTHERN GREENLEE COUNTY - SHORT-TERM PROJECTS (CONTINUED)

Road or Project Name	From	To Reference	Improvement Type	Standard Code	Total Cost	Jurisdiction
2nd Street	US 191	Leonard Street	Minor Widening	GCUL2	\$5,400	Clifton
7th Street	US 191	Turner Avenue	Minor Widening	GCUL2	3,600	Clifton
Park Avenue	East Bridge Street	US 191	Minor Widening	GCUL2	39,000	Clifton
Plantsite Rec. Road	Reservation Morenci	Railroad Tracks	Reconstruct to the Correct Surface Type	GCUL2	693,419	Clifton
Riverside Drive	US 191	Shannon Road	Minor Widening	GCUL2	15,000	Clifton
Skyline View Road	U.S. 191 - 157.2(E)	67003	Reconstruct to the Correct Surface Type	GCUC2	783,172	Clifton
Skyline View Road	67003	67099A	Reconstruct to the Correct Surface Type	GCUC2	87,296	Clifton
Table Top Mesa Road	US 191	Ward Canyon Road	Reconstruct and Pave	GCRL2	1,419,500	Clifton
Turner Avenue	Leonard Street	7th Street	Minor widening	GCUL2	9,600	Clifton
Ward Canyon Road	U.S. 191 MP 162.8 - E	Skyline View Road	Reconstruct to the Correct Surface Type	GCUC2	264,383	Clifton
Ward Canyon-US 191	Ward Canyon Road	US 191	Study connecting roadway	GCUC2	150,000	Clifton
US 191	Copper Crystal Park	200 Chase Creek	Construct pedestrian sidewalk	N/A	277,895	Clifton
				Subtotal	\$3,748,265	
Campbell Street	McGrath Avenue	Carlisle Road	Reconstruct and Pave	GCUL2	216,750	Duncan
Carlisle Road	SR 75	End (State Line)	Reconstruct and Pave	GCRL2	1,619,250	Duncan
High Street	Stadium Street	US 70	Minor widening	GCUL2	36,000	Duncan
Lower Eagle Road	U.S. 191 - 171.6 W	Eagle Creek	Minor roadway widening	GCUL2	395,229	Duncan
Luntville Road	67002 S	67007 End	Survey right-of-way	GCRL2	10,000	Duncan
Luntville Road	67002 S	67007 End	Minor roadway widening	GCRL2	29,086	Duncan
Main Street	High Street	Railroad Avenue	Reconstruct to the Correct Surface Type	GCUL2	42,500	Duncan
Ocatilla Avenue	McGrath Avenue	End	Reconstruct and Widen	GCUL2	110,500	Duncan
Old Virden Road	SR 75 - 379.3 E	67008	Minor roadway widening	GCRC2	54,755	Duncan
US 70	MP 378	Wilson Street	Construct pedestrian walkway	N/A	217,600	Duncan
				Subtotal	\$2,731,670	
				TOTAL	\$11,527,159	

TABLE 39. SOUTHERN GREENLEE COUNTY - MID-TERM PROJECTS

Road or Project Name	From	To Reference	Improvement Type	Standard Code	Total Cost	Jurisdiction
Apache Grove Road	SR 75 - 391.8 W	End	Minor roadway widening	GCRL2	12,544	County
Bitter Creek Road	SR 75	End (State Line)	Minor Widening	GCRL2	574,800	County
Bobcat Drive	Ward Canyon Road	Hackberry Drive	Minor Widening	GCUL2	64,800	County
Burma Road	SR 75	US 70	Minor widening	GCRL2	520,800	County
Carrell Loop	SR 75	SR 75	Minor widening	GCRL2	35,400	County
Cosper Loop	SR 75	SR 75	Minor widening	GCRL2	88,800	County
Goatcamp Loop	SR 75	End (State Line)	Minor widening	GCRL2	567,000	County
Rattlesnake Road	Loma Linda Road	Forest Service Boundary	Reconstruct and Pave	GCRL2	2,337,500	County
San Francisco River Road	Frisco Avenue	End	Reconstruct and Pave	GCRL2	2,979,250	County
Sheldon Loop	SR 75	SR 75	Minor widening	GCRL2	97,800	County
Stevens Loop	SR 75	SR 75	Minor widening	GCRL2	168,000	County
UPRR	Clifton Depot	Duncan Depot site	Study Excursion Train	N/A	100,000	County
				Subtotal	\$7,546,694	
Calle Alta Vista	Skyline View Road	Rattlesnake Road	Reconstruct to the Correct Surface Type	GCUL2	89,150	Clifton
Frisco Avenue	US 191	Clifton Limits	Minor Widening	GCUL2	79,800	Clifton
Hackberry Drive	Bobcat Drive	Ward Canyon Road	Minor Widening	GCUL2	40,200	Clifton
Leonard Street	2nd Street	Turner Avenue	Minor Widening	GCUL2	9,600	Clifton
McCarty Trail	SR 75	Cherokee Drive	Minor widening	GCUL2	17,400	Clifton
Park Avenue	San Francisco River Bridge	100'W of US 191	Replace bridge	N/A	5,000,000	Clifton
Replacement Clifton Van			Special needs transportation	N/A	40,000	Clifton
Reservation Road	Mountain View	Plantsite Rec. Road	Survey and Design	GCRL2	30,000	Clifton
Ward Canyon Road	Soap Box Canyon Bridge	3.39 mi E Jct US 191	Replace bridge	N/A	2,500,000	Clifton
				Subtotal	\$7,806,150	
4th Street	US 70	Skyline Drive	Minor widening	GCUL2	\$30,000	Duncan
Carlisle Road	SR 75 - 380.1 E	N.M. State Line	Survey right-of-way	GCRL2	10,000	Duncan
Carlisle Road	SR 75 - 380.1 E	N.M. State Line	Minor roadway widening	GCRL2	135,398	Duncan
McGrath Avenue	Chaparral Road	Campbell Street	Minor widening	GCUL2	22,200	Duncan
Replacement Duncan Van			Special needs transportation	N/A	40,000	Duncan
Wilbur Lunt Road	67002 S	67002 S	Minor roadway widening	GCUL2	58,173	Duncan
				Subtotal	\$295,771	
				TOTAL	\$15,648,615	

TABLE 40. SOUTHERN GREENLEE COUNTY - LONG-TERM PROJECTS

Road or Project Name	From	To Reference	Improvement Type	Standard Code	Total Cost	Jurisdiction
Franklin Road	U.S. 70 - 382.1 E	N.M. State Line	Survey right-of-way	GCRC2	10,000	County
Franklin Road	U.S. 70 - 382.1 E	N.M. State Line	Correct Drainage	GCRC2	200,000	County
Franklin Road	U.S. 70 - 382.1 E	N.M. State Line	Construct Roadway	GCRC2	816,000	County
Guthrie Road	US 191	Wards Canyon Road	Reconstruct and Pave	GCRL2	909,500	County
Old Safford Road	Pumroy Canyon Bridge	6.4 mi W Jct US 191	Rehabilitate bridge	N/A	300,000	County
US 70	US 191	State Line	Preserve right-of-way for future improvements	GCRC2	1,073,100	County
Virden Road	SR 75	End (State Line)	Reconstruct and Widen	GCRC2	1,487,500	County
			Subtotal		\$4,796,100	
Chase Creek Road	Chase Creek Bridge #3	200'S Jct US 191	Rehabilitate bridge	N/A	300,000	Clifton
City Parking Lot	Chase Creek Bridge	adjacent to # 307 on 191	Rehabilitate bridge	N/A	300,000	Clifton
Coomb Street	Chase Creek Bridge #2	50'S Jct US 191	Rehabilitate bridge	N/A	300,000	Clifton
Frisco Avenue	Chase Creek Bridge #1	0.1 mi N of Park Ave	Replace bridge	N/A	5,000,000	Clifton
Reservation Road	Mountain View	Plantsite Rec. Road	Minor Widening	GCRL2	60,000	Clifton
UPRR	UP RR Bridge	300 ft E of Jct US 191	Replace bridge	N/A	10,000,000	Clifton
			Subtotal		\$15,960.00	
Airport Road	Skyline Drive	End	Reconstruct and Pave	GCRL2	\$1,088,000	Duncan
Chaparral Road	SR 75	McGrath Avenue	Minor widening	GCUL2	35,400	Duncan
Cherokee Drive	McCarty Trail	Shoshone Lane	Reconstruct and Widen	GCUL2	102,000	Duncan
Skyline Drive	D Street	Airport Road	Reconstruct and Widen	GCUL2	467,500	Duncan
			Subtotal		\$1,692,900	
			TOTAL		\$22,449,000	

Insufficient funds exist to implement many of the recommended improvements. The Transportation Improvement Program presented in this chapter can be used by the County to draw attention to the unfunded needs that exist. While the long-term project list incorporates many of the higher priced projects, an effort was made, with proactive input from the County Project manager, to prioritize projects based on need. For example, improvements to all of the collector roadways experiencing multiple crashes are listed as short-term projects.

Despite the funding shortfall, the County should take the initial steps toward implementing the program. While Greenlee County is not currently experiencing significant population growth, that could change. A housing boom is taking place in neighboring Graham County as Freeport-McMoRan opens the new Safford Mine. Mining activity at Morenci itself is also increasing. Freeport-McMoRan advertises in the Phoenix and Tucson newspapers for employees and offers cash bonuses to compensate for the commuting time between those cities and the mines. Freeport-McMoRan operates free shuttle service from Safford park-and-ride lots and, according to the operator of the Safford Airport, has even been flying in management-level personnel from Phoenix, Tucson, and elsewhere.

As real estate prices increase in Graham County, mine employees may look to Greenlee. The commute from Duncan to Morenci is no longer than that from Safford, and the commute from other residential areas such as Three-Way and York Valley is even shorter. Significant population growth in any of these areas would quickly lead to increased traffic volumes, especially on “commute routes” between these locations and the Morenci Mine. More mine employees will attract more retail and other services, making scenic Greenlee County even more attractive to retirees—accelerating the population growth.

The consultant recommends that the County take the following initial steps toward plan implementation:

Establish an Implementation Task Force. Such a Task Force could be a continuation of the Technical Advisory Committee established to oversee the conduct of this study and include the County Engineer, the Town Managers of Clifton and Duncan, and representatives from SEAGO and the ADOT District.

Identify Responsibilities and Timeline. The first task of the Task Force would be to identify Task Force roles, such as keeping in contact with local State Legislators, ADOT, SEAGO, and other potential funding sources. Rather than “hard” dates, the Timeline could be a series of milestones triggered by specific thresholds such as new funding sources, population growth, and so forth.

Program ADOT and County Projects. Working through the ADOT District and SEAGO, the Task Force should ensure that essential projects are included in the current Transportation Implementation Plans of these agencies. As the prioritization of projects is revised over time, the costs of borrowing funds in the short term will need to be weighed against the risk that future right-of-way acquisition, engineering, and construction costs will be higher in the long-term.

The Task Force should take these specific actions for implementation:

- Adopt Transportation Plan and Transit Element
- Adopt Cross Section Standards
- Adopt Access Management Strategies
- Adopt Trails Map
- Implement Traffic Impact Analysis Review
- Update Transportation Plan and Transit Element

Adopt Funding Mechanisms as Warranted. As the County population increases in response to new area employment opportunities in the mining industry and elsewhere, new developers will inevitably enter the area. As this Study is being concluded, evidence that this is already taking place exists. The County and local agencies will want to consider the adoption of exactions, impact fees, and other mechanisms that enable the developers to help pay for the effect of the new residents who rent or purchase homes in their developments on the local infrastructure. The County and local agencies could adopt “Adequate Public Facilities Ordinances” to justify the use of exactions. These ordinances require that sufficient infrastructure such as roadways, utilities, schools, and so forth are provided for before additional development can take place.

Freeport-McMoRan is by far the major employer in the area. While the copper industry is unavoidably cyclical in nature, the industry’s cycles can significantly affect area planning and infrastructure. Certainly Freeport-McMoRan needs to participate in the Implementation Task Force, and frank discussions need to take place concerning options for responding to these business cycles.

8. REVENUE SOURCES

A number of funding mechanisms exist that could be used to fund multimodal improvements for the County. Key federal, state, regional, and local sources are shown in Table 41.

Funding options include both traditional and innovative sources. Traditional sources are the Arizona Highways User Revenue Fund (HURF); the Local Transportation Assistance Fund (LTAF); Federal-Aid Funds (Surface Transportation, Bridge, Safety, and Transportation Enhancement Funds); and local general funds, such as general obligation bonds and revenue bonds. Alternative sources of funding include special assessment districts, developer dedications, and exactions such as impact fees.

Greenlee County currently has two primary sources of revenue, vehicle license tax (VLT) and the highway user revenue fund (HURF). Current County revenue from these is summarized in the Arizona State Shared Revenue section of this Chapter.

FEDERAL FUNDS

The Federal government funds a variety of transportation programs, most applicable to the County would be the Surface Transportation Program (STP) funds. Arizona receives about \$152 million in STP funds per year. These funds can be used on state highways or for bridge rehabilitation, transportation enhancements, and safety projects. The County would work through ADOT and SEAGO to utilize STP funds. In addition, FHWA STP “Flex” funds can also be used for transit capital projects. The State also administers Federal Transit Administration (FTA) Section 5304, Statewide Transportation Planning Funds, Section 5310, Elderly & Persons with Disabilities Transportation Program Funds, and Section 5311, Rural Public Transportation Program Funds.

Highway Trust Fund (HTF) is composed of the Highway Account and the Mass Transit Account, and is the source of funding for most of the programs in SAFETEA-LU. Specific funding levels depend on how much revenue is generated for the Highway Trust Fund. Federal motor fuel taxes are the major source of income into the Highway Trust Fund. SAFETEA-LU allocates funding based on four major goals: improving safety, rebuilding America’s infrastructure, protecting our environment, and advancing research and technology.

Arizona has been allocated a total of \$1.57 billion between 2005 and 2007. The estimated funding levels for Arizona are summarized in Table 42 for Fiscal Years 2005 - 2006, 2006 - 2007, and 2007 - 2008. Major funding categories of federal funds in SAFETEA-LU include the following:

Surface Transportation Program federal funds are allocated to ADOT and may be programmed on any segment of the interstate system or state highway. Portions of this fund may also be used for bridge rehabilitation, transportation enhancements, and safety projects, such as hazard elimination and environmentally related activities. A new provision permits a

TABLE 41. MATRIX OF KEY FUNDING SOURCES

Fund Name	Description	Eligible Uses	Application Process	Sample Project
Federal				
STP	Federal funds, administered by FHWA and ADOT	Variety of capital projects including highways, bridges, transit and enhancement projects	Programmed and distributed through SEAGO and ADOT District	Fairgrounds entrance, highway-rail crossings
FTA Section 5310 funds	Federal funds administered by ADOT	Local jurisdictions and private non-profit agencies	Programmed through ADOT Public Transportation Division	Van for Senior Center
High Risk Rural Roads	Federal funds, administered by FHWA and ADOT	Correct safety problems on roadways classified as rural major collectors, rural minor collectors and rural local roads	Programmed through ADOT	Correct safety problems on rural roads
Safe Routes to School Program	Federal funds, administered by FHWA and ADOT	sidewalk, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, traffic diversion improvements near schools	Programmed through ADOT	Traffic calming improvement in school zone
State				
HURF	State funds, derived from fuel tax and VLT, administered by ADOT	Nearly any capital project related to roadway improvements	Funds allocated to jurisdiction as proportion of population	Improvements to County Road
LTAF	State funds derived from lottery sales	General transportation improvements	Funds allocated to jurisdiction as proportion of population	Extension of County Road
LTAF II	State funds derived from Powerball lottery sales	Used as local matching funds for FTA transit funds	Funds allocated to jurisdiction as proportion of population	Match 5311 funds for provision of dial-a-ride service
County				
Impact Fees*	Fee imposed by local jurisdiction on development on per unit basis	Used to fund a variety of infrastructure needs including transportation	Locally administered	Greenlee County Roads
Development Stipulations*	Requirements that developers dedicate appropriate ROW and build streets adjacent to project	Benefits are derived by offsetting cost of acquiring ROW and building infrastructure	Locally administered	ROW dedication adjacent to new developments

*If Enacted

TABLE 42. ESTIMATED FEDERAL AID HIGHWAY APPORTIONMENTS AND ALLOCATION FOR ARIZONA (IN MILLIONS OF DOLLARS)

Description	Estimated Apportionments		
	FY 05-06	FY 06-07	FY 07-08
Apportionments			
Surface Transportation	178.7	167.1	171.9
National Highway System	142.3	147.4	152.0
Interstate Maintenance	\$130.2	\$134.9	\$139.1
Bridge Replacement and Rehabilitation	19.4	20.1	20.7
Congestion Mitigation & Air Quality	43.7	45.3	46.7
Recreational Trails	1.3	1.6	1.7
Highway Planning and Research	10.5	10.5	10.5
Metropolitan Planning	5.7	5.7	5.8
Border Infrastructure Program	7.1	8.1	9.3
Safe Routes to School	1.6	2.1	2.6
Equity Bonus	54.4	87.2	93.9
Subtotal	\$594.9	\$630.0	\$654.2
Apportionment Distribution by Entity			
MAG	111.3	117.8	122.3
PAG	20.8	22.1	22.9
ADOT	428.9	454.2	471.7
Optional Use by MAG, PAG, Other Locals	21.4	22.7	23.6
Other Locals	12.5	13.2	13.7
Subtotal	\$594.9	\$630.0	\$654.2
Grand Total FY 06 - 08			\$1,879.1

Source: Arizona Department of Transportation, *State Transportation Improvement Plan, 2006 – 2008* Feb 2006
 Portion of State Transportation Funds are flexed to FTA for Transit projects Statewide

portion (up to 15 percent) of funds reserved for rural areas to be spent on rural minor collectors. Apportioned funds are to be distributed based on the following factors:

- 25 percent based on total lane miles of Federal-aid highways
- 40 percent based on vehicle miles traveled on lanes on Federal-aid highways
- 35 percent based on estimated tax payments attributable to highway users in the States into the Highway Account of the Highway Trust Fund (often referred to as “contributions” to the Highway Account)

Each State is to receive a minimum of one-half percent of the funds apportioned for STP.

The total funding for the STP over the three fiscal years shown in Table 42 for Arizona is \$517.7 million. Arizona’s allocation is based on the state’s lane-miles of Federal-aid highways; total vehicle-miles traveled on those Federal-aid highways, and estimated contributions to the Highway Account of the HTF.

The National Highway System (NHS) funds are for improvement to the National Highway System which consists of an interconnected system of principal arterial routes which serve major population centers, international border crossings, airports, public transportation facilities, and other intermodal transportation facilities as well as major travel destinations. The NHS funding level for Arizona over the three fiscal years as shown Table 42 is \$441.7 million. Arizona's share is based the state's lane-miles of principal arterials (excluding Interstate), vehicle-miles traveled on those arterials, diesel fuel used on the state's highways, and per capita principal arterial lane-miles.

Interstate Maintenance (IM) funds are for reconstruction of bridges, interchanges, and over crossings along existing Interstate routes, acquisition of right-of-way, and preventative maintenance. These funds are not to be used for the construction of new travel lanes other than high occupancy vehicle lanes or auxiliary lanes. The IM funding level for Arizona over the three fiscal years shown in Table 42 is \$404.2 million. The allocation of these funds is based on the state's lane-miles of Interstate routes open to traffic, vehicle-miles traveled, and contributions to the Highway Account of the Highway Trust Fund attributable to commercial vehicles. A State may transfer up to 50 percent of its IM apportionment to its NHS, STP, CMAQ, Highway Bridge Replacement and Rehabilitation, or Recreational Trails apportionment.

Bridge Replacement and Rehabilitation funds in the amount of \$60.2 million are authorized for Arizona. This allotment can be used for bridge replacement or rehabilitation for eligible bridges located on any public road. The State has the option to transfer up to 50 percent of its bridge funds to NHS or STP funds.

Congestion Mitigation & Air Quality (CMAQ) funds in the amount of \$124.5 million are allotted to Arizona between Fiscal Years 2005 and 2008 for projects likely to contribute to attainment of national ambient air quality standards and congestion mitigation. These funds are programmed for both freeway management projects, demand management projects, as well as other related air quality projects including bicycles facilities. Currently, CMAQ funds are only spent in Maricopa County.

Funds for the Recreation Trails Program is provided by the Federal Highway Administration in apportionments to the Recreational Trails Program, with an allocation of \$3.6 million over the next three years to Arizona. A state recreational trails advisory committee represents both motorized and non-motorized recreational trail users. The allocated funds are split into 30 percent for motorized use, 30 percent for non-motorized use, and 40 percent for diverse trails.

The State Planning and Research Program provides planning of future highway and local transportation systems. Research, development, and technology transfer activities necessary in connection with the planning, design, construction, and maintenance of highways, public transportation, and intermodal transportation system. Funds total \$31.5 million dollars for this effort.

Metropolitan Planning Funds in Arizona are funded with \$17.2 million over the 3-year horizon. These funds are used to carry out the planning process required by Title 23, United States Code, including the development of metropolitan area transportation plans and transportation improvement programs.

Border Infrastructure Program distributes funds among four States: Arizona, California, New Mexico, and Texas. The funds are used to support the construction and improvement to the motor carrier safety inspection facilities along the United States-Mexican border. The objective of the program is twofold: safety and the development of infrastructure to facilitate truck flow through critical commerce corridors in the four states. The money allocated for this program during the three year period is approximately \$24.5 million.

Equity Bonus ensures that the State will have a guaranteed return on its contributions to the Highway Account of the Highway Trust Fund. The specified percentages are 90.5 percent for 2005 and 2006, 91.5 percent for 2007, and 92 percent for 2008 and 2009. Arizona's State Transportation Improvement Plan estimates the amount of \$235.5 million for Fiscal Years 2006 - 2008 for the funding itself which includes an 80/20 match system. This SAFETEA-LU program replaces TEA-21's Minimum Guarantee program.

The Hazard Elimination System (HES) is a program that was previously identified as the Candidate Locations for Operations and Safety Evaluations (CLOSE) program. The primary objective of the HES program is for reducing the number and severity of traffic crashes and decreasing the potential for crashes on state highways.

Authorized funding for the HES program is under Section 924 of the Highway Safety Improvement Program of Title 23 of U.S.C. 105(f), 152, 315, and 402; Section 203 of the Highway Safety Act of 1973, as amended; 49 CFR 1.48(b). The program is funded for the amount of \$50.5 million for FYs 2003-2007 based on the ADOT Five-Year Transportation Facilities Construction Program.

Most types of public surface transportation facility improvement may be approved for funding, provided that the sole purpose of the improvement is to substantially improve safety or to eliminate traffic hazards. However, improvements primarily for capacity enhancements with safety as a by-product will not be approved.

Federal Lands Highways (FLH) funds can be used for Indian Reservation Roads, Park Roads and Parkways, Public Lands Highways, and Refuge Roads. FLH funds also can be used for transit facilities within public lands, national parks, and Indian reservations. The funds can also be used as the State/local match for most types of Federal-aid highway funded projects. Program authorizations through 2009 total \$4.5 billion for projects nationwide.

Transportation Enhancement funds are one type of federal funds, which are available directly for local projects. These funds are set aside in order to add community or environmental value to a completed or ongoing transportation project. Currently, Arizona receives about \$13.9 million per year for transportation enhancement projects that are divided between

ADOT and local government projects. The Arizona State Transportation Board retains fifty percent of the Transportation Enhancement funds for ADOT projects. The remaining enhancement funds are available for local projects recommended by the MPOs and rural councils of governments (COGs).

New SAFETEA-LU Programs

In addition to continuing the programs outlined above, SAFETEA-LU created a number of new transportation programs. Three programs of particular interest to counties are summarized below by Robert Fogel, the Senior Legislative Director for the National Association of Counties (NACo):

Highway Safety Improvement Program (HSIP) replaces the safety set-aside that was formerly part of the Surface Transportation Program. Over the next four years, an average of \$1.265 billion will be distributed by formula to the states that can be used on a broad array of safety improvement projects to reduce the number and severity of highway-related crashes and to decrease the potential for projects on all highways. That means on any road owned by county government. This includes projects aimed at intersection safety improvement, pavement and shoulder widening, rumble strips, signage, and guardrails. County officials need to get involved in this program at an early stage and document the projects they want funded. Every state is required to develop a Strategic Highway Safety Plan (SHSP) that involves a comprehensive, collaborative and data driven approach of highway safety. This plan is required to lay out projects and strategies for which the federal will be used to reduced or eliminate safety hazards. For counties, it is important to note that the SHSP must be developed in collaboration with key safety stakeholders in the State, which includes local officials, and the SHSP must be data driven. The presumption is that the federal safety funds must be invested in projects where the data (fatalities, crashes, police records, etc.) supports the need for investment.

As a part of the HSIP, there is a specific set aside for *High Risk Rural Roads*. This was a NACo priority. While any of the \$1.2 billion annually can be spent on rural roads, \$90 million is specifically targeted for safety problems on roadways classified as rural major collectors, rural minor collectors, and rural local roads. The funds can be used for construction and operational improvements related to safety but must be used on roads that have a crash rate and for fatalities and incapacitating injuries that exceeds the statewide average for those functional classes of roads. A second set aside on the HSIP program is for Railway-Highway Grade Crossing. At \$220 annually, this program is increased by approximately \$65 million beyond TEA-21 levels. This program is basically unchanged and is aimed at funding projects on any public road that eliminates hazards at rail grade crossings, including the separation or protection, reconstruction, and relocation of grade crossings.

The *Safe Routes to School Program* is a totally new program focused on enabling and encouraging children to safely walk and bicycle to school. This is another program for which counties and all the roads they own are eligible. County leaders should work vigorously to get their projects at the top of the funding list. An average of \$122 annually will be distributed by formula to each State to be used by state, counties and cities, and regional agencies, including non-profit organizations, to further this objective. Each state has to designate a coordinator for this new program, a person county officials should contact. Project eligible include sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, traffic diversion improvements near schools, and a variety of projects to encourage the use of bicycles. Each State must use between 10-30 percent of the funds for non-infrastructure related activities, such as public awareness campaigns, traffic education and enforcement near schools and student sessions on pedestrian and bicycle safety.

ARIZONA STATE SHARED REVENUE

Highway User Revenue Fund

One of the main sources of State transportation funds is the Highway User Revenue Fund. These funds are comprised of gasoline taxes, use fuel tax, motor carrier fees, vehicle license taxes, and other registration fees. The principal sources of revenue are presented in Table 43:

**TABLE 43. FY 2005 ADOT REVENUE SOURCES – STATE
(In Millions of Dollars)**

Description	FY-06 Actual
Gasoline Tax	\$ 489.1
Use Fuel Tax	213.5
Motor Carrier Fee	40.5
Vehicle License Tax	373.9
Registration	158.7
Other	55.9
Total	\$1,331.6

Source: Arizona Department of Transportation, Financial Management Services, August 2006

- Gasoline Taxes. Arizona’s motor vehicle fuel tax of 18 cents per gallon is the largest source of revenue for HURF.
- Use Fuel Taxes. Use fuel taxes are taxes on diesel fuel and range between 18 cents per gallon for passenger cars to 26 cents per gallon for commercial trucks and buses. These taxes provide the third largest source of revenue.

- Motor Carrier Fees. These fees, based on the weight of the vehicle, are the smallest source of funding for HURF.
- Vehicle License Taxes (VLT). Vehicle license taxes are linked to the value of the vehicle being taxed and are the second largest source of funds for HURF. These VLT funds are the only one of the four major HURF revenue sources that is tied to inflation and increase as vehicle prices increase. In recent years, the VLT tax rate has been reduced to be more in line with that of neighboring states.

Other fees include motor vehicle registration fees, border crossing fees, and other miscellaneous fees.

The estimated revenue for HURF in 2006 is over \$1.2 billion dollars. HURF funds are allocated through ADOT and distributed as an entitlement to cities, towns, and counties based on population. Greenlee County received \$966,223.50 of HURF funds in Fiscal 2006. As the population of the County increases, the proportion of HURF funds for the County are expected to increase as well. Table 44 lists the HURF receipts for the five most recent fiscal years.

TABLE 44. ARIZONA HIGHWAY USER REVENUE FUND DISTRIBUTIONS TO GREENLEE COUNTY AND TOWNS OF CLIFTON AND DUNCAN, FY 2002 - 2006

Jurisdiction	Distributions				
	FY 2002	FY 2003	FY 2004	FY 2005	FY2006
Total Counties in State	\$194,432,532.00	\$200,465,084.00	\$214,601,120.00	\$226,464,000.00	\$240,538,000.00
Greenlee County	654,672.78	708,991.71	803,059.82	862,297.05	966,223.50
Town of Clifton	192,166.64	186,913.29	222,868.18	38,695.75	280,559.60
Town of Duncan	60,050.09	\$58,520.21	69,681.33	74,630.43	87,794.71

Source: Arizona Department of Transportation, Financial Management Services, January 31, 2007

The HURF is the primary source for state highway funding and HURF funds are limited to highway use by the Arizona Constitution. Monies from the HURF are intended for the improvement of the State's highways and bridges. Once collected, the HURF revenues are distributed to ADOT, and in turn distributed as an entitlement share to cities, towns, and counties in proportion to population and to the Economic Strength Project Fund. HURF distributions may be used as debt service for revenue bond projects. Table 45 presents the HURF revenue forecast for FY 2006 - 2015. Table 46 presents the HURF distribution forecast for the same fiscal years.

**TABLE 45. HIGHWAY USER REVENUE FUND REVENUE FORECAST
(IN MILLIONS OF DOLLARS)**

Fiscal Year	Gasoline	Use Fuel	Motor Carrier	VLT	Registration	Other	HURF Total
2006	\$497.20	\$205.00	\$40.30	\$350.30	\$160.30	\$53.20	\$1,306.30
2007	528.8	211	39.7	378.9	162.3	54.4	1,375.10
2008	550.5	218.9	40.8	409.3	167.1	56.7	1,443.30
2009	572.3	226.7	42	441.5	171.8	59	1,513.30
2010	594.6	234.2	43.3	474.5	176.9	61.3	1,584.80
2011	616.4	241.9	45	510.9	182.7	63.7	1,660.60
2012	639.7	249.8	46.9	550.4	189	66.2	1,742.00
2013	663.9	258.3	48.9	592.5	195.4	68.9	1,827.90
2014	689.8	267.1	51.3	637.9	202.7	71.7	1,920.50
2015	717.8	276.8	53.6	688.7	210.2	74.6	2,021.70

Source: Arizona Department of Transportation, Financial Management Services, May 17, 2006

**TABLE 46. HIGHWAY USER REVENUE FUND DISTRIBUTION FORECAST
(IN MILLIONS OF DOLLARS)**

Fiscal Year	Forecast Distribution							
	HURF	DPS/ESP	Net HURF	ADOT 50.5%		Cities/Towns 27.5%	Cities Over 300k 3%	Counties 19%
				ADOT	DPS Parity			
2006	\$1,306.30	\$64.80	\$1,241.50	\$624.30	\$2.70	\$341.40	\$37.20	\$235.90
2007	1,375.10	11	1,364.10	686	2.9	375.1	40.9	259.2
2008	1,443.30	11	1,432.30	720.2	3.1	393.9	43	272.1
2009	1,513.30	11	1,502.30	755.3	3.4	413.1	45.1	285.4
2010	1,584.80	11	1,573.80	791.2	3.6	432.8	47.2	299
2011	1,660.60	11	1,649.60	829.2	3.9	453.6	49.5	313.4
2012	1,742.00	11	1,731.00	870	4.2	476	51.9	328.9
2013	1,827.90	11	1,816.90	913	4.5	499.6	54.5	345.2
2014	1,920.50	11	1,909.50	959.4	4.9	525.1	57.3	362.8
2015	2,021.70	11	2,010.70	1,010.20	5.3	552.9	60.3	382

Source: Arizona Department of Transportation, Financial Management Services, May 17, 2006

Local Transportation Assistance Fund (LTAF I and LTAF II)

Other State funding programs include LTAF I, which is funded by Arizona Lottery receipts other than Powerball, and LTAF II, which is funded by Powerball receipts. These funds are also distributed based on population. Larger cities, those over 300,000, must use LTAF I revenue for public transit; smaller communities can use the funds for other transportation projects. LTAF II monies must be used for transit by nearly all jurisdictions.

Local Transportation Assistance Fund. The LTAF is funded by the Arizona Lottery for use by cities and towns requesting the funds. The LTAF funds are allocated in proportion to the relative population of all Arizona cities and towns. Each requesting municipality is guaranteed a minimum of ten thousand dollars. Currently, \$23 million may be deposited in the LTAF from the State lottery fund each fiscal year. Cities and towns with a population of more than 300,000 persons must use LTAF funds for public transportation. In addition, up to 10 percent of funds may be used for the arts, or for disabled and handicapped assistance.

The Local Transportation Assistance Fund II, or LTAF II, program, which derives funds from the State’s share of lottery “Power Ball” ticket receipts, has been one of the key sources for the local matching funds for these federal funds. Since the implementation of LTAF II, the legislature has provided that when these receipts reach a certain threshold amount in any fiscal year, the balance flows to the LTAF II program for apportioned distribution to councils of governments, county governments, and local governments. Fiscal year 2008 LTAF II distributions in Greenlee County are shown in Table 47. The projected 2008 distribution is lower than that received in the previous fiscal year—an example of the challenges in relying on this source of funding.

**TABLE 47. LTAF II DISTRIBUTION - COUNTIES AND CITIES/TOWNS
FY 2008**

Jurisdiction	County Level Distribution	Jurisdiction Level Distribution
Greenlee County	\$13,295.35	\$8,033.28
Town of Clifton		\$3,980.60
Town of Duncan		\$1,281.48

Source: Arizona Department of Transportation, Public Transportation Division

Arizona State Parks Heritage Fund

The LRSP Heritage Fund provides funding assistance to local agencies for park development, outdoor recreation, and open space projects. The State Parks Board receives up to \$3.5 million each year from the Arizona Lottery. Grants are awarded on a 50/50 match basis. Matching funds can be in the form of cash, in-kind contributions, or donations. Such funds could be used for enhancements to the City’s proposed trail system. Table 48 lists the four Historic Preservation grants provided for projects in Greenlee County.

Off-Highway Vehicle Recreation Fund

The Off-Highway Vehicle Recreation Fund receives fifty-five one hundredths of one percent (0.55%) of the total license tax on motor fuel received by the State for the HURF. On a monthly basis, 70 percent of the OHV Recreation Fund is distributed to the State Parks Department, and 30 percent of the Fund is distributed to the Game and Fish Department.

**TABLE 48. HERITAGE FUND HISTORIC PRESERVATION GRANT AWARDS
IN GREENLEE COUNTY**

Participant	Project Title	Grant Cycle	Grant Award	Project Cost
Clifton	Clifton Preservation Plan	1997	\$10,000	\$18,000
Clifton	Southern Pacific Train Station Rehabilitation	1992	\$11,180	\$22,360
Greenlee County	Gila River Bridge Stabilization	1992	\$10,780	\$21,560
Greenlee County Historical Society	Eagles' Hall Restoration	1992	\$6,650	\$13,300

Source: Arizona State Parks

The OHV Recreation Fund monies are to be used for:

- Designation, construction, and maintenance of OHV recreational facilities, OHV use areas, and OHV trails under the jurisdiction of either the State Parks Department or the Game and Fish Department
- Enforcement of off-highway vehicle laws
- Mitigation of damages to land
- OHV-related environmental education

OTHER FUNDING SOURCES

Public Transit

Significant federal sources of funding grants are overseen and managed by the FTA; these funds are administered in Arizona by the Public Transportation Division of ADOT (ADOT PTD). FTA funding levels are part of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the successor to the Transportation Equity Act for the 21st Century (TEA-21). The federal transit laws are contained in Title 49 of the United States Code (USC), Chapter 53. The key transit grant provisions applicable to Greenlee County are covered in the following sections of Chapter 53 of the USC:

- Section 5310: Formula Grants for Special Needs of Elderly Individuals and Individuals with Disabilities
- Section 5311: Formula Grants for rural and small urban public transportation
- Section 5313: State Planning and Research Programs

The ADOT PTD has recently adopted a policy providing that, on a case-by-case basis, a private sector non-profit agency may be the recipient of Section 5311 funds. Previously, public agencies were the only agencies considered for these grants. Hence, more management options exist for the operation of Section 5311 supported transit services.

Surface Transportation Program Flexible Funding

Since 2000, the State Transportation Board has made available 6.5 million annually in STP “flexible funds” statewide for qualified transit capital projects such as vehicles and transit facilities. These funds, created within the federal TEA-21 program and continued under SAFETEA-LU, are regarded as “flexible” in that the monies may be used for either highway or transit purposes. Funding originates with the Federal Highway Administration and is administered by ADOT.

Additional sources of revenue available for transit services include the following:

- Welfare to Work Act
- Older American Act Title III funds, Department of Economic Security
- Division of Developmental Disability funds
- Transportation funding through Medicaid administered through the Arizona Health Care Cost Containment System
- Head Start, Behavioral Health Funding
- Transit fares

Economic Strength Projects Fund

Local governments are eligible sponsors and co-sponsors of transportation projects financed by the Arizona Economic Strength Projects fund. This fund is sponsored by the Arizona Department of Commerce and funded by HURF. A local match must provide at least 10 percent of the project cost. The fund finances selected road projects that support economic development objectives.

Governor’s Office of Highway Safety

Federal funds are allocated to finance state and local government highway safety projects. These program funds, in the form of reimbursable contracts, are administered by the Governor’s Office of Highway Safety. Funds are provided under the National Highway Safety Act and funded through grants from the FHWA and the National Highway Traffic Safety Administration (NHSTA). The safety priority areas are listed below:

NHSTA Priority Program areas:

- Police traffic services
- Impaired driving
- Traffic records
- Pedestrian/bicycle safety
- Emergency medical services
- Occupant protection
- Motorcycle safety

FHWA Priority Program areas:

- Corridor safety improvement programs
- Safety studies of specific safety problems
- Outreach programs
- Rural and local technical assistance programs
- Pedestrian and bicycle safety
- Safety management systems

Pedestrian/Bicyclist Funding

Revenue sources for bicycle facilities primarily for transportation are available from the following sources:

- Federal funds are available to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the NHS.
- Federal Lands Highway Funds are available to construct bicycle facilities and pedestrian walkways in connection with roads, highways, and parkways. These funds are at the discretion of the department administering the funds.

Other funds for bicycle and pedestrian facilities are:

- National Recreational Trails Fund, which provides funds for recreational programs for bicyclists and pedestrians.
- Scenic Byways Program can fund bicycle facilities along highways.
- Federal Transit Funds can be used to provide bicycle and pedestrian access to transit facilities including shelters and bicycle parking facilities.
- Additional funding is available through the new “Safe Routes to Schools” program explained in the previous section.

Another potential funding source for trails is the Heritage Fund. The Arizona State Parks Board Heritage Fund legislation stipulated the use of Arizona Lottery Fund revenues for trails. Eligible projects are trail land acquisition, design, engineering, development and renovation activities, and trail support facilities.

Community Development Block Grants

Community Development Block Grant (CDBG) is funds provided by the Federal Office of Housing and Urban Development. The CDBG funds can be used in the construction of capital improvement projects such as sewer, streets, water and wastewater treatment plants, housing,

and parks that benefit low to medium income groups. Projects that alleviate slums or address an urgent need such as circumstances caused by a natural disaster can also use CDBG funds. For a transportation improvement to be eligible for CDBG funding, the project must be located in a census tract or block group with at least 51 percent of the population in the low and moderate-income group.

Regional and Local Funds

Several potential sources of additional funding exist at the local level. State law provides for the enacting of transportation excise taxes, which are subject to voter approval. Other local funds could be collected through sales tax increases.

Private Contributions

Developers may be required to help pay for the cost of transportation improvements necessitated by their developments. This requires a Traffic Impact Analysis to demonstrate that substantial additional traffic will be generated by the development. Several institutional mechanisms are available, including cost sharing agreements, impact fees and special assessments. In cases where right-of-way needed for a roadway is privately owned, right-of-way dedications can be made a condition of new development prior to the issuance of the necessary permits.

Table 49 summarizes the different types of developer exactions that are commonly employed.

TABLE 49. TYPES OF EXACTIONS AND POTENTIAL BENEFITS

Exaction Category	Examples	Potential Benefits
Infrastructure Exaction	<ul style="list-style-type: none"> • Dedication of land for park • Construction of roads to serve new housing development • School construction 	<ul style="list-style-type: none"> • Recreational amenity for residents • New development pays own way; city funds freed up to maintain existing roadways • Expands capacity to serve new residents, reducing potential overcrowding at existing schools
Impact Fees	<ul style="list-style-type: none"> • Funding for affordable housing, childcare, schools, and other needs. 	<ul style="list-style-type: none"> • Resources obtained to offset social and economic impacts of new development
Community Benefits	<ul style="list-style-type: none"> • Development agreement 	<ul style="list-style-type: none"> • Developer commits to local hiring and living wage jobs. • Developer constructs affordable housing off site. • Developer pays for traffic mitigation/traffic calming measures. • Developer funds job training programs.

Source: www.policylink.org/EDTK/Exactions/#2

REVENUE ESTIMATES

The 2001 Governor's Transportation Vision 21 Task Force Report estimated that \$41 billion from existing sources of transportation related revenue in Arizona will be received between 2000 and 2020. Of this amount, \$33,783.8 billion is roadway related, \$4,106.1 is derived from transit related sources, and \$3,164.3 from aviation. The comparison of needs and revenues is shown in Table 50.

**TABLE 50. COMPARISON OF NEEDS AND REVENUES STATEWIDE
(IN MILLIONS OF CONSTANT 2000 DOLLARS)**

Sources	Use	FY 2001- 2005	FY 2006- 2010	FY 2011- 2015	FY 2016- 2020	Total
Revenue From Existing Sources	Roadway	\$7,955.1	\$8,432.6	\$8,580.1	\$8,816.0	\$33,783.8
	Transit	\$1,133.3	\$1,050.9	\$986.8	\$935.1	\$4,106.1
	Aviation	\$846.7	\$795.5	\$771.0	\$751.1	\$3,164.3
	Total Revenue	\$9,935.1	\$10,279.0	\$10,337.9	\$10,502.3	\$41,054.3
Needs	Roadway	\$12,601.0	\$12,601.0	\$12,601.0	\$12,601.0	\$50,404.0
	Transit	\$1,705.0	\$1,705.0	\$1,705.0	\$1,705.0	\$6,820.0
	Aviation	\$1,027.8	\$1,027.8	\$1,027.8	\$1,027.8	\$4,111.0
	Total Needs	\$15,333.8	\$15,333.8	\$15,333.8	\$15,333.8	\$61,335.0
Additional Revenue Required to Meet Needs	Roadway	\$4,645.9	\$4,168.4	\$4,020.9	\$3,785.0	\$16,620.2
	Transit	\$571.7	\$654.1	\$718.2	\$769.9	\$2,713.9
	Aviation	\$181.0	\$232.3	\$256.8	\$276.6	\$946.7
	Total Additional Revenue Required	\$5,398.6	\$5,054.8	\$4,995.9	\$4,831.4	\$20,280.7

Source: *Revenue Consultant Report to Governor's Transportation Vision 21 Task Force*, Wilbur Smith Associates, November 2001

ADOT's Five-year Transportation Facilities Construction Program

Table 51 lists ADOT's *Five-year Transportation Facilities Construction Program* allocations for the five-year period covering Fiscal Years 2005 through 2009. For this period, ADOT has allocated a total of \$764 million for highway system preservation, \$2.7 billion for system improvements, and \$354 million for system management for a total of \$3.78 billion.

**TABLE 51. ADOT FIVE-YEAR TRANSPORTATION FACILITIES CONSTRUCTION
PROGRAM RESOURCE ALLOCATIONS
(In Thousands of Dollars)**

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total
System Preservation	\$149,800	\$152,148	\$155,718	\$153,190	\$153,290	\$764,146
System Management	\$76,727	\$70,393	\$68,818	\$68,818	\$68,878	\$353,634
System Improvements	\$863,672	\$730,090	\$377,388	\$377,181	\$320,863	\$2,669,194
Total Resource Allocations	\$1,090,199	\$952,631	\$601,924	\$599,189	\$543,031	\$3,786,974

Source: Arizona Department of Transportation, *Five-year Transportation Facilities Construction Program*

The five-year program also includes an allocation for District minor projects that is used by the ADOT Districts for minor improvement projects such pavement widening, shoulders, guardrail, drainage improvements, intersection improvements, and other minor improvements. The total five year allocation in the FY 2005 – 2009 Program for District minor projects is approximately \$104 million, approximately \$10 million per District.

9. COUNTY ROAD STANDARDS AND ACCESS MANAGEMENT

The purpose of this chapter is to recommend County road standards on which to base programmed improvements and to provide an overview of recommended practices for the management of vehicular access to all County-owned roadways.

The consultant recommends that Greenlee County revise County road standards based on those adopted and revised by Cochise County as appropriate. According to the Arizona Department of Economic Security, Cochise County has an estimated population of over 135,000. Cochise County is also bisected by Interstate 10 and the mainline of the Union Pacific Railroad. Hence, not all of the Cochise standards are needed or even desirable for Greenlee County, which has a much smaller population and is more rural in nature. This chapter presents roadway criteria that may be suitable for Greenlee County and depicts some cross-sections adopted from the Cochise County standards for the roadways most likely to be constructed or reconstructed by the County in the near term.

ROADWAY CRITERIA

Table 52 summarizes the characteristics of the three basic types of roadways, local, collector, and arterial. In larger jurisdictions, these are commonly broken down further into minor and major collectors and minor and major arterials. In addition, both rural and urban designs for each functional class of roadway are provided.

The most obvious differences between rural and urban roadways concern the ways in which drainage is handled. Rural roads usually have bar ditches on one or both sides of the roadway that conduct runoff to a natural watercourse or a cross drain culvert to keep water from accumulating on the surface of the roadway. Urban roadways assume the existence of some sort of infrastructure to handle water runoff, such as storm drains and sewers. In some cases, gutters perform the same role performed by the ditches in rural roads, conducting the water to a cross drain or stream where it can be disposed of.

Another key difference between rural and urban roadways is the manner in which non-motorized travel is handled. Rural roads have gravel or unimproved shoulders that equestrians and pedestrians use, while bicyclists ride in the travel lanes. On busier urban streets, special lanes are striped for use by bike riders, and sidewalks are provided for pedestrians.

Access management techniques are useful for maximizing the intended functions of the different functional classes of roadways and are discussed in detail in the following chapter.

TABLE 52. SUGGESTED CLASSIFICATION FOR GREENLEE COUNTY ROADS

	Local	Collector	Arterial
Function	Traffic movement secondary consideration	Traffic movement equal consideration with access	Traffic movement primary consideration
Land service/access	Land access primary consideration	Traffic movement equal consideration with land access	Land access secondary consideration
Traffic volume (veh/day typical)	< 1,000	< 5,000	> 5,000
Flow characteristics	Interrupted flow	Interrupted flow	Free flow except at signals
Design speed (mph)	35 - 50	50 - 60	50 - 60
Posted speed (mph)	25 - 45	35 - 50	35 - 50
Vehicle type	Passenger and service vehicles	Passenger and service vehicles	All types, truck route
Desirable connections	Other local and collectors	Locals, collectors and arterials	Collectors, arterials, State highways
Accommodation of cyclists	No restrictions or special facilities	No restrictions or special facilities	Wider lanes or special facilities desirable, where required
Accommodation of pedestrians	Pedestrians permitted, no special facilities	Pedestrians permitted, no special facilities	Pedestrians permitted, no special facilities
Parking (typical)	Prohibited	Prohibited	Prohibited
Minimum intersection spacing	See Chapter 7	See Chapter 7	See Chapter 7
Right-of-way width in feet (typical)		100	
Traffic calming	Not applicable	Not applicable	Not applicable

Sources: City of Hamilton, Ontario, *Rural Road Standards Policy Paper*, January 2005, Cochise County Road Design Construction Standards, Revised October 11, 2005

EXAMPLE ROADWAY CROSS-SECTIONS

Local and collector roads are the two most likely types of County roadways. In the near term, the functions of arterials in Greenlee County are performed by the US and State Highways. Figures 25, 26, and 27 depict cross-sections of local and collector roads. Each type of cross-section is assigned a code beginning with “GC” that was referred to in Chapter 6.

DEFINITION OF ACCESS MANAGEMENT

Access management is defined as the regulation of vehicular access to public roadways from adjoining property. Access management is provided through legal, administrative, and technical strategies available to a political jurisdiction under its police powers in order to maintain the health, safety, and welfare of the jurisdiction's residents. Access management regulates the level of access control on roadways and is needed to help retain the capacity of public highways, access to private land, and maintain public safety.

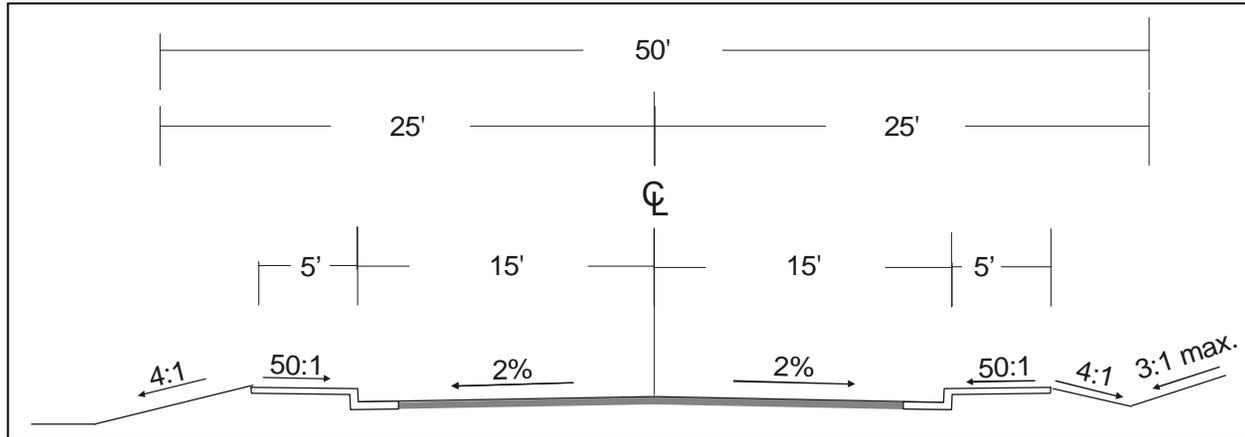
In general, property owners have a right of reasonable access to an adjacent roadway. However, governments may restrict the use of private property to protect or advance the public safety and general welfare to prevent public injury or where demanded by public interest. Private rights of abutting landowners to access their property are generally subservient to the rights of the public to free and safe use of the public street system.

Different types of roadways are administered by different entities, such as the State, a municipality, or a county. The land use decisions made by the local jurisdiction a roadway is passing through will influence the functionality of that particular roadway. An example is the functionality of US 191, which is administered by ADOT. The functionality is very much dependent on the land use decisions made by Somerton. Therefore, all jurisdictions responsible for transportation systems and land use planning should be aware of this particular relationship and adopt formal access management guidelines. These may be published as a separate document, contained in zoning codes, established in roadway planning and development procedures, or in some combination. The implementation of the guidelines or regulations should be a shared responsibility of both the planning and engineering departments. The regulations should be approved by the jurisdiction's elected body and be readily available for use by developers, real estate agents, and the general public.

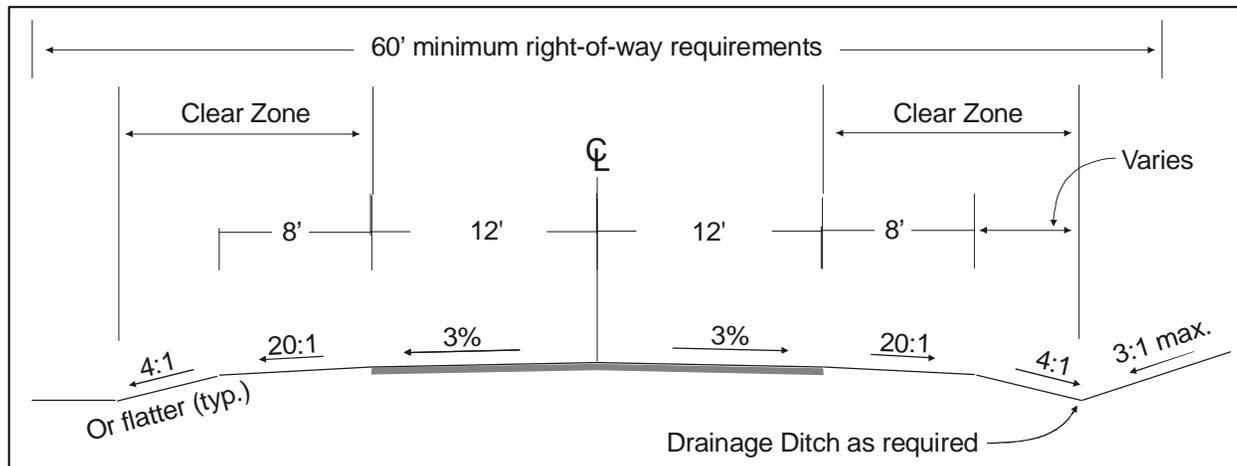
The guidelines presented in this section provide basic design criteria for the location, spacing, and geometric aspects of roads and driveways. The guidelines are intended for use in investment decisions by land developers, for site planning, and for facility design. Availability of the guidelines reduces project review and approval time, as well as assuring that adequate access is available to serve a proposed land use.

FIGURE 25. LOCAL ROADWAY CROSS-SECTIONS

Urban Local Road - GCUL2



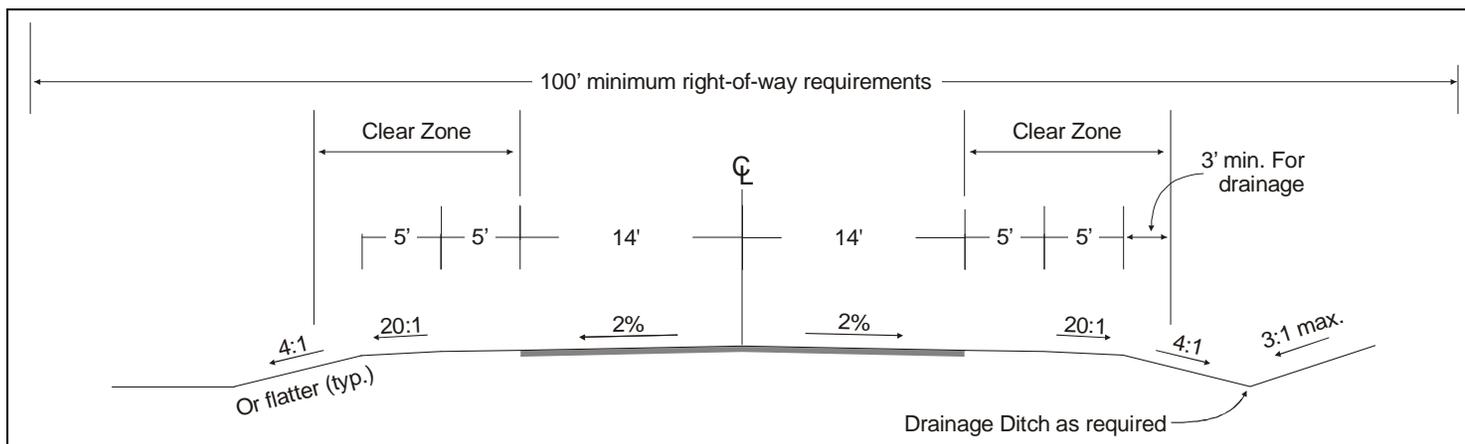
Rural Local Road - GCRL2



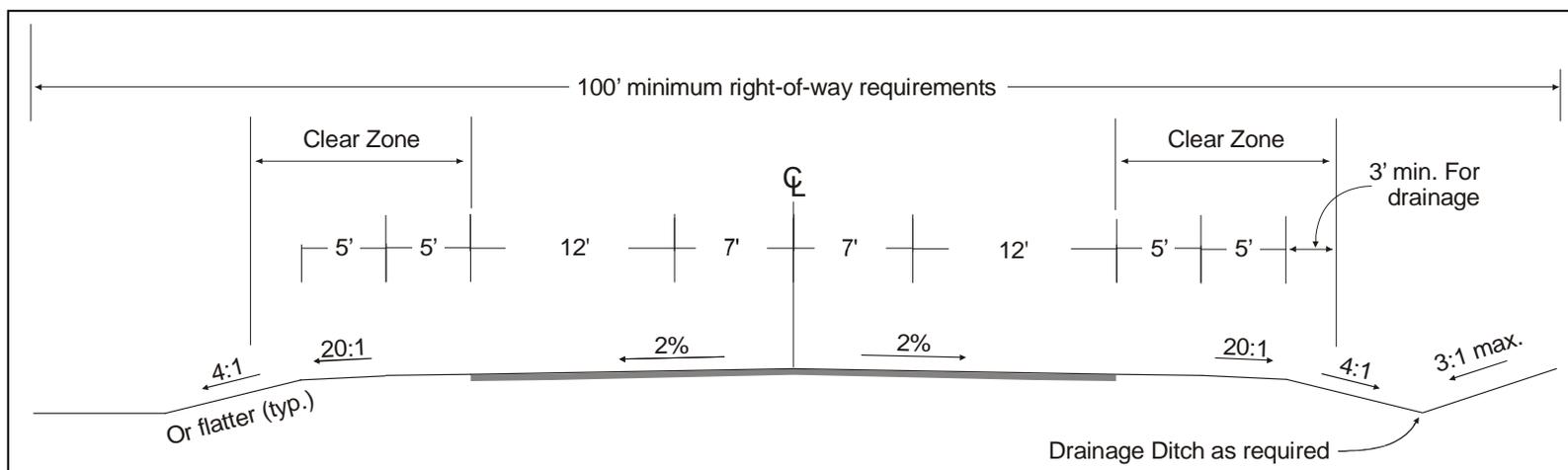
Source: Cochise County Road Design Construction Standards, Revised October 11, 2005

FIGURE 26. RURAL COLLECTOR ROADWAY CROSS-SECTIONS

Without Center Turn Lane – GCRC2



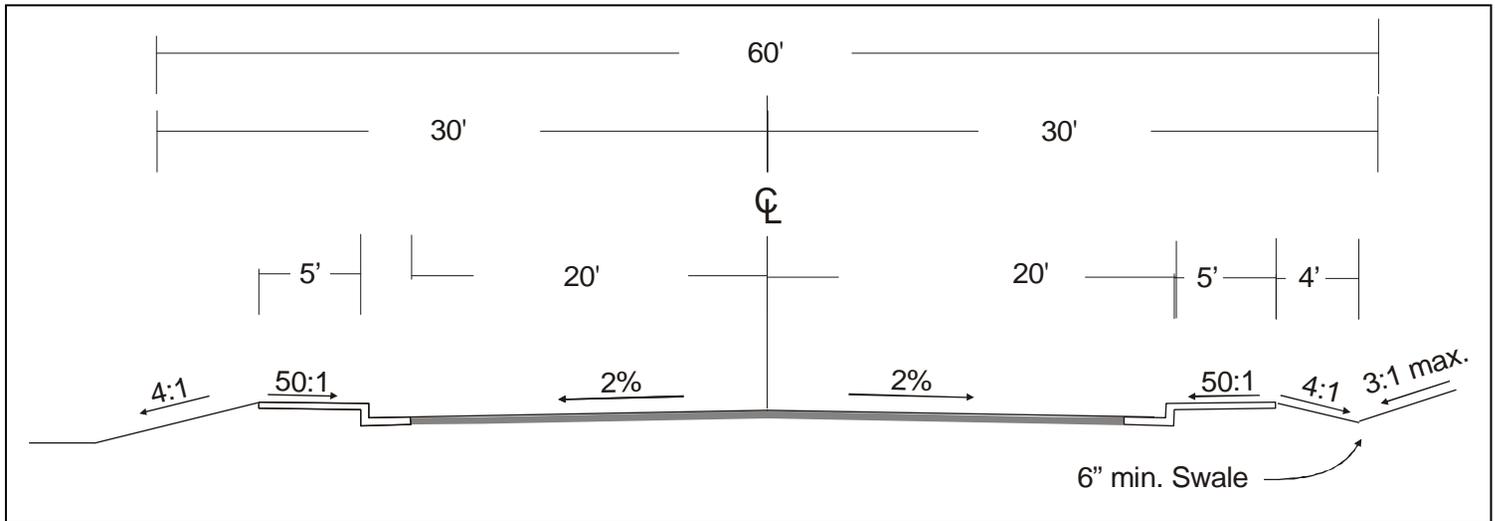
With Center Turn Lane – GCRC3



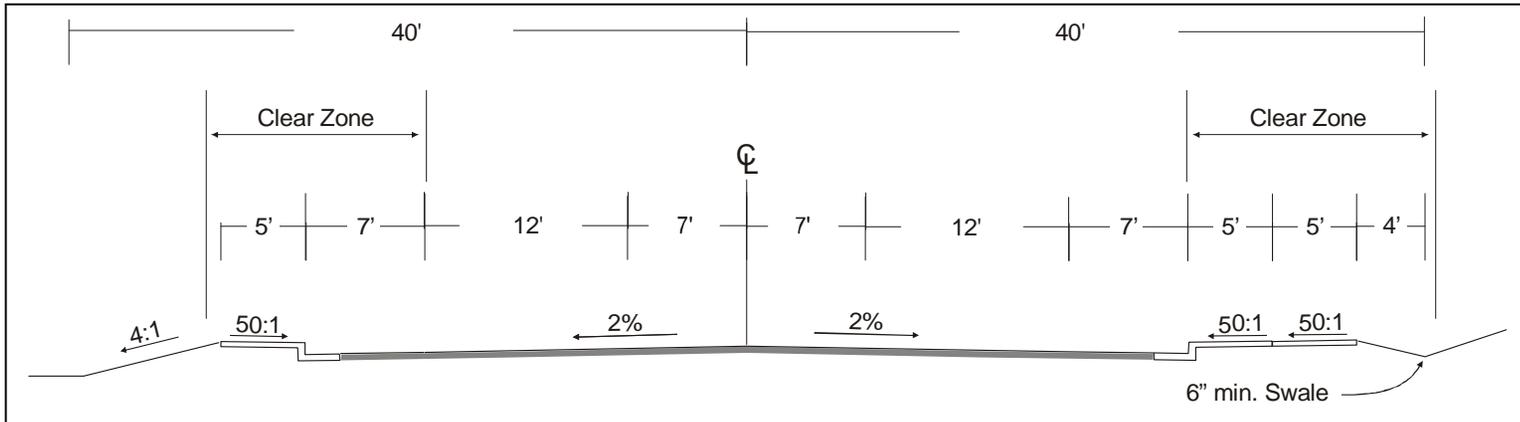
Source: Cochise County Road Design Construction Standards, Revised October 11, 2005

FIGURE 27. URBAN COLLECTOR ROADWAY CROSS-SECTIONS

Urban Minor Collector without Center Turn Lane - GCUC2



Urban Major Collector with Center Turn Lane - GCUC3



Source: Cochise County Road Design Construction Standards, Revised October 11, 2005

LEGAL ISSUES OF ACCESS CONTROL

This section presents an overview of legal issues in regard to access control. The discussion is based on a review of Arizona Revised Statutes and on a 1990 ADOT report entitled *Access Management: Practices in Other States and Improvement for Arizona*. Access rights are property rights protected by the U.S. Constitution as well as the Arizona State Constitution. According to the Arizona Constitution (Article 2, Section 17) “no property shall be taken or damaged for public or private use without just compensation...” An owner of a property abutting a public highway has a private right or easement for the purpose of ingress and egress to and from his property. This easement may not be taken or substantially impaired without compensation. However, property right of access is not an absolute right and is subject to the public’s right of passage.

All private property rights, including access rights, are susceptible to condemnation through the State’s power of eminent domain. Access rights are also always subject to reasonable regulation through police powers of local governments and the state for the public health, safety, and welfare. The right of access is a right of reasonable access and is not a private right of direct access. However, once a direct access has been provided to a non-controlled access highway the property owner has an access easement. Any destruction or unreasonable restriction of that access requires compensation. The landowner must retain reasonable access that is access suitable for the highest and best use of the property.

Local governments and the state have the power to regulate traffic on the highway including the following:

- Curbing highways and restricting driveway location, spacing, size, and design
- Regulating traffic flow
- Determining the types of vehicles that may use a highway
- Restricting traffic movement to one direction of travel
- Striping a highway or constructing a median divider which permanently limits property ingress and egress to one direction of travel

Local governments and the state may close direct access to a property and provide alternative indirect access via a frontage road or another public road abutting the property. If the indirect access provides reasonable access for the highest and best use of the property, the owner is not entitled to damages. Also, the property owner is not necessarily due compensation even if the access is more circuitous unless the property owner suffers a unique injury.

BENEFITS OF ACCESS MANAGEMENT

Benefits of access management have been documented in the technical literature including, the Transportation Research Board *Access Management Manual* and the *Access Management Awareness Program: Phase II Report*, December 1997, Iowa State University. Benefits of access management documented by these two reports include the following:

- Access management leads to a reduction in annual accidents and depending on the access management techniques implemented this reduction could be significant.
- Access management improves the level of traffic service to motorists at peak hour and increases operating speeds.
- Access management projects according to the 1997 study generally do not have an adverse effect on the majority of businesses.
- Ninety to 100 percent of motorists surveyed in the 1997 Iowa study reported a favorable opinion of improvements made to roadways that involve access management.

ACCESS MANAGEMENT STRATEGIES AND TECHNIQUES

Access can be controlled through the use of planning and regulatory tools and through the implementation of technical methods.

Planning and Regulatory Tools

The following are planning and regulatory tools that are available to the County to control access to properties.

1. Land Division. Controlling lot dimensions has an impact on driveway spacing, on-site circulation, and driveway lengths. Lot dimensions can be controlled through minimum lot size, minimum lot frontage, set back requirements, etc.
2. Subdivision Regulation. The following procedures and regulations are access management techniques.
 - a.) *Site Review Process.* The site plan review process can require documentation of all access points. Traffic signals, medians and on-site circulation controls can be required to ensure that standards are followed.
 - b.) *Regulating Lot Splits and Further Subdivisions.* Various types of lot configurations encourage inadequate spacing between access points. The regulation of lot splits by jurisdictions could help to ensure increased spacing between access points.
 - c.) *Subdivision Regulation.* Regulations could orient lots and access points to local streets away from the high traffic volume arterials.
3. Access Controls. Access to properties can be regulated through the following controls:
 - a.) *Location and Design.* Control the number of access points in relation to road deceleration and acceleration lanes to avoid conflict points. Provide adequate design of driveway throat length to avoid a conflict with flow of off-site traffic. Provide adequate driveway spacing requirements, corner clearance, and joint and cross access configurations.

- b.) *Retrofitting Non-Conforming Access.* Require conformance to access control guidelines with new permit requests for new driveways, land use intensity changes, and site improvements.
4. Zoning Regulations. Zoning techniques can be used to regulate access such as:
 - a.) *Overlay Zoning.* Standards can be tailored by priority or intensity access, safety, and congestion problems with corridor overlays for access control problem areas.
 - b.) *Flexible Zoning.* Flexible zoning can allow for alternative site design, buffering, and screening between incompatible uses.

Access Management Projects

Projects to control access include: driveway consolidation, provision of adequate corner clearance, implementation of two-way continuous left-turn lanes, construction of frontage roads, and construction of a raised median. These techniques are desirable below:

1. Driveway Consolidation. Driveways are consolidated to limit the number of driveways per mile along a road and provide adequate spacing between driveways in order to reduce the number of conflicts.
2. Corner Clearance. This type of project involves providing adequate corner clearance by keeping or moving driveway entrances away from intersections. Improving corner clearance reduces conflicts that cause read-end accidents. In some cases driveways are moved from the main streets to side streets to clear corners.
3. Continuous Two-way Left Turn Lanes. An additional dedicated left-turn lane is provided in the center of the street to separate left-turning traffic from through traffic. Generally, these left-turn lanes are used where moderate levels of turns occur.
4. Alternative Access Ways (Frontage and Backage Roads). Access is provided to sites adjoining the main road by either frontage or backage roads. These roads separate turning movements from the through traffic on the main road.
5. Raised Medians at Intersections. Raised medians at intersections provide a center barrier near intersections to prevent some turning movements into driveways near the intersection. This reduces conflicts near the intersection.
6. Full Raised Medians. Full raised medians are barriers the full length of the main roadway that prevent both left turns and cross traffic. Full raised medians eliminate conflict points along the stretch of the median where traffic volumes are high.

RECOMMENDED ACCESS MANAGEMENT GUIDELINES

The County should form an internal access management team to formalize a continuous access management process including: 1) the access permitting procedures; 2) identifying responsibilities; 3) reviewing development plans; 4) coordinating on planning new and relocated roadways; and preparing Access Management Plans. For State Highways, a joint partnership on access control between ADOT and the Greenlee County will ensure that the interests of both agencies are maintained while managing access using the state and local powers to control access. Therefore, it is imperative that the County establishes an ongoing process in cooperation with ADOT to coordinate zoning and subdivision approval with ADOT's access permitting process.

The general policies of the Access Management Guidelines are as follows:

- Traffic signals will only be installed at major intersections when warranted in accordance to the *Manual on Uniform Traffic Control Devices*.
- Left- and right-turn lanes should be provided on all approaches to major intersections. Left-turn lanes should be provided on all approaches to intermediate intersections. Right-turn lanes should be provided where warranted by projected traffic demands at arterial-collector and arterial-local intersections.
- The collector street network should provide access to arterial streets with intersections on State Highways as part of land use development.
- Existing driveway access points should be eliminated or consolidated as redevelopment occurs.
- Any median openings along State Highways would have to be applied for through the ADOT Regional Traffic Engineer.

Access Management on State Highways

The police power to grant or deny access to State Highways rests with ADOT's District Engineer. Thus, the district should be brought into any discussion of new access to the highway early in the development process. Moreover, it is important that coordination with ADOT and the County be established to ensure that interests of both agencies are maintained. The following access application procedures are to be followed:

- The County informs ADOT of pending developments as soon as possible. This should occur through written notification to the District Engineer.
- ADOT and the County coordinate and agree on the access which will be allowed. Department staff should attend regular meetings that may have any traffic impacts regarding state routes through the County.

- Following ADOT Traffic Impact Study guidelines, a traffic impact study is prepared by the developer. In addition to the information required under the guidelines the impact study should include the type of access requested relative to the allowable access, the type of proposed traffic control, the distance to the nearest intersection on state routes in both directions, and alternative access available, and the need.
- The ADOT District Permits Engineer, in coordination with the ADOT Regional Traffic Engineer, and local government, approves or denies access.

Access Management Plans

Access management plans should be prepared on selected County roadways and for state routes. These plans should include:

- An introduction defining the study corridor and discussing the purpose of the access management plan.
- An existing conditions section presenting traffic and geometric conditions on the highway under evaluation.
- A specific access management plan including signal locations, driveway access policies, median type and location, and median break spacing. The plan should be presented in both tabular form and on aerial photos.
- An implementation section outlining how the access management plan will be carried out including responsibilities and intergovernmental cooperation.
- A procedure to adopt the access management plans including how the plans can be updated.

The access management plans should also include a comprehensive review of existing driveways to identify driveways which have not been permitted and driveways which can be consolidated as redevelopment occurs. Those driveways which have not been permitted should be closed by the County and ADOT for County roadways and State routes, respectively.

Land Use and Local Access

The County should use its zoning and subdivision powers to influence the location and design of access to the state routes. The concept for access to adjacent properties in regard to how these properties currently access County roads to state routes and how they can access the highway in the future should be carefully reviewed. A critical issue will be whether to maintain existing access points or relocate access points. The concept of relocating some existing access points to maintain a minimum spacing between access points must be carefully examined in order to ensure that property rights are upheld.

Recommended Intersection and Driveway Spacing Practice

Access management practices include intersection and driveway spacing minimums for major arterial, minor arterial, and collector streets. These standards include all functional classification system roadways as defined by this Plan. Table 53 presents minimum access spacing standards for intersections and driveways. Tables 54 and 54 present guidelines for spacing median openings and driveway spacing, respectively.

TABLE 53. MINIMUM ACCESS SPACING STANDARDS

Roadway Category	Speed	Public Road Spacing	Private Direct Access	Private Access Spacing	Private Access Geometrics	Private Access Remarks
Regional Highways	35-45 mph	0.2 mile	Limited	Based on	Based on special	Allowed only when no other access is available.
	50-60 mph	0.5 mile	Limited	special	circumstances	
	65 + mph	1 mile	Limited	circumstances		
Rural Highways	35-45 mph	660 feet	Allowed	250 feet min.	Right turns	One access per parcel, two large development when spacing standards can be met.
	50-60 mph	0.25 mile	Allowed	450 feet min.	allowed, turn	
	65 + mph	0.50 mile	Allowed	1000 feet min.	lanes may be required.	
Principal Arterial I	50-55 mph	0.50 mile	Limited	600 feet min.	Right turns only	Allowed only when no other access is available.
	60-70 mph	1 mile	Limited	1200 feet min.	allowed, turn lanes may be required.	
Minor Arterials	35-45 mph	0.25 mile	Limited	250 feet min.	Right turns	One access per parcel, two for large development when spacing standards can be met.
	50-55 mph	0.50 mile	Limited	450 feet min.	allowed, turn lanes may be required.	
Collector Roads	25-35 mph	660 feet	Allowed	150 feet min.	Right turns	One per parcel.
	40-45 mph	0.25 mile	Allowed	300 feet min.	allowed, turn lanes may be required.	

Source: Nevada Draft Access Management System and Standards

TABLE 54. GUIDELINES FOR SPACING MEDIAN OPENINGS

Street Functional Classification	Spacing of Median Openings (feet)		
	Urban	Suburban	Rural
Arterial	660	660	1,320
Collector	330	660	1,320

Source: City of Tucson: Access Management Guidelines for the City of Tucson

TABLE 55. PROPOSED SPACING FOR DRIVEWAYS

85th Percentile Speed (mph)	Minimum Separation (feet)
25	150
30	200
35	250
40	300
45	350
50	450
55	600
60	800
65	1,000
70	1,200

Source: Nevada Draft Access Management System and Standards

In addition to guidelines for driveway spacing, a new driveway or a driveway with changed access should **not** be allowed under the following conditions:

- Within 10 feet of any commercial property line, except when it is a joint-use driveway serving two abutting commercial properties and access agreements have been exchanged and recorded by the two abutting property owners.
- Within 25 feet of a guardrail ending.
- Within 100 feet of a bridge or other structure, except canal service roads.
- When adequate sight distance cannot be provided for vehicles on the driveway attempting to access the street, since those movements will be prohibited.
- When the nearest edge of any driveway flare or radius must be at least 2 feet from the nearest projection of a fire hydrant, utility pole, drop inlet and/or appurtenances, traffic signal, or light standards.
- For parking or loading areas that require backing maneuvers in a public right-of-way, except for single-family or duplex residential uses on local roads.
- If a property has frontage on more than one street, access will be permitted only on those street frontages where standards set forth herein and other County Regulations can be met.

If any access point identified by a property owner cannot use these guidelines to serve a property, the County may designate one or more access point(s). This designation can be based on traffic safety, operational needs, and conformance to as many of the requirements in these guidelines as possible. This does not constitute a guarantee by the County to provide access to a property.

Exceptions to the guidelines may be made by the County in cases where the application of these guidelines would create an undue hardship to the abutting property owners and good traffic engineering practice can be maintained.

Driveway Location Coordination

The location of access for properties on opposite sides of the highway shall be coordinated so that they do not interfere with each other.

- Driveways should be located directly opposite each other to ensure that they share a single access location.
- Where lots are not large enough to allow accesses on opposite sides of the street to be aligned, the center of driveways not in alignment will normally be offset a minimum of 150 feet on all collector roads, and 330 feet on all industrial, major, and arterial roads. Greater distances may be required if left turn storage lanes require them.
- Joint access will be required for two adjacent developments where a proposed new access will not meet the spacing requirements set forth in this section.

10. GOALS AND POLICIES FOR CIRCULATION ELEMENT

A set of transportation/circulation goals and policies provide a guide for future development of the County's multimodal circulation system. These goals and policies support the Land-Use Element.

Goal 1: Develop a system of county roads and state highways to safely and conveniently serve the residents, businesses, and visitors of the County.

- Objective 1.1 Work with the Arizona Department of Transportation (ADOT) and the two municipalities to develop an access management plan for US 70, US 191, State Route 75, State Route 78, and other arterials and major collectors.
- Objective 1.2 Work with ADOT, SEAGO, Cochise County, Graham County, and municipalities to complete US 191 as a four-lane divided highway from I-10 near Willcox to Clifton.
- Objective 1.3 Work with ADOT to expand capacity and address safety concerns on State Route 75 such as additional lanes and passing lanes.
- Objective 1.4 As traffic development warrants, address capacity and safety concerns on paved County roads and work with land owners to pave existing unpaved County roads.
- Objective 1.5 Preserve future rights-of-way for anticipated capacity expansion and access management projects.
- Objective 1.6 Work with the U. S. Forest Service to integrate and coordinate Forest and County roadway systems.
- Objective 1.7 Work with ADOT, Cochise County, and the Arizona Office of Tourism to establish an information center on I-10 near San Simon to welcome incoming motorists and inform them of attractions and facilities in Arizona and Cochise and Greenlee Counties.

Goal 2: Develop a multi-modal transportation system

- Objective 2.1 Work with the two municipalities to develop a transit plan to bring people to and from essential services.
- Objective 2.2 Develop Greenlee County standards for bike paths and trails.
- Objective 2.3 Develop plans for assisting volunteer hiking, bicycling, and equestrian organizations in improving, signing, and maintaining the trail system.

Goal 3: Develop Rail, Trucking, and Aviation Facilities

- Objective 3.1 Assist the Union Pacific Railroad in recruiting industries to rail-served industrial sites in the County.
- Objective 3.2 Consider existing and future needs of truck operators when developing expansion and access management plans for County roadways.
- Objective 3.3 Work with the ADOT Aviation Department to monitor activity at Greenlee County Airport and anticipate and prepare for future facility improvements.
- Objective 3.4 Work with the ADOT Aviation Department and the Town of Duncan to prepare for future facility improvements at Sandra Day O'Connor Field.
- Objective 3.5 Explore the long-range feasibility of rail passenger excursion service on the line between Clifton and Duncan, as well as possible rail shuttle service between downtown Clifton and the Morenci Mine.

APPENDIX A. ESTIMATING TRANSIT DEMAND

ESTIMATING TRANSIT DEMAND

The TCRP estimations were developed based on specific population groups within the hypothetical service area presented in Figure A-1 (page 146). These population groups are typically referred to as transit dependent populations, and statistically are the most likely to use transit if available. The groups include (as defined by the Census); person aged 65 or over, persons aged 16 to 64 with mobility limitations, and persons aged 64 or under, residing in households with incomes below the poverty level. Table A-1 shows the total 2030 forecasted populations for each group in the hypothetical service area.

**TABLE A-1. CURRENT POPULATION OF SERVICE GROUPS
IN SERVICE AREA**

Service Group	Population
Persons aged 65 or over	846
Persons aged 16 to 64 with mobility limitations	1,222
Persons aged 64 or under, residing in households with incomes below the poverty level	846

Source: Lima & Associates, Inc.

The TCRP workbook also requires estimations of vehicle miles per year, and subsequently vehicle miles per square mile. These estimations are used to understand the level, or amount of transit that will be available to a defined service area. Preliminary assumptions for the number of trips per day, service days per year, and length of the transit routes were also made. It was assumed that service would be provided twice daily between Morenci, Clifton, and Safford, twice daily between Duncan and Safford, and twice daily between Morenci, Clifton, and Duncan. These trips would result in 304 vehicle miles per day. Assuming that service was provided six days per week, or 312 service days per year, the annual vehicle miles for the hypothetical system would be 94,848. Table A-2 shows the process used for calculating the vehicle miles per square mile.

TABLE A-2. CALCULATION OF VEHICLE MILES PER SQUARE MILE

Calculations	Data
Estimated vehicle miles per day =	304
Estimated service days per year =	312
Estimated vehicle miles per year =	94,848
Estimated size of service area (square miles) =	280
vehicle miles / service area =	
Vehicle miles per square mile =	339

Source: Lima & Associates, Inc.

The calculations from Table A-2, specifically the vehicle miles per square mile, are input into a formula provided in the TCRP workbook to create a service factor for each population group. These formulas rely on given factors which are related to the vehicle miles per square mile. Table A-3 shows the calculation of the service factors needed for calculating the estimate of transit demand.

TABLE A-3. SERVICE FACTOR CALCULATIONS

Population Group	Vehicle Miles per Square Mile	Multiplied by TCRP Factor 1	Plus TCRP Factor 2	Divided by 1 million	Equals Service Factor
Over 65	339	2.682	376	1,000,000	0.00128519
Mobility Limited	339	1.57	1010	1,000,000	0.00154223
Below Poverty	339	2.45	525	1,000,000	0.00135555

Source: Lima & Associates, Inc.

These derived service factors, based on the frequency of service and size of the service area, are part of the final calculations to estimate demand. Table A-4 shows the formula provided in the TCRP workbook, which includes a standard factor, population of each group, and the service factor. Table A-4 shows the estimated demand for each population group and the total estimated demand for transit. This methodology estimates a total yearly demand (all trips made during a year period) for Southern Greenlee County of 4,943 trips, an average of about 16 trips per day (assuming 312 days of service).

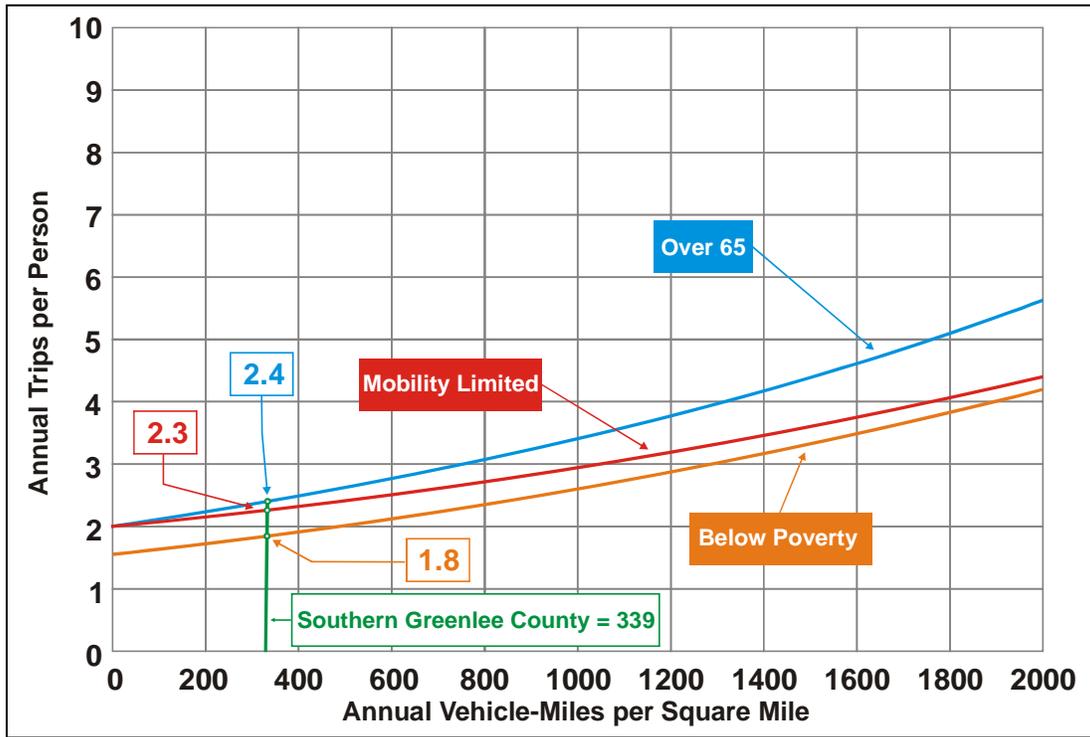
TABLE A-4. ESTIMATION OF TRANSIT DEMAND

Population Group	TCRP factor	x	Population	x	Service Factor	=	Estimated Annual Demand
Over 65	1,200	x	846	x	0.00128519	=	1,305
Mobility Limited	1,200	x	1,222	x	0.00154223	=	2,262
Below Poverty	1,200	x	846	x	0.00135555	=	1,376
Total Estimated Annual Transit Demand =							4,943

Source: Lima & Associates, Inc.

The TCRP workbook includes an alternative method for estimating demand. This alternative method provides a secondary demand estimate that can be compared against the first. This alternative method is based on pre-calculated trip rate curves created from research and analysis of other rural transit programs. The chart compares vehicle miles per square mile (as derived in Table A-2) against annual trips per person as shown in Figure A-1.

FIGURE A-1. TRIP RATES FOR ALTERNATIVE ESTIMATION PROCEDURE



Source: Adapted from: TCRP Report 3, *Workbook for Estimating Demand for Rural Passenger Transportation*, Figure 6, pg 45.

The estimated trip rates for the hypothetical Southern Greenlee County service based on 51 vehicle miles per square mile for each population group are overlaid on the chart taken from the TCRP workbook, and shown above in Figure A-1.

The estimated trip rates taken from Figure A-1 are used to estimate the demand for each population group as shown in Table A-5. The total estimated demand, using this alternative method, is 6,365 annual trips, or 20 trips per day (assuming 312 service days).

TABLE A-5. ESTIMATION OF TRANSIT DEMAND - ALTERNATIVE METHOD

Population Group	Population in Service Area	Trip Rate (from Figure A-1)	Estimated Demand (Pop. x Trip Rate)
Over 65	846	2.4	2,031
Mobility Limited	1,222	2.3	2,811
Below Poverty	846	1.8	1,523
Total Estimated Trip Demand =			6,365

Source: Lima & Associates, Inc.

APPENDIX B. FREEPORT-MCMORAN EMPLOYEE SURVEY



Morenci Mine Employee Transportation Survey



PURPOSE: Greenlee County is sponsoring a study to assess area transportation needs and identify transportation and transit projects to be included in Southern Greenlee County’s long range transportation improvement program. The data collected by means of this survey will help Lima & Associates, Inc., the consultant retained by the County, to better understand the transportation needs of Mine employees.

Please complete the survey form below and return to your supervisor.

1. What days do you work (circle all that apply)

MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY SUNDAY

2. Which shift do you work?

Day Shift Night Shift Swing Shift 12-Hour Day Shift 12-Hour Night Shift

3. Where do you live?

Morenci Clifton Three-Way/York Valley Duncan Safford area
 Other (Specify) _____

4. How do you currently travel to and from your job?

Drive alone Carpool Walk/Ride Bicycle

5. If you checked “Drive alone” in Question No. 4 above, please check the reason you drive to work alone:

I have been unable to find someone with whom I could carpool
 I need my car to run errands on the way to or from the Mine
 I need my car to drop off or pick up my children from school on the way to or from work
 I prefer the privacy of driving alone

6. If you checked “Carpool” in Question No. 4 above, please check one of the following:

I carpool to work in order to save money
 I carpool to work in order to avoid a long, boring drive alone
 I only carpool to work because I do not have a car

7. If the Mine or the County found someone to share a ride with you, would you consider carpooling?

Yes No

8. If the Mine or the County operated a bus or van on a schedule that worked with your shift, would you consider taking it to and from work?

Yes No

Thank you for your participation!

APPENDIX C. SAMPLE RIDESHARE APPLLICATION

SAMPLE RIDESHARE APPLLICATION

Greenlee County maintains a community-wide database of commuters looking for rideshare partners. If you would like to find a carpool partner, form or join a vanpool, or find a bike buddy, submit this form and a free match list will be sent to you.

You must either live **or** work within Greenlee County.

First name: _____ Last name: _____

Email Address: _____

Home Address: _____

City: _____ Zip Code: _____ Home Cross Streets: _____

Employer: _____

Work Address: _____

City: _____ Zip Code: _____ Work Cross Streets: _____

Home Telephone: _____ Work Telephone: _____

Work Schedule: Beginning _____ a.m. p.m. Ending _____ a.m. p.m.

To have information faxed to you, please supply your fax number: _____

Please check all that apply:

I prefer to be called at	<input type="checkbox"/> Home.	<input type="checkbox"/> Work.	<input type="checkbox"/> Either.
My work hours are flexible.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
I'm interested in finding a "Bike Buddy".	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
I would like bus information.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
I would like to be a vanpool driver.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Comments:

Source: Regional Public Transportation Authority, Phoenix

APPENDIX D. SAMPLE ON-BOARD SURVEY

SOUTHERN GREENLEE COUNTY DIAL-A-RIDE ON-BOARD SURVEY

11. The Arizona Department of Transportation has funding available for transit purposes. Do you believe that Greenlee County should make use of these monies to provide transit service? Yes No

12. In order to obtain money from ADOT, the County would need to match the amount from local tax dollars. Would you support or oppose this idea to provide transit service in Greenlee County? Support Oppose

13. How much would you be willing to pay to use a service that operated on specific routes on a fixed schedule if one or more of the routes were convenient for you?

Less than \$1 \$1 - \$2 \$2 - \$3 Greater than \$3

14. How much would you be willing to pay to use a service that picked you up at your origin and dropped you off at your destination?

Less than \$1 \$1 - \$2 \$2 - \$3 Greater than \$3

PURPOSE: Greenlee County is assessing options for enhancing area public transportation services. As a current user, your opinion is important to us. Please take a few minutes to fill out this form. Thank you.

HOUSEHOLD CHARACTERISTICS: Let's begin with a couple of questions to help us understand your answers.

1. In which of the following areas do you live?

Clifton Duncan
 Morenci York Valley
 Three-Way Other

2. How many members of your household are...

15 or younger? _____
16 to 24? _____
25 to 34? _____
35 to 44? _____
45 to 54? _____
55 to 64? _____
65 or over? _____

3. What is your ethnic background?

White African-American Hispanic Asian Native American Other

4. How long have you lived in your current residence?

5. How many vehicles do household members possess?

6. Would you say your total family income last year before taxes was...

- \$10,000 or less?
- Between \$10,000 and \$20,000?
- Between \$20,000 and \$30,000?
- Between \$30,000 and \$40,000?
- Between \$40,000 and \$50,000?
- Between \$50,000 and \$60,000?
- Over \$60,000?
- Prefer not to say.

HOUSEHOLD NEEDS

7. With respect to the following types of trips: Which does one or more members of your household make on a daily or frequent basis, and by what means of transportation?

Type of Trip	No. of Trips	Means of Travel				
Work	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other
School	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other
Shopping	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other
Medical	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other
Recreational (movies, dining, etc.)	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other
Other (describe)	_____	<input type="checkbox"/> Drive alone	<input type="checkbox"/> Carpool	<input type="checkbox"/> Van	<input type="checkbox"/> Bicycle	<input type="checkbox"/> Other

8. Which of the following statements best describes the transportation situation in your household:

- Satisfactory. Household members are able to make all necessary trips.
- Less than satisfactory. Household members are sometimes unable to travel when needed.
- Poor. One or more household members are unable to work, attend school, see to medical needs, or other due to lack of transportation.

PUBLIC TRANSPORTATION

9. Considering the following types of transit systems, how important would you say it would be to provide service for County residents? Would you say it would be very important, somewhat important, or not important to have

A local transit system within the County?	<input type="checkbox"/> VI	<input type="checkbox"/> SI	<input type="checkbox"/> NI
A local system with connections to Safford?	<input type="checkbox"/> VI	<input type="checkbox"/> SI	<input type="checkbox"/> NI

10. Do you think the Greenlee County service should include...

- A regularly scheduled service connecting Clifton, Duncan and Safford ?
- A daily "dial-a-ride" bus or van that provides door-to-door service?
- A combination of both?
- Something else (specify)?
- Or nothing at all?

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