Cochise County

2040 Long-Range Transportation Plan

Final Report

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Prepared for **Cochise County**

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Public Programs - Personal Service

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ACRONYMS

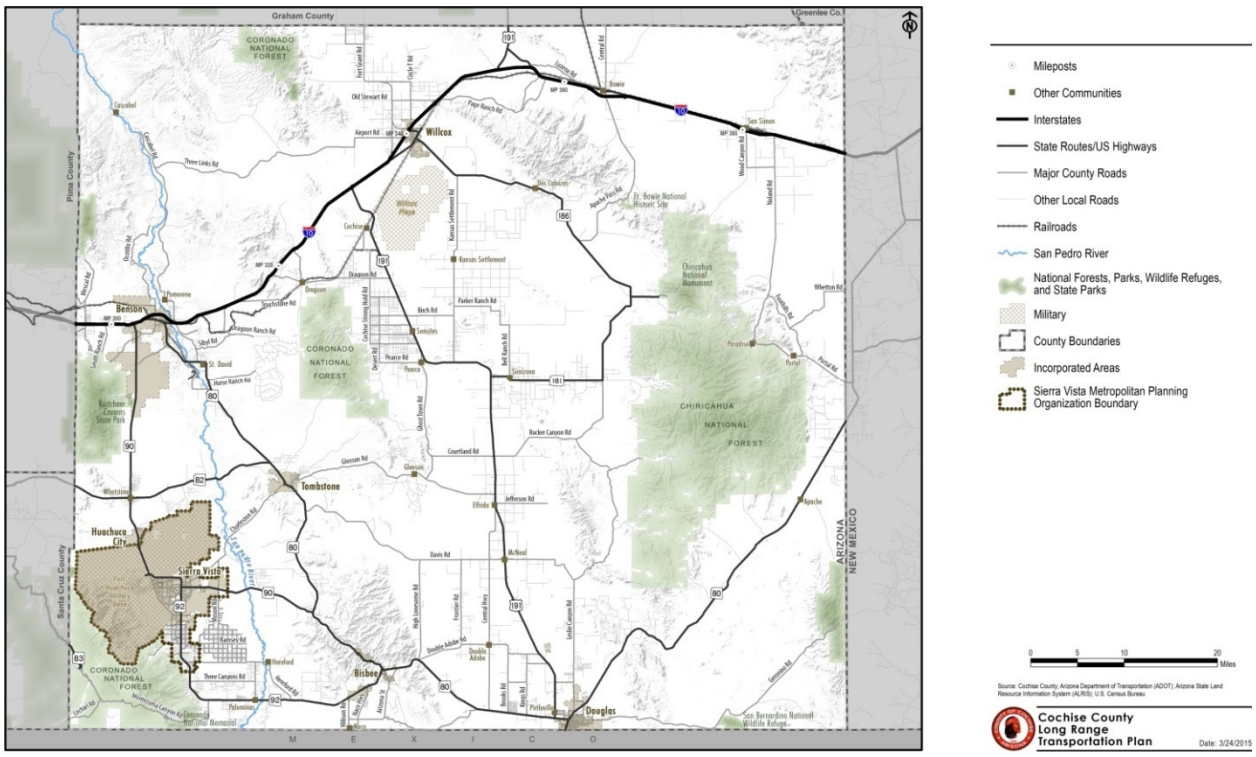
AASHTO	American Association of State Highway and Transportation Officials
AB	Aggregate Base
AC	Asphalt- Concrete
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADT	Average Daily Traffic
ASCE	American Society of Civil Engineers
BQAZ	Building a Quality Arizona
CBI	Coordinated Border Infrastructure
EJ	Environmental Justice
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
HURF	Highway User Revenue Fund
ITS	Intelligent Transportation Systems
LPOE	Local Port of Entry
MUTCD	Manual of Uniform Traffic Control Devices
NAAQS	Natural Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHS	National Highway System
PAG	Pima Association of Governments
PARA	Planning Assistance for Rural Areas
RASP	Regional Aviation System Plan
ROW	Right-of-Way
SEAGO	Southeast Area Council of Governments
SIP	Arizona State Implementation Plan
STP	State Transportation Program
SVMPO	Sierra Vista Metropolitan Planning Organization
TIP	Transportation Improvement Program
U.S.	United States
USBR	U.S. Bicycle Route
USFS	United States Forest Service
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled

INTRODUCTION & LOCATION

Introduction

Cochise County was formed in 1881, three decades prior to the Statehood of Arizona in 1912, and has the responsibility of declaring, developing and maintaining the County's roadway system. There are currently seven incorporated areas within Cochise County; the cities of Sierra Vista, Douglas, Bisbee, Benson, Willcox, Tombstone, and the Town of Huachuca City. Map 1 depicts the study area and the major roadways in 2014.

MAP 1: STUDY AREA



Project Location

Cochise County consists of 6,219 square miles located in the southeast comer of Arizona. National Forest and Parks, State Parks, Wildlife Refuges or Wilderness areas, Bureau of Land Management and Arizona State Trust lands and Game and Fish Wildlife preserves account for nearly 57 percent of Cochise County. Of the remaining unincorporated County lands, 92 percent of it is currently zoned RU4 (Rural, 4 acres). A variety of uses is allowed in RU-4 zoning, primarily rural residential but also compatible rural land uses such as agriculture and ranching, vineyards, and scattered small scale commercial enterprises.

A number of roads, or road segments, were established and maintained by the County Board of Supervisors prior to Statehood. Many of these roads remained in continuous use and have been part of the County maintenance system for over a hundred years. Roads so established, constructed and maintained prior to June 13, 1975, were declared part of the County highway system with 66 feet of right-of-way pursuant to Arizona Revised Statutes §28-7042.

The primary transportation corridors in the County are Interstate 10 and State Highways 80, 82, 90, 92, 181, 186, and 191. These state-maintained roadways link communities as well as connect travelers and freight to neighboring counties, New Mexico to the east, and the Republic of Mexico to the south. Cochise County currently maintains 1,438 miles of roads, of which 637 miles have hard, paved surfaces and 801 miles are natural dirt surfaces. Paved roads include 102 miles of rural major collectors, 184 miles of rural minor collectors, and 604 miles of local major or minor access roads. Of these, just over 234 miles have a federal functional classification (eligible for state or federal funds). Approximately 520 miles of the dirt roads are maintained as "Primitive Roads" and were constructed, in use and maintained by the County prior to 1975.

Long-Range Strategic Plan 2011-2015

In April of 2011, the Board of Supervisors adopted a Long-Range Strategic Plan for 2011 to 2015. One specific goal focused entirely on infrastructure management. With a stated desire to prudently manage the County's investment in civil and capital infrastructure, the first objective the Board identified was to protect, maintain, and enhance the County's investment in its civil infrastructure (roads, streets, flood control). Two specific implementation strategies targeted transportation issues: the first, to develop a long-term (20-30 year) transportation infrastructure plan and, secondly, to identify key County transportation corridors.

COCHISE COUNTY STRATEGIC PLAN 2011-2015 VISION STATEMENT:
Cochise County fosters diverse, vibrant and safe communities,
planning for the future while honoring our legendary cultural heritage.

The Long-Range Transportation Plan, known as the 2040 LRTP, was then developed and includes a set of potential programs, policies, strategies and multi-modal projects to help move people and goods from one place to another. It also identified the major transportation and economic corridors in the County, prioritizing them for proactive right-of-way acquisition, improvements and future upgrades. The 2040 LRTP assessed the overall anticipated costs of operating and maintaining the existing transportation system as well as the costs of building, operating and maintaining new capital investments. It also compares those costs to anticipated revenues to determine the extent to which new transportation revenues may be needed.

WORKING PAPER ONE: This paper compiled information about the County's existing roadway network, projected travel demand into the 2040 out-year of this plan, and identified the transportation system needs and challenges the County currently struggles to address and those that are anticipated to occur in the next 25 years.

WORKING PAPER TWO: This paper provided a review of programs, policies, strategies and recommendations by mode of travel that the County may desire to continue or develop over the next 25 years. Existing and projected revenues are discussed in this paper, along with cost estimates and potential revenue sources to address identified transportation system needs.

PREVIOUS PLANNING EFFORTS

The current Federal transportation legislation, Moving Ahead for Progress in the 21st Century, known as MAP-21, states that it is in the national interest to "….encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas, while minimizing transportation-related fuel consumption and air pollution…" 23 U.S.C. 134(a) (1). Federal requirements also mandate that these long-range plans consider specific planning factors, provide for multi-modal transportation solutions, maintain a 20-year horizon, be fiscally constrained and provide meaningful public participation in the process. Cochise County has not yet reached the population threshold that requires the development of such a plan; however, County elected officials and staff believe that understanding the future infrastructure needs of the County will help the County better manage current investments and more effectively plan to address future needs.

Federal Transportation Planning Factors:

- *Support the economic vitality of the area in the global market.*
- *Increase safety of the transportation system.*
- *Increase the security of the transportation system.*
- *Increase accessibility and mobility options for people and freight.*
- *Protect and enhance the environment, promote energy conservation, improve quality of life and promote consistency between transportation improvements and growth.*
- *Enhance integration and connectivity of transportation systems.*
- *Promote efficient system management and operation.*
- *Emphasize the preservation of existing intermodal transportation systems.*

Cochise County, while not mandated to produce a specific long-range transportation plan, has continuously developed both adopted work plans and internal departmental capital improvement plans that have considered policies and projects for the County's roadway system. These have built upon each other and have been presented to County residents in a variety of forums, including formal Board public hearings, work sessions, public meetings, presentations and outreach efforts.

County Comprehensive Plan

The first County plan to consider both transportation and land uses together was the Cochise County Comprehensive Plan, first adopted in 1984. Eight amendments have since followed with the latest version adopted on March 24, 2015. The Comprehensive Plan was updated to reflect Census 2010 results and this 2040 LRTP expands upon the Transportation Policies element.

County Comprehensive Plan Transportation Goals:

- *Provide a safe, well-maintained, cost-effective and energy efficient transportation network for the use and enjoyment of county residents and businesses, including residents who are transit-dependent or mobility-impaired or those who prefer motorized modes.*
- *Support air travel opportunities while minimizing the impacts on human and natural communities.*
- *Improve non-motorized circulation networks and provide greater opportunity for alternative modes of travel.*

Envisioning 2020

During 2007 and 2008 the Planning and Zoning Department conducted a series of 13 facilitated workshops and a statistically validated telephone survey to talk with residents about their priorities for the County's future. This effort was known as Envisioning 2020 and was presented to the Board of Supervisors in September of 2008. Public participation included 448 participants in the workshops and 406 randomly-selected male and female heads of households for the survey. This represents roughly 1.6 percent of the County's unincorporated population or about 4.2 percent of households.[1] What these residents told the County was that they valued the rural character of Cochise County, their ranching and agricultural lifestyles, small town atmosphere and supported property rights. They also expressed a desire to see the County recognize and protect historic sites, water resources, wildlife habitats and dark, night skies. The phone survey echoed these comments with the prominent themes centered on health care availability, living wage employment, property rights, need for providing clear conditions for managed growth and water conservation. These perspectives, while meaning different things to different participants, nevertheless express common themes that influence how the County develops future infrastructure.

It may seem that concerns about health care or dark night skies are not inherently transportation issues. Yet a transportation system not only allows people to travel to where they need and want to go; it also can create a sense of place and help people move within it. For example, strategies that address transportation infrastructure needs, while also addressing broader concerns of County residents, include constructing pathways that create healthy options for people to walk instead of relying on a vehicle for short trips, and using lighting and reflecting systems for roadways that safely light the way without having an adverse effect on dark skies.

STATISTICAL PROFILE AND PROJECTED GROWTH

In the 1900 decennial census, 9,251 residents were recorded in Cochise County. Rapid increases in population occurred over the next 20 years associated with the western expansion, exploration and mining activities. By 1920, there were over 46,000 residents. New residents settled along the border and what would become the Interstate corridor. Four of the County's seven cities would incorporate during this time with Benson following in 1924. Population then spiraled back downward, dropping over 15,000 residents, until an upward growth surge after 1950.

Fort Huachuca has shared its history with Cochise County from its beginning as an army camp in early 1877 and designation as a Fort in 1882. Although decommissioned for a short time after WWII, the Fort was re-established in 1954 and the Cities of Sierra Vista and the Town of Huachuca City were developed to serve the needs of the late 1950's population surge. Former enlistees that served at the Fort during the Korean and Vietnam periods are now returning as retirees either as seasonal visitors or permanently moving to this area.

Population centers have followed historic travel routes and today oval shaped population distribution patterns are dissected by Interstate 10 and the state highway system. Cochise

[1] Survey confidence level of 95 percent and a margin or error just under 5 percent.

County has a population today equivalent to Maricopa County in about 1920 or Pima County around 1950. From 2000 to 2010, the population in Cochise County increased 11.5 percent to 131,346, while the total housing units increased 15.5 percent to 59,041. The number of the occupied housing units also increased 15.88 percent to 50,865 in 2010 with an occupancy rate of 86.2 percent.

TABLE 2: POPULATION AND HOUSING UNIT COMPARISON

	Cochise County	Sierra Vista	Douglas	Bisbee	Benson	Willcox	Huachuca City	Tombstone	Unincorporated Area
Total Population									
2010	131,346	48,031	15,305	5,912	5,220	4,195	1,998	1,411	49,274
2040	163,749	58,222	17,347	6,150	6,688	4,743	2,034	1,464	67,101
% Increase	24.67%	21.22%	13.34%	4.03%	28.12%	13.06%	1.80%	3.76%	36.18%
Total Housing Units									
2010	59,041	20,644	5,681	3,456	2,994	1,873	957	885	22,551
2040	75,629	26,135	6,517	3,463	3,743	2,089	974	887	31,821
% Increase	28.10%	26.60%	14.72%	0.20%	25.02%	11.53%	1.78%	0.23%	41.11%
Total Employment									
2010	40,835	20,064	4,597	2,881	3,445	2,659	369	619	6,201
2040	53,318	24,637	5,981	3,008	5,159	2,907	416	653	10,557
% Increase	30.57%	22.79%	30.11%	4.41%	49.75%	9.33%	12.74%	5.49%	70.25%

Source: Bureau of the Census & Cochise County Transportation Model Dataset.

- The 2010 elderly population located within the unincorporated area of the County was estimated to be 19.8 percent of the total population of the unincorporated areas: higher than both the County as a whole (17.3%) and the State (13.8%) estimates. The over 60 population are more likely to suffer from mobility impairments and, as the elderly population increases, so does the number of people who are no longer able to drive.
- Based on the 2009-2013 American Community Survey, 17.1 percent of the County's population are considered to be living below the poverty level ($11,670/yr); this is slightly lower than the State's (17.9%) poverty estimates. For families with young children, the rates go sharply up to 23.5 percent and for single women with children under 5, their poverty rate was 51.1 percent.
- Recent population estimates produced by the Dept. of Administration for July 1, 2014, show declines in County population to 129,628, of which 51,104 are in the unincorporated areas.
- Long-range projections, developed for the transportation model, anticipate a population of 163,749, with total housing units of 75,629, by the year 2040.

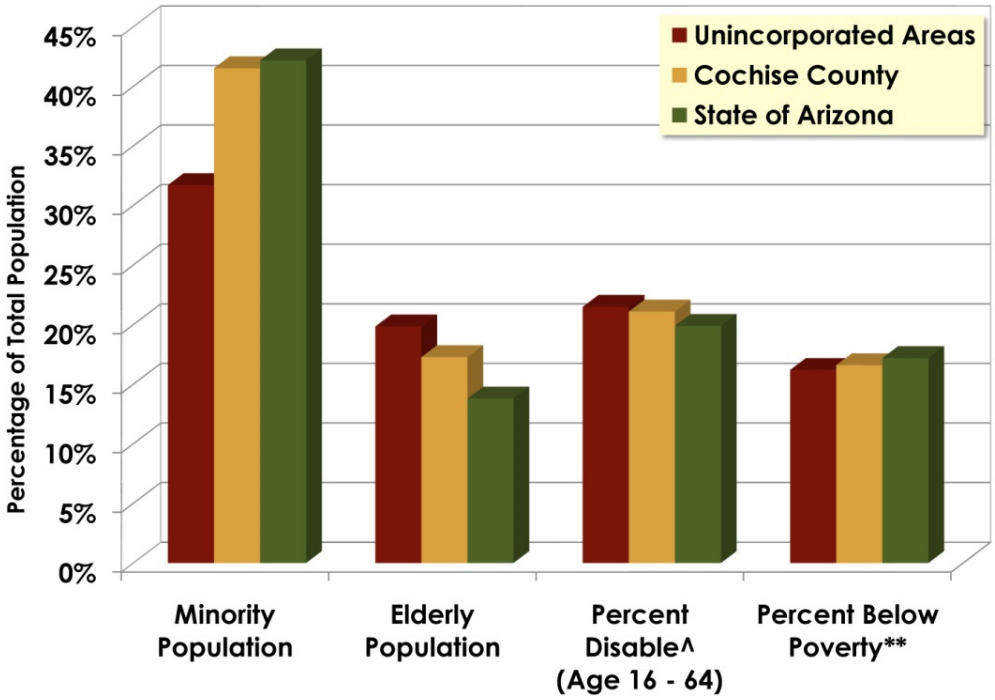
Environmental Justice Review (Title VI)

Title VI of the Civil Rights Act of 1964 and related statutes require individuals not be 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. Environmental justice principles and procedures are followed to assure that transportation improvements do not adversely impact different socioeconomic groups. To assure that these policies are adhered to, a variety of possible alternatives should be developed and considered in order to make sure all groups are fairly represented in the amount and type of transportation services provided.

Protected populations considered in this analysis include minority, elderly, low-income, and disabled populations. Chart 3 summarizes the percentage of minority and elderly populations within the unincorporated county area, Cochise County, and Arizona.

CHART 3: TITLE VI POPULATION GROUPS COMPARISON



Source: 2010 U.S. Census, ^2000 U.S. Census, **2008 - 2012 American Community Survey

Ethnicity & Race

According to the 2010 Census, Hispanics constituted 32.4 percent of the County's total population compared to 29.6 percent of the state and 16.3 percent of the nation. Native Americans accounted for 0.8 percent of the County's population, African Americans for 3.8 percent, Asian/Pacific Islanders for 1.8 percent and Native Hawaiian/Pacific Islander for 0.3 percent. Multi-racial, that is persons indicating two or more races, were indicated by 4 percent of the population.

The dominate European ethnicity identifies with either a German or Irish ancestry. It is also notable that a dramatic shift in ethnicity is seen among the young of Cochise County: almost half (47.37%) of all those under the age of 18 are Hispanic. This mirrors the demographic profile in Arizona which has the largest age gap between race/ethnicity in the Nation.

Age, Sex & Disability

The median age of Cochise County's 2010 population was 39.7 years – several years higher than the national median age of 37.2. There are more males in the County than females, with the women slightly older (median age of 41.8) on average then the men (median age of 37.8). The 2010 population in Cochise County was 49 percent female and 51 percent male.

Roughly 21.5 percent of the population in the unincorporated areas between the ages of 16 and 64 are mobility limited: this is slightly higher than both the County (21.1%) and State (19.9%) estimates. Disabled veterans are in this category; many of them in their 20's and 30's. Individuals who have a physical or mental disability that prohibits them from operating a vehicle are considered to be mobility-limited. These population groups require access to other forms of transportation and often rely on public or non-profit bus and shuttle systems.

Persons per Household

In the Cochise County area the average household size went down slightly to 2.46 from 2.55 in 2000 continuing a 50-year state-wide trend downward in persons per household ratios.

Income and Poverty

As reported in the 2008-2012 American Community Survey (ACS), the median household, *all people who occupy a housing unit of regardless of relationship*, income for Cochise County is $45,505 while the median family, *two or more people who occupy a housing unit that are related through birth, marriage or adoption*, income is $54,034.

- Based on the 2008-2012 American Community Survey, 16.2 percent of the unincorporated area population are considered to be living below the poverty level; this is slightly lower than the County's (16.6%) and State's (17.2%) poverty estimates.
- An individual is considered to be in poverty if their annual income is less than $11,670 dollars (in 2013). The threshold varies by household size and a family of four is considered to be in poverty if their annual income is less than $23,850.
- Many households, while not meeting the Census definition of poverty, do meet the criteria of being housing poor (housing costs exceed 28 percent of income) or food insecure (adequate healthy food is beyond the household's resources). Median mortgage costs in Cochise County are $14,124 annually. A household with a median income would spend 31 percent of their income on housing.

Title VI, ADA and Environmental Justice Assessment

Plan components are concentrated in the primary corridors of the County; thus the benefits provided should be of equal value to all users of the system regardless of their race or income status. None of the projects or programs is expected to have significant negative right-of-way or air quality impacts on protected class population groups. All proposed projects are expected to have appropriate public involvement and mitigation techniques applied during their design development process. When prioritizing short-range improvements projects care should be taken to provide equivalent services, maintenance and improvements to all areas of the County.

Recommendations for Mitigating Impacts on Vulnerable Population Groups

- Complete the County's Title VI Public Participation Plan and update every ten years.
- Prepare county-wide public outreach, in coordination with the Bureau of the Census, to improve demographic and socio-economic data during each decade Census.
- Develop targeted public outreach techniques for protected Title VI and EJ population groups.
- Consider the need for services for residents that own no vehicle or are unable to drive.
- Monitor regulatory changes mandating accommodations within the American with Disabilities (ADA) act and implement, when feasible, enhanced signing and striping in areas with larger numbers of elderly drivers.
- Provide, when feasible and appropriate, specialty signing or signals in areas with deaf or blind students.

Employment and Economic Profile

As of November 2013, the civilian labor force in Cochise County totaled approximately 56,797 people ~ about 43 percent of the population. Government employment was reported to be 12,050 jobs ~ about 9.2 percent of the population. The County's average unemployment rate in 2013 was at 7.9 percent, a decline from a reported high of 10.2 percent in 2011.[2]

Job growth is estimated to be between one and two percent in the next few years. The influence of tourism, education and retirement is reflected in a much higher percentage of jobs in services, retail trade and government and a much lower percentage employed in manufacturing, wholesale trade and finance/insurance/real estate. In 2014, the largest employer in the County was Fort Huachuca, followed by other government related services: United States Customs and Border Protection; Arizona State Prison Complex in Douglas; and, the Sierra Vista Unified School District.

Tourism Impacts

The natural beauty in the County's remote recreational lands attracts over 355,000 visitors annually to Cochise County. Tourism accounts for one out of every ten jobs and adds over $1.8 billion per year to the local economy. Nonconsumptive wildlife-related recreation is also enhanced by improved transportation infrastructure: in 2001 this activity alone generated a total of $13.72 million in retail sales within the County and supported 489 full and part-time jobs valued at $7.08 million in salaries and wages.[3] Approximately 57 percent of Cochise County consists of Federal or State held lands open to recreational activities for both County residents and traveling visitors. Top destinations include:

- Apple Annie's Orchard and Cider Mill
- Chiricahua National Monument
- Cochise Stronghold
- Coronado National Forest/Montezuma Canyon Area

[2] Arizona's unemployment rate was 10 percent in 2010 and dropped slightly to 9.3 percent in 2011. Loss in local government jobs has not yet been completely off-set by gains in private sectors jobs.
[3] *Economic Impact Analysis of Nonconsumptive Wildlife-Related Recreation in Arizona, AZ. Game and Fish, May 2003.*

- Ft. Bowie National Historic Site
- Ft. Huachuca Museum
- Kartchner Caverns State Park
- Las Cienegas National Conservation Area, BLM
- Ramsey Canyon Nature Preserve
- San Pedro River Valley
- Slaughter Ranch
- Tombstone Historical State Park
- Whetstone Mountains
- Whitewater Draw
- Willcox Playa Wildlife Area

Many of the state and federal recreational lands are not easily accessible and lack infrastructure supporting access to these public lands. Parking areas, trailheads and other amenities are frequently unavailable. Providing amenities for equestrian activities would attract both residents and visitors as well as support local horseback trail rides.

Providing adequate roadway capacity to serve these attractions, while still maintaining the natural beauty and quiet that has made the region desirable as a premier tourist site, is one of the County's challenges. Seasonal traffic counts are essential for understanding for the full impacts of tourism travel on the roadway network serving these destinations. The economic benefits to the County cannot be understated; yet, the revenues generated by tourism are rarely fed back into maintaining the infrastructure that supports these activities. Only one of the listed destinations is a commercial venture; the rest are managed by various government entities as part of the public's shared recreational assets.

Local Agricultural Impacts

An important economic component in the County's economy is not only traditional employment centers but is also ranching, farming and agricultural based activities. From greenhouses to feed lots, freight haulers use County maintained roadways to move their products to market. Small boutique vintners are expanding both their vineyards and their winemaking activities in Cochise County with the highest scoring estate wines in the state made from grapes grown on the eastern side of the Chiricahua Mountains.[4] Vineyards are expanding side by side with pecans and citrus with over 916,600 acres in the County under some kind of agricultural cultivation. The estimated 1,090 farms in the County range in size with 180 family farms of less than 10 acres but others are over 1,000 acres. The average farm size is just over 800 acres. An estimated 1,375 laborers were working in the agricultural fields in 2012 generating a payroll of $16.2 million. The market value of agricultural products sold in 2012 was valued at $150 million. Providing connections and adequate turning radii, along with timely access to markets, are key transportation components needed by this economic sector.

[4] 2013 rankings by the Wine Spectator of 90 points were awarded to the 2010 Page Springs Cellars Colibri Syrah Clone 174 and the 2010 Burning Tree Colibri Vineyard Syrah.

Port of Entry, Freight Movement and Border Issues

The international Ports of Entry also generate a considerable amount of non-local traffic that impacts the rural transportation infrastructure. Two active ports are located in Naco/Naco Sonora and Douglas/Agua Prieta Sonora. Although the beneficiaries are primarily urban or out-of-state areas, the rural allocations of highway funding must meet these needs, often at the expense of the local roadway system. These routes are also heavily used by the Border Patrol as part of its current border surveillance effort.

Cochise County is one of the nation's most important land ports for agriculture. U.S. food imports are a $78 billion dollar industry (2007 data) with a significant portion moving from Mexico to the United States through the southern Arizona ports. 70% of all fresh vegetables, 60% of milk products, 45% of sunflower and safflower oil, 30% of fresh fruits, 23% of preserved vegetables along with fish, seafood, flour, fresh cheese, cocoa powder and chocolate products arrive to feed the nation through the Arizona border region.[5]

The Douglas Port of Entry is planned for expansion within the next decade with infrastructure improvements being made on both sides of the border in order to relieve congestion and resulting delays from the truck volumes currently going through Nogales, AZ. The Naco Port of Entry is the only Arizona Point of Entry served by a county maintained local collector road instead of an Arizona state-maintained highway. The existing road network is not designed to accommodate projected increases in border-related enforcement traffic and international trade activities.

TABLE 4: YEAR 2012 INTERNATIONAL BORDER CROSSINGS BY MODE

	Trucks	Cars	Pedestrians	Buses	Trains	Total People
Douglas	31,636	1,405,122	1,198,838	2,065	-	3,829,000
Naco	3,728	270,416	72,896	21	-	566,648
Total Crossings at Arizona LPOEs	377,903	7,472,683	7,048,474	10,557	657	21,248,852

Source: Arizona Border Communities Roadmap

Border related activities; including freight movement and Border Patrol surveillance, has increased the number of heavier vehicles on Geronimo Trail, Naco Highway and Davis Road. Currently about half of the trucks crossing at the Douglas Port of Entry use Davis Road as their preferred route to State Highway 80. As a result these roads are in need of improvement to higher design standard to accommodate the heavier weights and larger turning radii needed to support the movement of goods and people from the international border to and through the County.

Socioeconomic Data Summary for the Travel Demand Model

For the 2040 LRTP, the Cochise County Travel Demand Model was used. Population, housing units, and various types of employment categories were inventoried for each Traffic Analysis Zone (TAZ) in the study area. TAZs are geographic subdivisions of the study area bounded by roads, political boundaries, natural and man-made geographical constraints (such as rivers, washes, etc.). The model was updated to include the population and housing units from the

[5] *U.S Food Imports Patterns, 1998-2007, USDA, August 2009.*

2010 U.S. Census and the employment data, from the previous 2007 model, was updated and expanded to included service, public, office, industrial, manufacturing, military and school employment categories. TAZ's describe the "travel-sheds" of the transportation network. Special generators are identified in the model for unique destinations sites with large traffic implications.

Table 5 summarizes socioeconomic data used in the 2014 Travel Demand Model. Data used does not exactly correspond to Census 2010 data due to the inclusion of TAZs that reach beyond the boundaries of Cochise County.

TABLE 5: YEAR 2010 SOCIOECONOMIC DATA SUMMARY

Socioeconomic Data Variable	Units	Cochise County Total
Population	**Persons**	**131,346**
Total Housing Units	**Housing Units**	**59,041**
Occupied Dwelling Units	**Housing Units**	**50,865**
Total Employment	**Employees**	**40,835**
Retail	*Employees*	*11,877*
Office	*Employees*	*3,791*
Service	*Employees*	*11,784*
Industrial	*Employees*	*3,172*
Public	*Employees*	*4,737*
Manufacturing	*Employees*	*1,168*
Elementary/Junior High	*Employees*	*2,287*
High School	*Employees*	*764*
University	*Employees*	*226*
Military	*Employees*	*1,029*

Cochise County 2040 Projected Population and Employment

Future population, housing units and employment were forecasted for the 2040 horizon year. Cochise County staff coordinated with local jurisdictions to update the projected housing units used in the previous model, as well as revise potential growth and annexation areas. Population and occupied dwelling units were estimated for the future year using the person to total household ratio and reflecting the vacancy ratios from existing 2010 conditions.

By the 2040, Cochise County is projected to have a population of 163,749, total housing units of 75,629, and occupied housing units of 53,318. Overall, Cochise County is projected to increase by 24.7 percent with an average growth rate for the County of less than 1 percent per year. Future population projections released from the Arizona Department of Administration, Office of Employment and Population Statistics included three scenarios: the high, medium, and low series. The updated 2040 Cochise County projected population (1636, 749) is between the low (157,482) and medium (173,377) dataseries estimates for the County. Projections used in this 2040 LRTP model reflected a more conservative view of the future growth in the County than had previously been used in earlier studies.

There is no known source for employment projections; however, the 2040 employment to population ratio from the previous model remained relatively consistent and was slightly revised for the updated 2040 employment projections to reflect existing 2010 conditions. Similar to the existing conditions, the 2040 employment data was expanded to include service, public, office, industrial, manufacturing, military and school employment categories. Total employment for Cochise County, by the year 2040, is estimated to be 53,318 with a 32.6 percent employment to population ratio.

The baby boom generation will be entering retirement age between 2011 and 2029. Baby boomers reaching the age of 65 can expect to live another twenty years as life-spans have increased from an average of 77 years to 84 years of age.[6] Increasing age frequently results in higher levels of varied disabilities and many will find that they cannot, or should not, drive anymore. Elderly accident rates typically mirror that of teenage drivers with recent studies indicating that the 18-to-19 year old accident rate is the same as that for 85 plus cohort. Addressing the needs of a large non-driving elderly population will be a challenge and require changes to infrastructure, transportation options and policies.

Intergenerational households are likely to increase over the next decade as the baby boomers age and debt-bound college students return home thus stabilizing or increasing the average persons per household. Millennials, those born between 1980 to 2000 (also known as the Gen Y cohort), have shown a preference for urban and dense suburban areas and are more likely to walk, bicycle or use transit than their parents. Transportation choices that allow for the concurrent use of digital devices is part of the reason for this generation shift but some surveys have indicated that economic reasons, combined with a desire to make healthier choices for themselves and the environment, are also factors. This paradigm shift regarding vehicle ownership may indicate that increased transportation options will be more highly desired in the future than increased roadway capacity.

TRANSPORTATION SYSTEM PROFILE

Existing Roadway Network Characteristics

The Cochise County model network consists of more than 1,600 miles of roadway, which includes Interstate 10 through the County as well as the street systems in the incorporated areas. The model network attributes were updated in 2014 to reflect current conditions. When excluding the street system in the incorporated areas and the State/U.S. highway facilities that by-pass through the local jurisdictions, the modeled network is then roughly 1,449 miles.

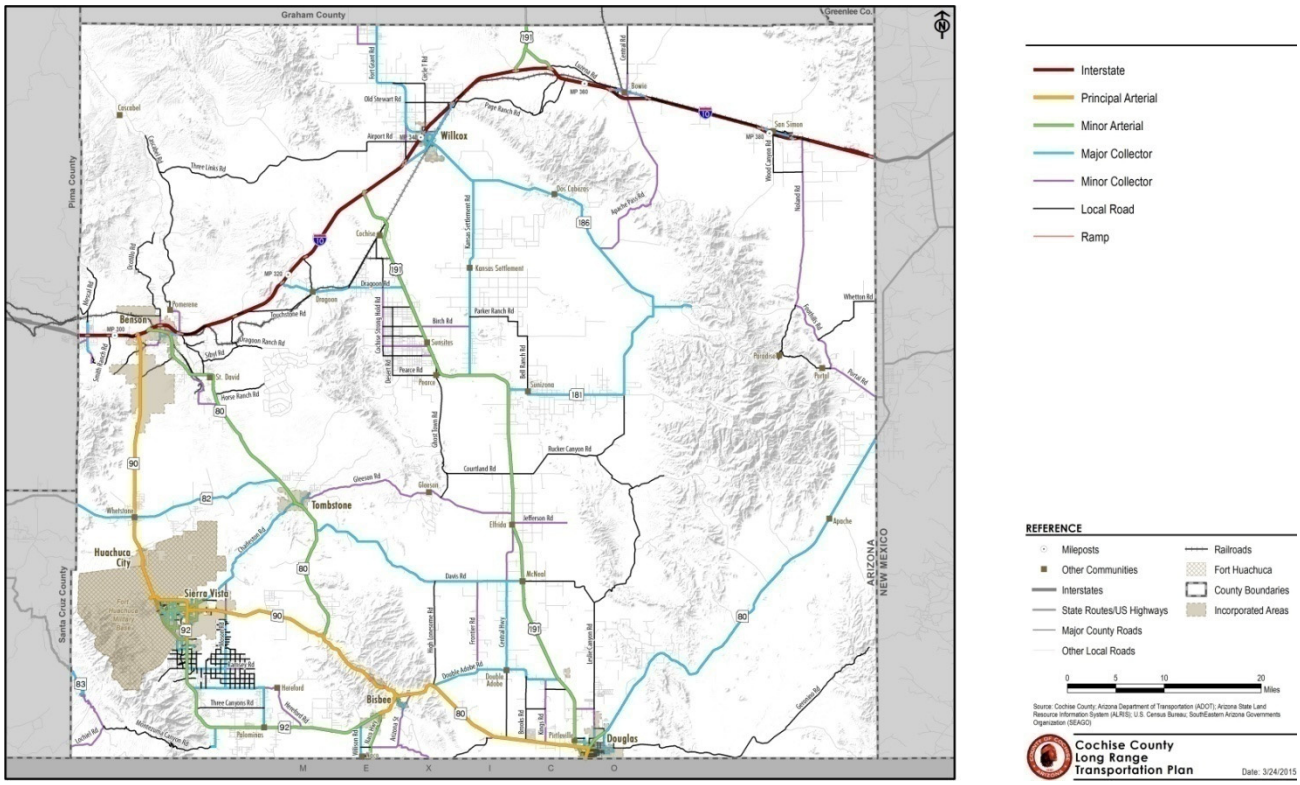
- As reported in the 2010-2012 American Community Survey, 76.3 percent of workers 16 years and older traveled alone when driving to work, 10.3 percent carpooled, and 5.1 percent walked.
- The reported average travel time to work for Cochise County was 19.1 minutes.
- Only 34 percent of the vehicles miles traveled in the County occur on non-state owned roadways: the state maintained facilities function as the County's major arterial and collector system.

[6] The children and grand-children of the baby boomers have a lower life expectancy with life-spans currently averaging 78.8 years. Higher incomes typically increase life-spans by about six years.

Functional Classification

Functional Classification is the grouping of streets and highways by the character of service they intend to provide. Specific criteria guide the designation of roadways as a Federal Functional Classified roadway, as opposed to a County level designation. Both a Federal and a County classification designation serve as a basis for establishing speed limits, design standards, and access controls. Most importantly, the use of most Federal or State funds for roadway improvements is limited to those roadways designated as a Federal Functional Classified roadway. Cochise County updated their eligible roadways in 2014 and these updates were accepted by Federal Highway Administration (FHWA) in early 2015. The study roadway Federal Functional Classification for Cochise County is presented in Map 6.

MAP 6: FEDERAL FUNCTIONAL CLASSIFICATION



- Within the County roadway network, local roads (rural minor and major access roads and minor collectors), account for 816 road miles. Primitive, native surfaced roads within the maintained roadway system account for 520 road miles, or 36 percent of the total County roadway network.
- Major Collectors account for nearly 293.35 miles of the study roadway system; however, included in that total are SR-181, SR-186, and portions of SR-80 east of Douglas. Rural major collectors in the unincorporated county areas total 102 miles, or about 7 percent of the total County roadway network.
- The major thoroughfares, such as SR-90, SR-80 south of the SR-90 junction, and SR-92 east of the SR-80 junction in Bisbee, are classified as Principal Arterials. All other state highways are classified either as a Minor Arterial or a Major Collector.
- As the only U.S. highway in the County, US-191 is classified as a Major Arterial.

Average Daily Traffic Counts

Existing daily traffic count data was obtained from Arizona Department of Transportation (ADOT) and SouthEastern Arizona Governments Organization (SEAGO). Cochise County undertook a county-wide update of traffic counts, in coordination with SEAGO, in 2013. Real-time traffic count data is available on the Traffic Data Management System hosted on ADOT's website.

- The highest traffic volumes in the County are, not surprisingly, located on I-10. As I-10 travels westward from the Arizona/New Mexico Stateline, Average Daily Traffic (ADT) volumes increase from 13,735 to 27,724 just before the Cochise/Pima County line.
- The State Route/U.S. Highway network carry the highest volume of the County's traffic and act as the primarily transportation network for the majority of the County's travelers. For the State Routes, such as SR-80, SR-90 and SR-92, that connect Benson and Douglas, traffic volumes range between 8,700 to 1,700 ADT, while in the vicinity of Sierra Vista, traffic volumes on SR-90 and SR-92 are greater than 12,000 ADT.
- Traffic volumes tend to be higher in the unincorporated areas that are adjacent to Sierra Vista, Douglas and Benson as the area transitions from urban to rural land uses. For example, Hereford Rd. and Ramsey Rd., south of Sierra Vista, have traffic volumes exceeding 4,000 ADT in the vicinity of SR-92.
- Average Daily Traffic (ADT) exceeds 1,000 vehicles per day on 11 percent of the County's transportation system.

Safety Analysis, Monitoring and Recommendations

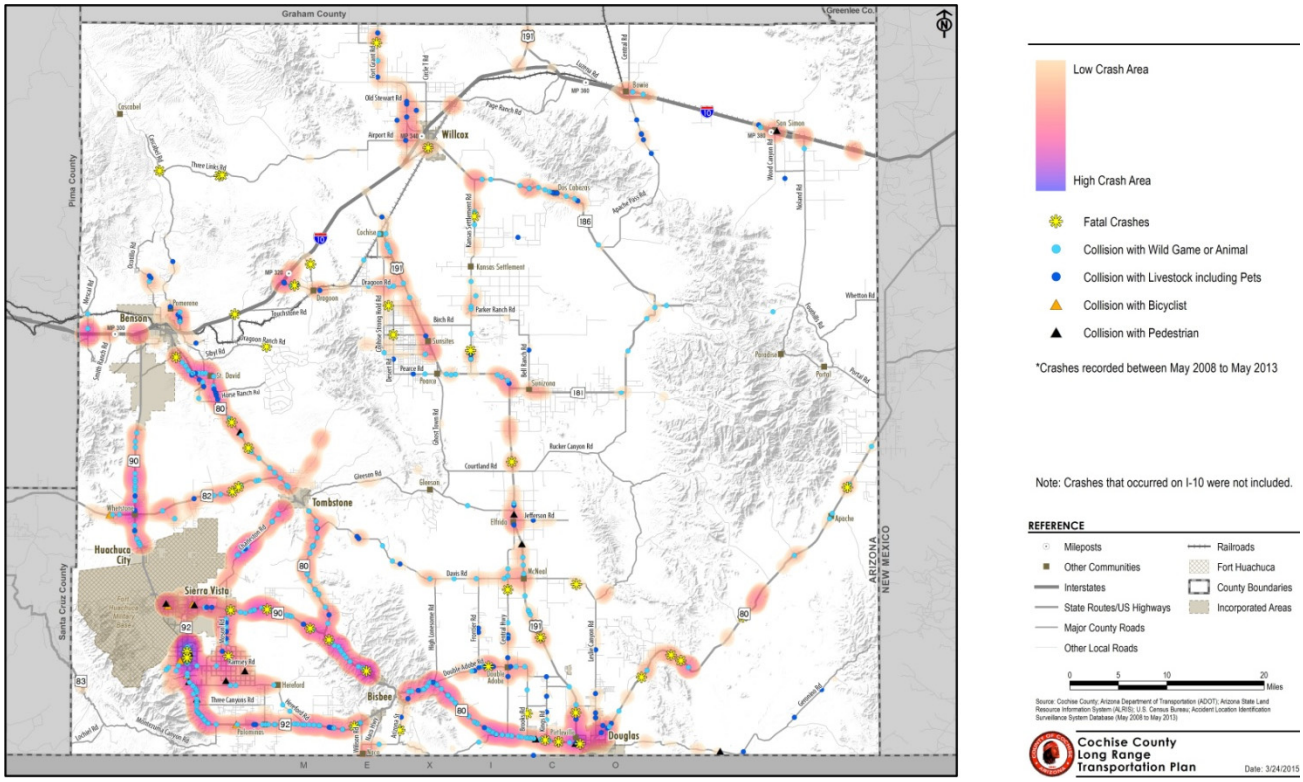
Improving the safety of the traveling public is a significant concern and a priority for Highway Dept. activities. In Cochise County, an average of 4.33 vehicle crashes occurs each day, resulting in 22 deaths and 591 injuries in 2012. 39 percent of these crashes occurred within the unincorporated County area but 76 percent of all fatalities and 37 percent of all injuries were within the unincorporated area. The average crash rate county-wide is .04 percent per 1.000 VMT[7].

Over 22 percent of these crashes can be attributed to two driver errors: driving too fast for the conditions (speeding) and failing to yield. Driver inattention, unsafe lane changes, disregarding signals, following too closely and improper turns collectively account for another 14 percent of motor vehicle crashes. Alcohol may have been a factor in about 5 percent of the 2012 crashes. Delay resulting from the aftermath of motor vehicle crashes can be a significant factor in traffic congestion. Aggressive drivers or drivers in a hurry are not issues that can be solved by infrastructure improvements although engineering improvements have, along with vehicle safety devices like air-bags, lessened the potential harm caused by driver error. The most dangerous time to be driving, based on crash statistics, is late Friday afternoon between 4 and 5 p.m. Motor vehicle crashes had an estimated economic impact in Cochise County of $56.92 million in 2012 including lost wages and productivity, medical expenses, property damage and employer costs.[8]

[7] Data for crashes occurring between May 2008 and May 2013 was obtained from ADOT's Accident Location Identification Surveillance System (ALISS) database for the unincorporated area of Cochise County.

[8] *2012 Motor Vehicle Crash Facts for the State Arizona, ADOT, October 2013*

MAP 7: CRASH DENSITY FOR STATE AND COUNTY ROADS



Compared to urban level fatality and injury rates the raw numbers do not appear to be high; however, compared to an average per vehicle miles traveled, the rural rates are much higher. Tragically, the single vehicle roll-over accidents that occur all too frequently on the County's rural, dirt roads as the result of high speeds and driver inattention are completely preventable by the driver. At this time, by Arizona statue, unsigned dirt roads have a default speed of 65 miles per hour; this speed is frequently exceeded on these rural dirt roads, contributing to the higher than average off road departures resulting in vehicle overturning crashes as well as higher numbers of crashes with animals in the road.

Unique to rural areas are accidents caused by unexpected encounters with wildlife or livestock in the roadway. In Cochise County, this represents an average of 38 crashes per year, a higher percentage than in other counties in the state. A collision with a large mammal, combined with high speeds and rural dirt roads can, and has, led to fatalities. As of the date of this plan, Cochise County, like other rural counties in the State of Arizona are designated as open range. What that means is that within the unincorporated areas of the County, property owners must fence out livestock rather than require, as do all the cities within the County, that owners of livestock must fence them in. The significance of this designation is most apparent for federal, state or county owned roadways. For any given stretch of roadway the duty to fence out any wandering animals falls to the jurisdictional owner of record.

The State of Arizona has developed, and plans to regularly update, a Strategic Highway Safety Plan that provides data, goals and strategies for regional governments and local jurisdictions to incorporate and implement into their own planning processes. Cochise County also collects and

analyzes crash data in order to prioritize future improvements. Other activities undertaken include the following:

- Drainage improvements to eliminate dip-crossing problems, correct local flooding problems and install bank protection.
- Upgrading signing and pavement markings throughout the year.
- Removing sight obstructions and fixed objects from within the clear zones.
- Providing a reasonably smooth roadway pavement with appropriate markings.
- Adding shoulders and recovery/clear zones beyond the traffic lanes to major corridors.

Recommendations for Improving Safety

- Continue to collect, submit and monitor crash data and assess high crash site characteristics.
- Coordinate with SEAGO and all other Cochise County local jurisdictions on the development of a regional safety plan by the year 2020.
- Use crash-related data to develop targeted public information outreach.
- Coordinate with the health department, medical facilities and schools to strengthen driver education and proper safety-restraint (e.g. seatbelts, car-seats) outreach.
- Provide advance public information reports through multiple media outlets alerting the public to adverse weather conditions.
- Use engineering design and traffic calming techniques to reduce speeding in residential areas; especially in areas around schools.
- Proactively address potential sight distance issues during the development review process.
- Reduce the frequency and severity of lane and roadway departure crashes through roadway infrastructure improvements e.g. edge striping with reflective pavement markers.
- Identify and address, when feasible, potential conflicts with bicyclist and pedestrians, in particular, at intersections, railroad crossings and high-volume roadway segments.
- Identify and address, when feasible, potential conflicts with wildlife or livestock and implement improvements to decrease unexpected encounters on the roadway.
- Identify and systematically re-configure flying "Y" intersections throughout the County.
- Partner with ADOT to address improvements to intersections with the state highway system.
- Reduce the default speed limit on dirt roads to a minimum of 45 mph.

EXISTING CHARACTERISTICS, PROJECTED NEEDS AND RECOMMENDATIONS BY TRANSPORTATION MODE

The Cochise County transportation system is primarily a network of federal, state, county and local roadways. Transit and paratransit services are provided by local jurisdictions and various non-profit agencies throughout the County. Although a robust trail system is spread through federal and state owned public recreational lands there are few pedestrian or bicycle routes outside of incorporated jurisdictions. Aviation and Rail services are also an important component of providing passenger and freight movement in and through the County. The sections that follow provide an overview of the existing Cochise County transportation system, with projected needs and recommendations by mode for this 2040 LRTP.

TRANSPORTATION STUDIES, PROGRAMS AND POLICIES

Transportation infrastructure, such as roadways and airports, are obvious elements in a transportation system. However, a complete transportation system includes a number of non-capacity elements such as studies and programs that support the goal of providing a cost-effective, safe and well-maintained transportation network. Studies or planning efforts are intended to develop new programs, or provide further definition to future construction projects. Programs are generally continual or ongoing activities that provide services and information; collect critical planning data; or fund operational costs for transportation systems. Policies provide for overarching direction or advocacy positions that support the development and maintenance of the transportation system.

Other activities of the Cochise County Highway Dept. include issuing permits and inspecting work within the County rights-of-way; issuing oversized load permits; providing updated and maintenance signing and striping on all paved surfaced roadways; conducting nighttime visibility inspections; clearing vegetation within clear zones and routine safety inspections.

Studies

Studies are routinely undertaken to gather critical data, develop plans and coordinate with other jurisdictions for joint projects. Data collection includes traffic counts, pavement condition, bridge inspections. A ten-year Road Needs Study is conducted every few years and a five-year annual work plan developed to guide the Highway Dept. activities. Studies provide reports or plans that focus on issues or make detailed recommendations for future needs. Long-range transportation plans often incorporate the results of other major studies that are separately conducted. Adopted plans provide recommendations for projects that may include cost estimates and potential funding options. Studies are also often needed to justify or prioritize federal or state funding requests. Studies that provided detailed information and targeted recommendations for this 2040 LRTP included: the Northwest Area Plan, Arizona-Sonora Border Master Plan, Cochise County Roads Needs Study, SEAGO Coordinated Transportation Plan, and the I-10: I-19 to SR-90 Corridor Report and DCR.

Throughout the planning horizon of the 2040 LRTP it is anticipated that various study topics would be identified and completed either by County staff or with the assistance of consulting teams. Studies have a wide range of costs and some may be accomplished in a short time frame with costs under $10,000. Typically most studies range in costs from $150,000 to $250,000. Opportunities to fund studies are provided by ADOT (currently through the PARA Grant program) or in partnerships with research agencies or other federal, state, regional or local governments.

Recommendations for the 2040 LRTP Studies

- Update the *Cochise County Roads Needs Study* a minimum of every five years and present findings to the Board of Supervisors on a regular basis. This report provides critical, real-time information to guide short-range project planning and funding decisions.
- *Moson Road Corridor Extension Scoping Study and DCR:* Working with the SV MPO, the first phase of this study effort would develop a project Scope of Work; update right-of-way acquisition costs

and potential construction project costs and identify potential funding sources. The second phase would fully develop a construction design and construction schedule.

- *Colonia Area Circulation Plans and Strategies:* The County has a number of small, dense, urbanized areas that were initially laid out in the late 1800's and early 1900's before vehicle travel became the major transportation mode. Most have unofficial travel corridors, inadequate roadway widths, high pedestrian movement and are often the source of multiple complaints regarding driver behavior or roadways condition. Development in these areas often requires multiple variances from Roadway design standards. A study looking at these areas (e.g. Naco, Winchester Heights, Bowie) to develop specific strategies to address these areas would improve local travel options and circulation in these historic residential areas.
- *Alternative Roadway Stabilization Demonstration Study:* A number of innovative, "green" methods for improving dirt roads have been developed; however, the County has not had the opportunity to fully investigate the possibilities of using any of these methods or training in-house crews to construct or maintain these different types of surfaces.

  Alternative surface treatments like these could be evaluated and used if such surfaces would result in a roadway surface that had a longer lifespan, lower maintenance costs and less environmental impact on the land. Several companies could be solicited to demonstrate various dirt road stabilization and pavement preservation techniques and an evaluation of factors including ease of application, effectiveness of dust control, appropriateness for regional soil types and stability during and after storm events be undertaken. Training of maintenance road crews and private construction companies would be a desired component of any contract for these types of roadway stabilizers. Documentation of these demonstration treatments would be prepared in a report for publication, as current research falls short of providing rural areas a rigorous review of sustainable alternatives to the traditional chip-seal surface treatments.
- *Rural Trip Generation Factor Study:* Working with other rural jurisdictions and the Institute of Traffic Engineers, develop a rural factor for adjusting standardized trip generation factors used for traffic analysis. Developing this factor would improve the quality of traffic review conducted by both the County and developers, increase the accuracy of traffic modeling and reduce the potential for over-building or under-building transportation facilities.
- Additional recommendations for studies are identified by mode in this 2040 LRTP.

Programs

Ongoing programs provide for data collection, managed systems, operational costs, services and information. These activities may be required by legislation or intergovernmental agreements and all are necessary for the safe and effective operation of the existing transportation infrastructure. Inherent in maintaining data is reporting that data to federal and state agencies: state shared revenues and other funding decisions are based on reported data. The County has a number of ongoing programs that meet the needs of tracking the condition of existing infrastructure and working with the public to make neighborhood scaled improvements.

- Bridge and Culvert Inspections: JPA 94-213
- Fencing County Highways Program: Resolution 94-40
- Neighborhood Traffic Management Program: Resolution 03-71
- Public-Private Partnership Program: Resolution 06-48
- County Road Swap Policy (Drop/Add Program): Resolution 07-77

- Roadway Condition Survey
- Sign and Striping Maintenance
- Traffic Counting Program

Most of these programs have been effectively in place for several decades. Review of the necessity and effectiveness of all programs is recommended within the planning horizon of this 2040 LRTP. Several programs require public participation for materials and/or labor costs.

Recommendations for the 2040 LRTP Programs

- Provide a minimum of 1 FTE dedicated staff to monitor and implement data gathering programs.
- Update the Traffic Counting Program by the year 2016; obtain and implement an updated count and reporting process by the year 2017. Estimated cost $25,000
- Update the Neighborhood Traffic Management Program by the year 2020 to include more current traffic calming strategies; clarify neighborhood contribution costs; and, address procedural barriers to the implementation of this program.
- Reconsider the Public-Private Partnership Program: place a moratorium on new projects until the existing project list is completed; clarify partnership roles and costs.
- Reconsider the Fencing Program; potentially add cattle-guards as an eligible activity by the year 2020.
- Standardize the Road Condition Survey and incorporate into the GIS system with a summary reporting tool for use in prioritizing the five-year work plan.
- Develop, as needed, new programs to improve or enhance on-going maintenance or data collection activities.

Advanced Right-of-Way Acquisition

Typically, Right-of-Way Acquisition is part of project pre-design and most urbanized areas or jurisdictions that have incorporated post-1975 have fully perfected rights-of-way for their transportation systems. That is not the case in Cochise County. The early Boards of Supervisors established declared county highways but such declarations did not necessarily transfer actual ownership to the County. A mix of historic declarations, private and public easements, subdivision or township plat dedications and, in some cases, federal or state legislative acts, conveyed the right to use and maintain the County roadway network. By 1990, only 20 percent of the entire roadway network was identified as having perfected right-of-way.

As needs for roadway improvements increased, revenues to address those needs began to decrease and the county began to consider additional federal and state sources of revenues. One primary difference between local revenue expended on a declared county highway and federal or state revenues expended on roadway improvements is that fully perfected rights-of-way are required in advance of any construction improvements.

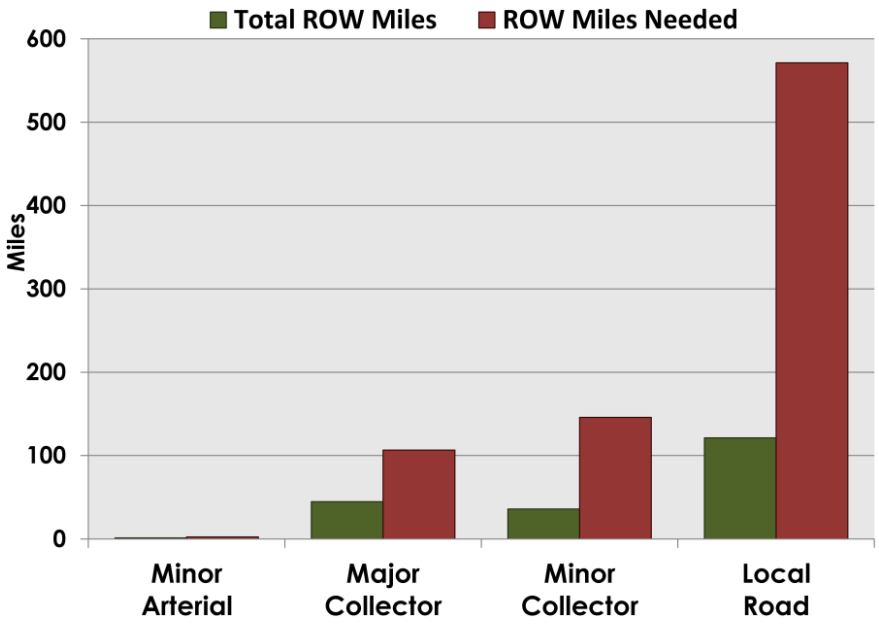
Cochise County began to proactively acquire right-of-way on the County's declared and maintained roadway network and by the year 2000, 43 percent of the roads were perfected and by 2013, approximately 52 percent of the roadway network had been perfected. In

addition, RS2477 claims on Gleeson Rd and Rucker Canyon Rd have been recognized by the State Land Dept. for transfer to the County as qualified historic rights-of-way. An additional 23 road claims have been submitted for review to the Arizona State Land Dept. totaling a potential 400.5 acres of historic roadway easements that would be officially added to the County's roadway network. Development review became more robust in the last five years in regards to requesting right-of-way dedication, when appropriate, from applicants.

A *Right-of-Way Needs Analysis* was completed in September of 1999. This analysis determined that about 825 miles of County maintained roadway was yet to be acquired at an estimated cost, in 2014 dollars, of $9,728,340. Per acre costs were based on 1988 assessed values for that report and generic average costs per acre, estimated at $8,145 per acre, have grown to 2014 costs estimates of $16,259 average per acre. With the additional costs for survey, title and appraisals for each parcel, right-of-way acquisition is not an incidental consideration, either as a developer contribution or as a project design cost. Typically, average costs for pre-acquisition tasks range from $5,000 to $10,000 per parcel. Acquisition of roadway easements through Arizona State Land Department, or other state or federal lands, also have unique mitigation costs related to environmental (including cultural) clearances.

The 1999 Right-of-Way Needs Analysis is included in Working Paper 2: Appendix A

FIGURE 8: ROW NEEDS BY FUNCTIONAL CLASSIFICATION



Obtaining rights-of-way early in the project development process, in particular along corridors where the land is either vacant or being used for agricultural uses, saves time and acquisition costs. Purchasing needed rights-of-way for future corridors during natural turn-over of land through publically offered real estate sales is also a cost effective strategy for obtaining needed roadway and drainage corridors.

Recommendations for the 2040 LRTP Right-of-Way Acquisition Activities

- Update the 1999 *Right-of-Way Needs Analysis* to reflect acquisitions obtained since that time, reassess needed ROW widths and update costs by the year 2016.
- Update the *Right-of-Way Needs Analysis* a minimum of every ten years.
- Complete entry of rights-of-way information into the County's GIS system.
- Complete applications for potential State Lands RS2477 claims by the year 2020.
- Acquire a minimum of 30 miles of rights-of-way for existing roadway network per year.
- Provide a minimum advance rights-of-way acquisition budget for future corridors.
- Provide a minimum of 3 FTE dedicated staff positions for rights-of-way activities.
- Identify and pursue opportunities to acquire rights-of-way for future roadway alignment.
- Identify and pursue opportunities to abandon unused roadway segments.
- Proactively pursue developer contribution of right-of-way during the discretionary permit application process.
- Encourage donations of rights-of-way to the County on existing declared roadways.
- Fully perfect the right-of-way on the County's maintained roadway system by the year 2040.

National Environmental Policy Act Assessment

Infrastructure projects typically have complicated and conflicting impacts on the natural and social environment. Assessing these potential impacts and mitigating negative impacts on the environment is an essential part of any roadway project. Doing so is not only good practice but also clearly desired by the public perspective that Cochise County's historic and natural setting is highly valued and should be preserved to the extent possible.

The use of State or Federal funds for infrastructure projects requires that National Environmental Policy Act (NEPA) requirements are met. This typically includes a biological assessment, cultural resource clearance, preliminary assessment of hazardous materials, water quality and stormwater pollution prevention plans and approvals from a variety of agencies, such as the Corps of Engineers, may be required.

The costs for needed environmental assessments and mitigation are typically included as design costs. These costs range from as little as 2 percent to 30 percent or more of total project costs, and, like Right-of-Way acquisition costs, are not incidental considerations. As growth occurs and the County must make roadway improvements outside of historically maintained widths these initial costs may prove to be substantive both in time and money. The very characteristics that make this County such a desirable attraction for both residents and tourists (it's rich cultural heritage and diverse ecosystems), also result in virtually every single transportation improvement project being located upon, or adjacent to, cultural artifacts or valuable environmental resources.

Naturally occurring flows of water or dealing with intense monsoon storm-water flows are also a frequent concern that must be addressed with roadway projects. Migration and nesting patterns of protected bird species are another factor as are wildlife corridors for rare mammal species, like ocelots. In some cases, such as with correctly placed wildlife crossings and careful consideration of water retention measures, there are long term social and economic benefits

that off-set the up-front costs of mitigation, including decreases in wildlife-vehicle collision rates and reduction of flooding and erosion damage to transportation infrastructure.

In the more developed urbanized areas, roadway corridors have been previously assessed and updates can be obtained and reviewed more quickly. In Cochise County, very few roadway segments have been fully evaluated and most are placed on undisturbed native material. As a result, in most cases, each new improvement project must begin with basic data collection from archeologists and biologists. Proactive support of archeological and biological assessments and studies in future project areas will increase project effectiveness and reduce costs and construction delays in the long-term.

Recommendations for 2040 LRTP Environmental Requirements

- Develop a current NEPA Process Chart to assist with tracking environmental requirements and progress towards Environmental Clearance when implementing construction projects.
- Use available environmental and archeological databases and tools in the project scoping phase.
- Support the addition of dedicated SEAGO and/or SVMPO staff to assist with obtaining and tracking environmental clearance documents.
- Use standard formulas to calculate culvert and crossing structure size and openness ratios that accommodate target species; follow wildlife-friendly fence guidelines; use local scale wildlife corridor mapping that incorporates wildlife movement data and habitat conditions; and implement other standard mitigation recommendations that allow planners and engineers to effectively and easily consider wildlife during the scoping phase of projects.
- Identify key wildlife corridors and plan for wildlife crossings, where appropriate.
- Establishment of future County pathways or recreational facilities, such as parks, should adequately identify and preserve roadway corridors to avoid 404 NEPA impacts.
- Encourage and support biological assessments within the County to increase the known base of information and proactively assess potential concerns, fatal flaws and needed mitigation.
- Encourage and support interdisciplinary research and collaboration to resolve conflicting concerns across multiple archeological, biological and environmental fields.
- Advance archeological studies along known existing and future corridors desired for improvement to jump-start projects when the time is right for construction.
- Consider the recommendations of the *Community Wildfire Protection Plan*, where appropriate, for planning evacuation routes and using roadway design as planned firebreaks in areas at risk of wildfires.

Related Federal, State and Local Requirements

Proposed projects, if using federal or state funds, must be included in the region's Southeastern Council of Government's (SEAGO) Transportation Improvement Program (TIP) or the Sierra Vista Metropolitan Planning Organization's (SVMPO) TIP.

All projects must be constructed in compliance with all required Federal, State and local regulations, as applicable. Cochise County has experience with addressing and complying with Federal, State and local regulations, including those related to the Clean Water Act and Endangered Species Act. Projects within Cochise County do, on occasion, require permits from

the Corp of Engineers as well as 404 permits. Individual roadway projects should be evaluated during the design phase for any permits that may be required from outside agencies.

Legislative Policy Considerations

The ability to effectively implement this 2040 LTRP is, in part, dependant on supportive legislative actions at the federal and state levels. The County works with several lobbying groups; such as, the National Association of County Governments, the Rural Transportation Advocacy Council and the Arizona Transit Association. These organizations work in the County's behalf with national and state elected officials to represent policy positions and advocate for a strong, effective and safe transportation system. Within the next 20 to 30 years there are long-standing policies that may need to be reconsidered and others that are currently a barrier to being effective with available resources.

Recommendations for 2040 LRTP Policy Positions

- *Maintain memberships in lobbying arms of appropriate agencies.* The rationale for this legislative action is to support an active presence at both the national and state levels on transportation related issues.
- *Analyze re-authorizations transportation bill(s) and identify potential new opportunities for funding.* The rationale for this legislative action is to support awareness of not only opportunities but also new requirements.
- *End the diversion of dedicated transportation funding and encourage ADOT to restore the HURF exchange program.* The rationale for this legislative action is that inadequate state-generated transportation revenues, due to diversion of millions of dollars of HURF revenues in the State General Fund, has reduced the flexibility of ADOT to assist local governments in producing smaller rural projects in a cost effective manner.
- *Support expansion of existing dedicated transportation funding sources.* The rationale for this legislative action is that Arizona has not adjusted the gas tax for over 24 years and similarly the federal gas tax has not been adjusted since 1993. Dedicated revenues for transportation are decreasing while costs for transportation are increasing. Sustainable funding mechanisms for critical infrastructure are needed and additional options made available for local governments to self-finance transportation projects.
- *Support exploration of alternate dedicated transportation funding sources.* The rationale for this legislative action is that other innovative revenue streams, not tied to the traditional fuel funding sources, needs to be explore this could include vehicle miles traveled or used tax that would capture revenue from all vehicles including alternative fuel vehicle.
- *Increase the Title 34 Force Account work limitation to $500K (including or excluding the cost of material) and index to keep pace with inflation.* The rationale for this legislative change is to increase the flexibility to use County forces for small projects; current limit ($217K) is insufficient to upgrade a single mile of roadway thus forcing increased costs for contractors to work in outlying rural areas. Many contractors are not interested in bidding small projects in rural areas, and when they do, bids frequently come higher than budgeted because of mobilization costs.
- *Reduce the default speed on primitive dirt roads to 45 mph.* The rationale for this legislative change is to encourage reduced speeds on historic, old roads that have limited maintenance and were constructed without engineering standards thus improving safety for the traveling public. The County Board of Supervisors rejected this change in 2010 as a premature and unnecessary action that would be virtually impossible to enforce. However, within the horizon year of this plan

and the stated strategic goal to emphasize safety for County residents, this issue is suggested for reconsideration by the year 2040. This measure was supported by the Arizona Association County Engineers based on the AASHTO 2001 guidelines for very low volume local roads.

- *Cap the liability limit for the State DOT.* The rationale for this legislative change is to bring ADOT into line with the majority of other states that have reduced their risk and are able to be more flexible with design standards, where appropriate.

ROADWAY NETWORK CHARACTERISTICS & ASSESSMENTS

The existing roadway system is made up of approximately 1,438 miles of County-maintained roadways. Of these road miles, 637 are hard-surfaced and 801 miles are native-surfaced. The legal status of roadways within the County is not the same as the functional classification of roadways, which is an engineering definition related to the design and function of the roadway. The County has four types of roadways, from a legal standpoint, that makes up the maintained roadway system used by County residents.

- Declared County Highways is a route that has been formally designated by the Board of Supervisors as meeting a "public necessity" as set forth in A.R.S. § 28-6705 and 6706. The Board has to weigh the public need for the roadway against the resources needed to construct and maintain the roadway as well as the inherent liability that goes along with a County road. The County currently maintains approximately 773 miles of declared highways.
- Primitive Roads are public roadways but are substandard dirt roads that were constructed and in use prior to 1975. A.R.S. § 28-6705 and 6706 sets out the statutes allowing for minimal maintenance with limited liability for these types of roadways. These roadways are signed warning the traveling public that they are on a roadway that is only minimally maintained. The County currently maintains approximately 520 miles of primitive roadways.
- Subdivision roads are public roadways built after 1975 and constructed to County design standards as part of the subdivision process and paid for by the subdivision developer. This process is described in A.R.S. § 11-802 and 806.1. Once constructed to standards these roads, by statute, must be maintained by the County. The County currently maintains approximately 83 miles of subdivision roadways.
- Other County roads, totally approximately 62 miles, are very old highways that have been maintained for decades, some even established prior to Statehood. A.R.S. §28-7041 states that any roadway existing prior to January 1, 1960, and been used continually by the public for over ten years prior to that, is a declared public highway. For those roadways existing prior to August 12, 1927, per A.R.S. §28-7042 a declared right-of-way width of 66 feet is assumed. Clear title is not conveyed to the County but public funds may be used to maintain these roadways.

An additional 3,000 miles of local roads are not maintained by the County but used by the public. Most of these roadways are substandard, dirt roads and are located on private easements (although some do have public right-of-way such as might be granted through old land surveys). Arizona State statutes allow land developers to construct roads accessing wildcat developments that do not meet County roadway standards. They are not statutorily eligible for publically funded maintenance until they are constructed to county roadway standards at no

cost to the County. However, residents living along these roadways frequently exert pressure on elected officials and Highway Dept. staff to improve and maintain these roads.

This practice creates both a public liability and a political dilemma. The County Highway Dept. has estimated that it would take an estimated $434 million to $1.9 billion to improve these roadways to County design standards and an additional $33 to $64 million to maintain these roadways annually. At this time there are no plans to undertake such an effort within the foreseeable future. Local neighborhoods accessed by such roads must assume joint responsibility for their local roads and drainage needs. A special road and drainage improvement district is one tool available to assist residents in maintaining their own roadways. This 2040 LRTP acknowledges, but does not address, these local roadway needs.

Computer modeling is one tool used to help assess the impact of future growth on the existing transportation system. Capacity transportation projects typically refer to any project that increases the number of lanes available for vehicles, trucks and buses to use. Without additional improvements, but with increases in the number of people using the transportation system, congestion on the roadway network is expected to increase along with average travel times. Improvements can include new lanes but turning lanes, climbing lanes, pull-outs, dedicated deceleration and acceleration lanes, control of access, speed reductions or traffic calming measures can also improve capacity on the roadway system.

Roadway Network Needs and Challenges

The 2008 Roadway Needs Study Update by the Arizona Association of County Engineers found that Cochise County had $387,189,000 in identified needs for Fiscal Year (FY) 2009-2018 and of those, $199,102,000 was needed for upgrading existing rural roads. Expected revenues fall far short of meeting these needs with an estimated total shortfall of 67.66 percent statewide within that same timeframe. Although new roads are also needed, especially those that would create alternate routes, improvements to roadways within the existing maintenance system are a higher priority.

Cochise County has numerous challenges related to the extensive roadway network that serves this large rural community. Possibly the most serious of those is to keep up with the basic maintenance needs of the existing network. Dealing with severe weather related events will continue to be an essential task of the Highway Dept. Looking to the future it will be important to acquire sufficient rights-of-way, identify and provide appropriate mitigation for environmental impacts and provide attractive routes and amenities for the ecotourism industry. International Ports of Entry and freight corridors are essential for the movement of goods to and through the County. Improving safety is a significant concern. And lastly, proactively addressing future infrastructure needs for improvements to roadways to increase capacity, improve safety, provide access and meet the expectations of the traveling public for a safe, smooth ride.

Other considerations related to roadway needs include public health issues such as reducing the negative impacts of pollutants on air and water quality, creating safe spaces for people to walk and interact with each other, developing built environments that support healthy communities and improving connections between people and the places they need and want to go.

All-Weather Access/ Evacuation Routes

Cochise County is located in the northern Chihuahuan Desert, a hot, arid region that experiences two distinct rainy seasons: summer (July-August) "monsoons," characterized by heavy rainfall in a short time accompanied by intense thunder and lightning; and the winter (January-February) rains that bring steady precipitation over the course of 1-3 days.

Drainage issues due to significant intermittent flows and sheet flooding across roadways are common County-wide, periodically closing roadways, stranding residents, and preventing access to emergency service providers. The flood hazard areas of the County are also subjected to periodic flooding, which may result in loss of life and property, threats to public health and safety and disruption of commerce and government services. By incorporating drainage improvements to convey, at a minimum, a 5-year storm event, along with mitigating impacts of potential 100 year flood events, essential all-weather access and safety would be substantively improved. Higher functional classified roadways should ideally provide drainage improvements for the 10-year storm events (minor collectors) or 25-year storm events (major collectors and arterial roadways). Alternative routes for emergency situations, including flooding events, should be identified and those roads be prioritized for all-weather access improvements.

Performance Assessment (Build vs. No-Build)

By 2040, vehicle trips are expected to increase by over 33 percent. Although the types of transportation options were projected to remain the same in the 2040 transportation model, there will simply be a lot more people traveling in different ways around the region: walking, bicycling, and using some form of a transit system, driving alone or in carpools as well as trucks delivering goods to households or businesses.

The planning process uses projected data to assess the impact of future population, employment, major destinations and other traffic congestion data onto the Cochise County street network. The process also looks at the impacts of growth in the areas if no new transportation improvements were made – this is called the "No Build" analysis. This modeling technique takes the existing transportation system network and then asks the question "What will happen to our transportation system in the future if we do not build any more capacity projects?" The results of this analysis are then compared to a scenario that includes all the additional improvements proposed in the 2040 LRTP.

The 2010 base year model results indicate that less than 1 percent of the County roadway network is currently experiencing severe or heavy congestion (occurring peak travel periods principally on the Interstate). From the year 2010 to 2040, vehicle-miles traveled are expected to increase by 8.3 percent, while vehicle-hours traveled are anticipated to increase by 10.5 percent. Total average daily travel, excluding neighborhood (local) streets, for the year 2040 is estimated to be 5,678,928 miles for the no-build condition.

Estimated vehicle hours and vehicle miles of travel in the year 2040, with plan improvements, are described in the Table 9.

TABLE 9: PERFORMANCE MEASURES RESULTS

Performance Measure	Year 2010	Year 2040 No-Build	Year 2040 Build (with Plan Projects)
Weekday Vehicle Hours Traveled (VHT)	95,091 Hours	105,058 Hours	104,634 Hours
Weekday Vehicle Miles Traveled (VMT)	5,242,498 Miles	5,678,928 Miles	5,671,841 Miles
Vehicle Miles Traveled per Person	39. 9 Miles Daily	34.7 Miles Daily	34.6 Miles Daily
Vehicle Hours (in Minutes) Traveled per Person	43 Minutes Daily	38.5 Minutes Daily	38.3 Minutes Daily
Average Network Speed (mph)	55.1 mph	54.0 mph	54.2 mph

Vehicle Hours and Vehicle Miles Traveled: With Plan Improvements
Typical Weekday VHT and VMT (excludes travel on local streets)
Source: Cochise County Travel Demand Model, July 2014

I-10, SR-90 and SR-92 are the most traveled roads in the County. Since the system wide improvements were minimal, it is to be expected that the effect will also be nominal. However, a reduction in vehicle miles and vehicle hours traveled can be noticed between the No-Build and the Build scenarios. This is validation that the improvements and the development of alternative routes will be beneficial to the residents of Cochise County. County-wide averages in the model also minimize the benefits realized by drivers within the specific area of the improvements themselves.

These modeling statistics reflect average daily travel county-wide and the forecasted travel demand is for the mid-link roadway section, which means the mid-point between intersections As a result, congestion in more urbanized areas is frequently under-estimated, especially during peak travel times because it begins at intersections. Peak hour travel reflects the majority of travel to and from work or other regular activity trips. Usually if the mid-link traffic volume is near capacity that means that most likely the intersection is operationally deficient. Intersection characteristics and specific geometric configuration change the operational analysis outcomes: individual operational analyses should be conducted for potentially deficient intersections.

Level-of-Service (LOS) is the planning performance measure used in helping to identify system roadway capacity deficiencies. In Cochise County, the 2040 LOS analysis did not identify any major capacity deficiencies. Most of the roadways performed at LOS A-B, which represents low congestion, with the exception of a section of SR-92 north of Hereford Road and a section of Smith Ranch Road south of I-10, both which display moderate congestion. Due to the rural nature of the County, and the large amount of unpaved roads, special attention should be paid to the traffic volumes and relative thresholds warranting improvements to ensure the safe travel of the County residents.

As might be expected, Vehicle Miles Traveled (VMT) both continue to rise, with the number of miles traveled in the region more than doubling by the year 2040. In 2010, the base year for the model, the combined Interstate and state highway traffic accounted for an estimated 77 percent of total VMT. By the year 2040, almost 45 percent of the total VMT in Cochise County will be on Interstate 10. Adding in the state highway system brings this number to over 79 percent of total VMT; reflecting the increasing amount of traffic that will be carried by the State's roadway network in the future. The fact that almost 80 percent of all the County's vehicle trips are on the

state highway system emphasizes the interdependence between the federal, state, County and local jurisdiction roadway networks to provide efficient mobility to County residents.

Air Quality Assessment

The Clean Air Act Amendments of 1990 require that 2040 LRTP activities not cause or contribute to any new violation of any standard in any area, increase the frequency or severity of any existing violation of any standard in any area, or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Cochise County is currently in attainment with the health standard for Carbon Monoxide (CO) under the Clean Air Act. Implementation of this LRTP program is not anticipated to cause or contribute to a violation of the CO NAAQS during the period covered by the plan. Improved emission standards and newer vehicle fleets will continue to help to reduce the CO emissions in the future. Although at the local County level, levels of CO emissions appear to be under control, at the national level the Environmental Protection Agency (EPA) has issued an official endangerment finding related to concentrations of pollutants known to be caused by transportation related impacts. Following that EPA endangerment finding, regulations were then developed limiting minimum emissions from new motor vehicles beginning in the 2017 model year. Transportation corridors that concentrate emissions may become an issue of concern in future years but are not anticipated within the horizon year of this 2040 LRTP.

In addition to monitoring CO levels, air quality levels for five other pollutants are also monitored on a regular basis by the Department of Environmental Quality (ADEQ) for adherence to the NAAQS. Those pollutants include the following:

- Ozone (O_3): Cochise County is in attainment with the 8 hour health standard for ozone. An O_3 monitor is planned to be located within the Sierra Vista MSA by January 2016 in order to assess if additional monitoring within the urbanizing County areas are needed.
- Sulfur Dioxide (SO_2): Cochise County is in attainment with this standard and there are no monitoring stations for this pollutant in Cochise County at this time.
- Particulate Matter (PM_{10} & $PM_{2.5}$): Cochise County has one air quality non-attainment area, located in the lower southeast area of the County, west of Douglas along the Paul Spur Rd. In 2008, this area violated the 1987 24-hour PM_{10} health standard. Two roadways (Central and Brooks) are proposed for improvements in the LTRP within three miles of this site. The non-attainment status of this area is related in part to quarrying of limestone and the intensive truck activity of the Chemical Lime Company of Arizona, Douglas Plant located directly on Paul Spur Rd. Currently the Chemical Lime site is classified as moderate nonattainment for the PM_{10} standard. Cochise County has already chip-sealed Paul Spur Rd to reduce the negative impacts of air-borne particulates in this area; however, this roadway is a high-priority for continued maintenance activities. Monitors are also located at the Douglas Red Cross site although this site is currently in compliance with the standard. The Douglas area PM_{10} and $PM_{2.5}$ monitors will also be used to satisfy the requirements for monitoring these pollutants for the Sierra Vista MSA.
- Lead (Pb): Cochise County is currently in attainment with this standard and there are no monitoring stations for this pollutant in Cochise County at this time.

In addition to monitoring these specific pollutants ADEQ has set up several metrological network sites within Cochise County to monitor regional haze/visibility both from urban activities as well as from unique natural events. These monitors are located at the Douglas Red Cross site and at the U.S. Forest Service Chiricahua Entrance Station.

Recommendations for Maintaining and Improving Regional Air Quality

- Prioritize improving to a hard surface any native-surfaced roadway within three miles of the PM_{10} nonattainment site.
- Ensure that dust control plans are prepared and implemented for construction projects (roadway as well as residential and commercial developments).
- Prepare and update regularly a Natural Event Air Quality Action Plan.
- Participate with ADEQ on the EPA Border Program: U.S. - Mexico Border Air Monitoring Working Group.

Existing and Future Transportation System Characteristics

Key Cochise County transportation system statistics include:

- Between 2009-2013, an average of 77.1% of workers 16 years and older drove to work, 10.8% carpooled, 4.9% walked, 4.4% worked from home, 0.5% used transit and 2.3% used other means.
- The reported average travel time to work in 2010 was 19.1 minutes.
- The most travelled roads in the County's system, exceeding 4,000 vehicles per day, are Hereford Road and Ramsey Road, south of Sierra Vista.
- The rural roadway network covers vast areas served by unimproved roads; frequently with one access point that may become impassable in bad weather.
- Only 34 percent of the vehicles miles traveled in the County occur on non-state owned roadways; the state maintained facilities function as the County major arterial and collector system.

Transportation and Economic Corridors

Based on 2040 out-year modeling, the following corridors are anticipated to be the most significant corridors in the County's transportation network. Linking incorporated jurisdictions, key tourist or commerce sites and connecting the international border, these eight corridors are a priority for preserving existing infrastructure, scheduling for improvement and maintenance.

- Central Hwy.
- Charleston Rd.
- Davis Rd.
- Dragoon Rd.
- Fort Grant Rd.
- Kansas Settlement Rd.
- Moson Rd.
- Naco Hwy.

Along with these major future corridors, both international Ports of Entry, located within the incorporated area of the City of Douglas and in the unincorporated area of Naco, are significant traffic generators that provide for the movement of international freight and visitors into and through the County. It is anticipated within the horizon year of this plan that improvements to both Ports of Entry will be undertaken to facilitate projected increases in rail, truck, passenger vehicle and pedestrian travel.

Recommendations for Transportation and Economic Corridors

- Declare these future corridors for the future out-year roadway widths and prioritize for advance right-of-way acquisition.
- Seek opportunities to conduct scoping studies, corridor studies or design concept reports for these future corridors.
- Develop parking and pedestrian facilities adjacent to the Ports of Entry to support cross-border pedestrian travelers.
- Participate in local Ports of Entry or International Border planning projects; support recommendations of the 2013 *Arizona-Sonora Border Master Plan*.

Access Management

As the County's transportation system grows to accommodate additional modes and future growth, it becomes important to maintain the functional integrity of the transportation network. A key component to doing so is the development and adherence to an Access Management Plan. Establishing a system of access categories that are consistent with the functional classifications of the County's roadway network help to guide decisions about the level and type of access allowed throughout the transportation network. A reasonable balance between the needs of public safety, regional mobility, system connectivity with adjacent land uses and development is thus improved.

Components of an Access Management Plan include determinations of location, types and design of encroachments onto a County roadway. To some extent, the County's driveway design standards provide a minimum level of access management control. However, at this time, those standards are not tied to roadway functional classification and, although the County's Comprehensive Plan states overarching guidelines protecting the various classifications of roadways, the County does not at this time have strong regulatory controls providing criteria for the different types of roadways within the County's maintained roadway network.

Both on the County's system, and on the State highway system, a number of older, grandfathered access points limit bringing all of our roadways into compliance with best practices of access management. The higher the functional class of the roadway, the more critical it is that access management controls be applied. As additional access cuts are made, increases in turning movements then occur; speeds begin to slow and eventually, over time, a high speed arterial or major collector roadway will begin to function as a minor collector. In those cases, the roadway should be downgraded, posted speeds reduced, traffic calming techniques applied and the roadway will then begin to function as an urbanized local roadway rather than a connector between major destinations. However, if too many roadways are

compromised, regional connectively will suffer, average travel times will increase, crash rates may go up and, in extreme cases, state highway corridors will become local collector roadways. Fry Blvd, in the Sierra Vista area, is a case in point: a former state highway, this roadway became impacted by so many development driven access points that it could no longer serve its original purpose and was abandoned back to the local jurisdiction.

Recommendations for Access Management

- Enforce existing design standards for new access locations and design during the development review process.
- Obtain, in appropriate locations, no access easements to control future development access points; prioritize access control and no access easements on existing and future corridors.
- Support the Access Management requirements and specifications on the state highway system to ensure the continued functionality of the County's high speed, major arterial transportation roadway network.
- Update driveway access requirements and specifications in the County's *Road Design & Construction Standards & Specification for Public Improvements*, by the year 2018.
- Develop a County-wide Access Management Plan by the year 2040.
- Where appropriate, purchase grandfathered access rights and decommission non-compliant access points.

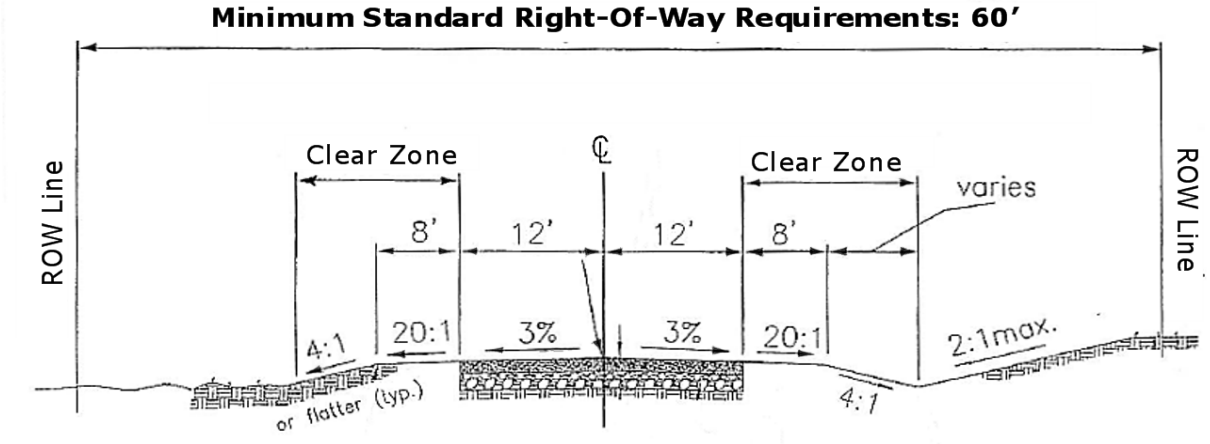
Preliminary Engineering (Design and Specifications)

Over time, Cochise County has developed specific standards that are localized for regional soil types and weather conditions. County roadways currently follow the Road Design & Construction Standards & Specification for Public Improvements, last revised October 11, 2005. The existing Rural Local Road Standard is shown in Figure 10. Clear Zone Requirements conform to AASHTO Roadside Design Guide, 2002, Chapter 3.

Drainage improvements should meet the standards described in the Floodplain Regulations for Cochise County, effective July 30, 1984, subsequently amended in 1987, 2000, 2002 and, most recently, on January 29, 2013. Resolution FCD 13-01. Design standards for culverts and channels are set forth in the HDS No. 5, Hydrologic Design of Highway Culverts and HEC-14, Hydrologic Design of Energy Dissipater for Culverts & Channels. Current County standards call for roadways to be designed, at minimum, to carry the 5 year storm-water flows under the roadway; higher functional classed roads should carry the estimated 10 or 25 year storm-water flows. The 100 year storm event should be contained in an overflow/dip section with the depth of the flow crossing the roadway not to exceed one foot at any point within paved sections.

The typical scope of work for each local roadway segment improves each identified section to a 20-24 foot cross-section, built up with 4 inches of select fill and 6 inches of Aggregate Base (AB). Subgrade would be compacted to a minimum of 95% of maximum dry density and AB compacted to 100% of maximum dry density. Actual depth of fill and AB would be determined by soils test of the subgrade material. Drainage issues would typically be addressed with two 36 foot diameter corrugated metal pipes, large wash crossings hardened with Asphalt-Concrete (AC) and concrete curbs with 1,000 feet of exit channels per mile, where appropriate. Right-of-way, if not already dedicated, is typically perfected before major improvements are made.

FIGURE 10: STANDARD COUNTY DESIGN FOR RURAL LOCAL ROAD (D-102)



Treatment surfaces include:

- Double Bituminous Surface Treatment (DBST) over an Aggregate Base (AB) with a protective overlay of rubberized asphalt or protective payment surface to extend the life of the underlying chip-seal.
- Double Bituminous Surface Treatment (DBST) or other alternative hard pavement surface over Aggregate Base (AB) and/or compacted native material.
- Built up and compacted native road surface with a soil stabilizer and protected drainage ways to reduce erosion and improve all-weather access.

Cochise County's existing Design Standards were adopted over a decade ago during a time of high growth rates in both the State and in Cochise County. Therefore, design standards were selected that emphasized faster development than actually occurred with a slant towards a more urban infrastructure using design standards from the metropolitan areas of Phoenix and Tucson. Development projects are expected to conform to the adopted Design Standards at the time of final design and construction. It is anticipated that roadway and floodplain standards would be revised and updated over time.

Since the adoption of the existing County Roadway Standards, design techniques to address very low volume roads, rural native surfaces roads, and remote recreational area roads have been investigated by federal, state and tribal agencies. FHWA began developing a concept for "context sensitive solutions:" which suggested integrating adjacent land uses in the development of roadway design. There is a dynamic interaction between transportation infrastructure and the human and natural environment that surrounds it. There are equally as many undesirable impacts to over-constructing a roadway as there are to a substandard roadway. Cochise County's Roadway Design Standards currently reflect a desire for an urbanized, and integrated, transportation system.

However, within the horizon year of this 2040 LRTP, existing standards are beyond the engineering design standards necessary for many of the County's roadways as determined by existing and out-year traffic volumes, crash data and land uses. In addition, with available resources and staffing levels, meeting existing Design Standards throughout the County's maintained roadway network is impossible to achieve.

Therefore, the foundational finding and recommendation of this 2040 LRTP is that the existing Roadway Design Standards be amended to include very low volume, context sensitive and rural roadway standards. In additional, major and minor collector roadway standards should be re-assessed for minimum right-of-way width requirements and consideration for access management, alternative modes and drainage structures be taken into account in the next update.

Several conceptual roadway design standards were developed as part of the 2040 LRTP effort. These can be used as the basis for an engineering and operations analysis to develop a standard suitable for the diversity of Cochise County's rural roadways. Theoretically, such a design standard could be used to convert existing, but deteriorating, chip-sealed roadways to improved rural dirt road standards as well as upgrading higher volume primitive roads with materials and an improved cross-section.

Conceptual Design Standards are illustrated in Working Paper 2: Figures 3.2; 3.3 and 3.4.

Recommendations for 2040 LRTP Preliminary Engineering and Design Specifications

- Update the *County's Roads Design & Construction Standards & Specification For Public Improvements* to be completed and adopted by the year 2018.
- Develop a design standard for rural, low volume, context sensitive roadways to guide both private and public construction and maintenance of local roads.
- Develop a design standard for an improved local road that is maintained at a higher level than a native-surfaced primitive road but is not fully improved to a chip-sealed surface.
- Investigate the use of soil cements, binders or polymers in lieu of extensive Aggregate Base placement for use on appropriate roadways.

Roadway Project Schedule

Weather conditions constrain work with chip-seal projects to mid-April through the beginning of the monsoons, typically in July and from mid-August through the beginning of October. Projects are typically staged during the off-season months and, where appropriate, design-build techniques used to compress construction schedules. Right-of-Way acquisition, surveying, design, engineering, and road base preparation are all activities that are typically conducted during the winter and monsoon months throughout the year.

Natural weather events, such as wildfires, flooding, blizzards, high winds and dust storms also can significantly impact project schedules and needed work tasks. Responding to emergency conditions, as well as repairing roadway and drainage infrastructure after severe adverse weather events, are resource and staff intensive activities. Although emergencies and unusual weather conditions are inherently unexpected, the frequency of such events in recent years indicates a need to proactively prepare for these diversions from the planned Highway and Floodplain maintenance and construction activities.

The 2040 LRTP is a long-range conceptual plan, not a committed capital improvement plan, and although projects are anticipated within the horizon year of this plan numerous factors, including realization of growth rates, rebounding of economic vitality, federal and state commitments to funding, will influence the implementation timing of any given project.

Chip-Sealed Roadways

Best practices for the preservation of chip-sealed roadways are that they be given a fresh chip seal surface at least every 7 years. Higher volumes roadways should be renewed every 5 or 6 years. A number of factors contribute to pavement deterioration including traffic volumes, vehicle types, average travel speeds, roadway geometry and poor drainage conditions. Over time weathering, in particular the heat of the desert summers, also causes the chip-seal to become brittle and break-up. Once cracking begins water will begin to work its way under the pavement surface causing potholes and surface disintegration. Chip-sealing, a practice on virtually all of all the County's hard surfaced roadways, is basically a graveled roadway painted with a protective coat of asphalt and rock chips. Such a roadway surface has little structural strength and is typically used only to protect the underlying base from moisture and dust. Over time, chip-sealed roadways must also be reconstructed.

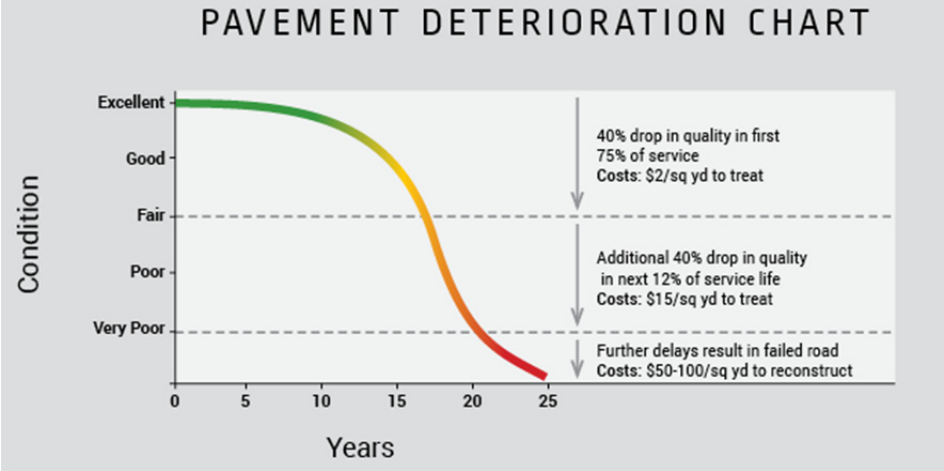
To adequately meet a basic maintenance cycle for the current hard-surfaced roadways in the County's roadway network a total of 193 lane miles of paved roadways needs to be resurfaced each year; 27 lane miles would need to be reconstructed each year. Fully staffed Highway Dept. crews can complete approximately 6 lane miles per day. However, resurfacing costs have increased 42% in the last ten years to an estimated $60,950 for 6 lane miles in 2014. To accomplish the necessary maintenance cycle, not including reconstruction activities, on the County's hard-surfaced roadway network at least $11,764,000 is needed annually.

These resources not being available in recent years, the cycle for maintaining hard surfaced roadways has increased. By FY2014-2015, only 105 lane miles could be scheduled for maintenance treatment and only 1 lane mile for reconstruction. This schedule is a 12.6 year cycle, not a 7 year basic maintenance cycle. The loss of roadway surfaces has already begun on some roadways and by the year 2025 it is anticipated that hundreds of lane miles will have failed. **At the present rate, an estimated 592 lane miles (about 46 percent) of existing paved roadways are anticipated to disintegrate and revert back into dirt within the planning horizon of this 2040 LRTP**.

Roadways currently unraveling include Central in the Bowie area; the Mescal subdivision; the Naco Townsite and the Bay Acres Subdivision. An estimated $684,000 was identified to reconstruct these 14.7 failing roadway miles. These roadways are the first of an exponentially increasing list of roadways that are expected to fail within the next decade. It should be noted that all of these areas are within the lower income areas of the County indicating an undesired cycle of deferred maintenance in these historic residential areas.

Roadways that have been improved to higher standards, with a prepared base and several inches of asphalt-concrete, initially have higher construction costs but do have longer lifecycles. However, even these will deteriorate within 15-20 years and will then also need to be fully reconstructed. A pavement deterioration chart over time is presented in the Figure 3.5. Investments in capital improvements, without adequate maintenance cycles, will provide several decades of improved traveling conditions but without maintenance activities can be expected to eventually fail. As seen in Figure 11, a roadway can appear to be in adequate condition but then suddenly drop from good to poor condition within a matter of a year or two.

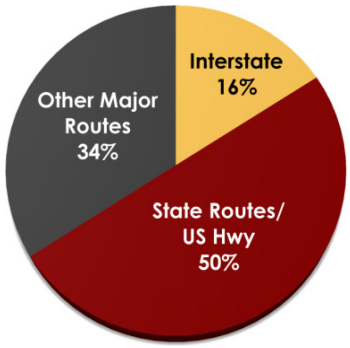
FIGURE 11: PAVEMENT DETERIORATION CHART



Note: Of the existing 340 AC lane miles and 987 chipped-seal lane miles: 14.7 lane miles are currently in failing condition.

The excellence of earlier chip-seal efforts, along with rigorously meeting maintenance cycles in the past, has given the County a period of grace with the roadway network, an illusion that roadway conditions were holding up. However, now the delayed maintenance cycles, necessary under budget constraints, have brought many roadways near the brink of failure requiring full reconstruction to recover the roadway. Within the planning horizon of this plan, without additional resources, Cochise County can anticipate maintaining chipped-sealed surfaces on only the major corridors and to a minimal standard.

State Highway System: Given that 50 percent of the County's vehicle miles traveled occur on the state highway system, coordinating improvements, especially those intersecting with County maintained roadways, is important both to leverage state funds to improve the County's roadway system but also to enhance resident's travel experience. Significant work is anticipated on I-10 including widening sections to six lanes, adding climbing lanes, re-building intersections, creating/reconstructing one new Interstate connection near the Skyline traffic interchange and replacing bridges. State highway work will include widening sections to four lanes, adding passing lanes, widening shoulders and improving drainage.

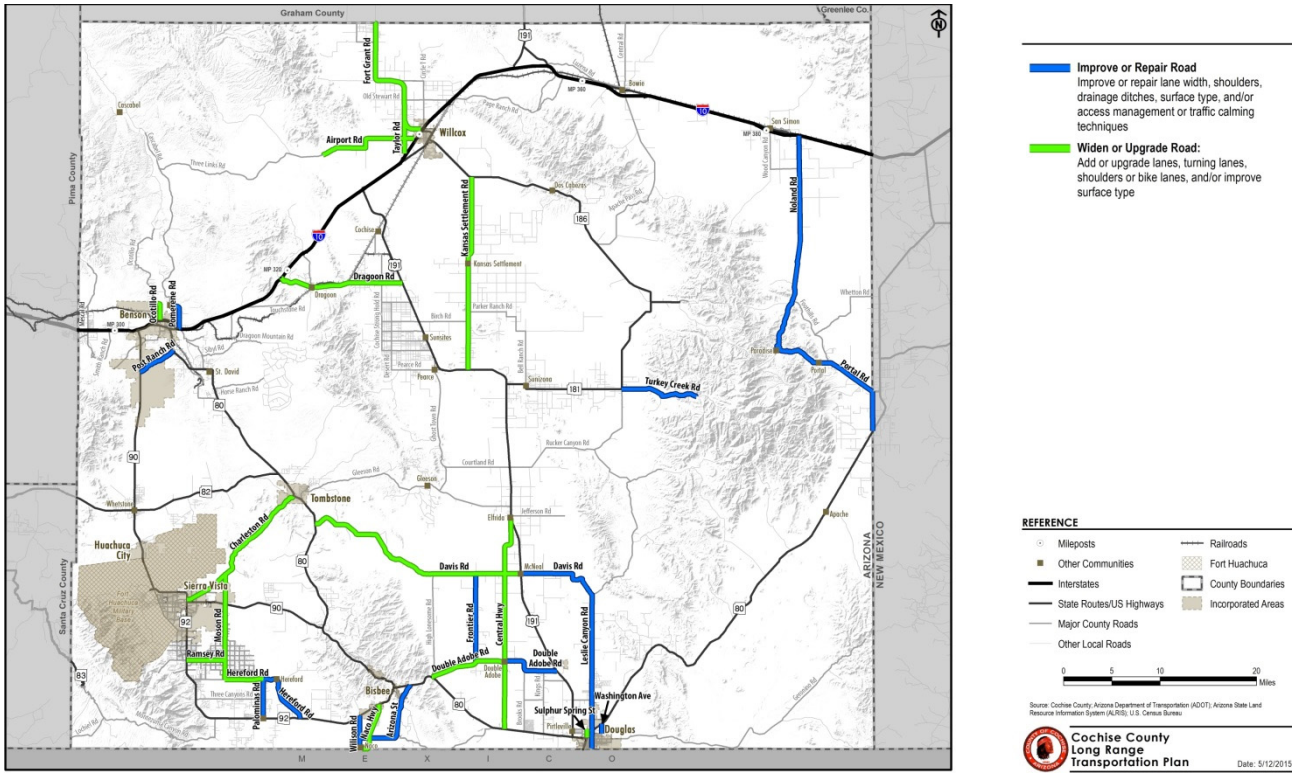


This 2040 LRTP touches upon but does not fully address the Federal Interstate or State highway improvements. However, it should be noted that the Federal and State transportation revenues are currently insufficient to meet the Safford District's basic maintenance needs. Planned improvements on the state highway system are dependent on future funding and partnerships with regional and local agencies as well as private developers. There are no major state highway improvements located in Cochise County in the current ADOT five year state transportation improvement plan.[9]

[9] The 2016-2020 ADOT Plan estimates $23.7 million dollars of investment for the SR92 San Pedro Bridge repair, BST/Hatfield intersection improvement, Cochise TI improvement, Rockfall mitigation at the Bisbee tunnel and pavement preservation activities on Bowie I-10B and SR90.

Future Capacity improvements, Upgrades or Improved Roadways: Based on existing and out-year traffic volumes, crash data, projected growth, development plans, previous capital improvement plans, missing links, and completed studies, a number of roadways were identified for improvement, upgrade or roadway extensions. Roadway improvements are distinguished from maintenance activities by the nature and extent of the work. In the context used in the 2040 LRTP, capacity improvements means that new lane miles are constructed either as a new roadway connection or as additional new lanes.

MAP 12: RECOMMENDED UPGRADES AND IMPROVEMENTS



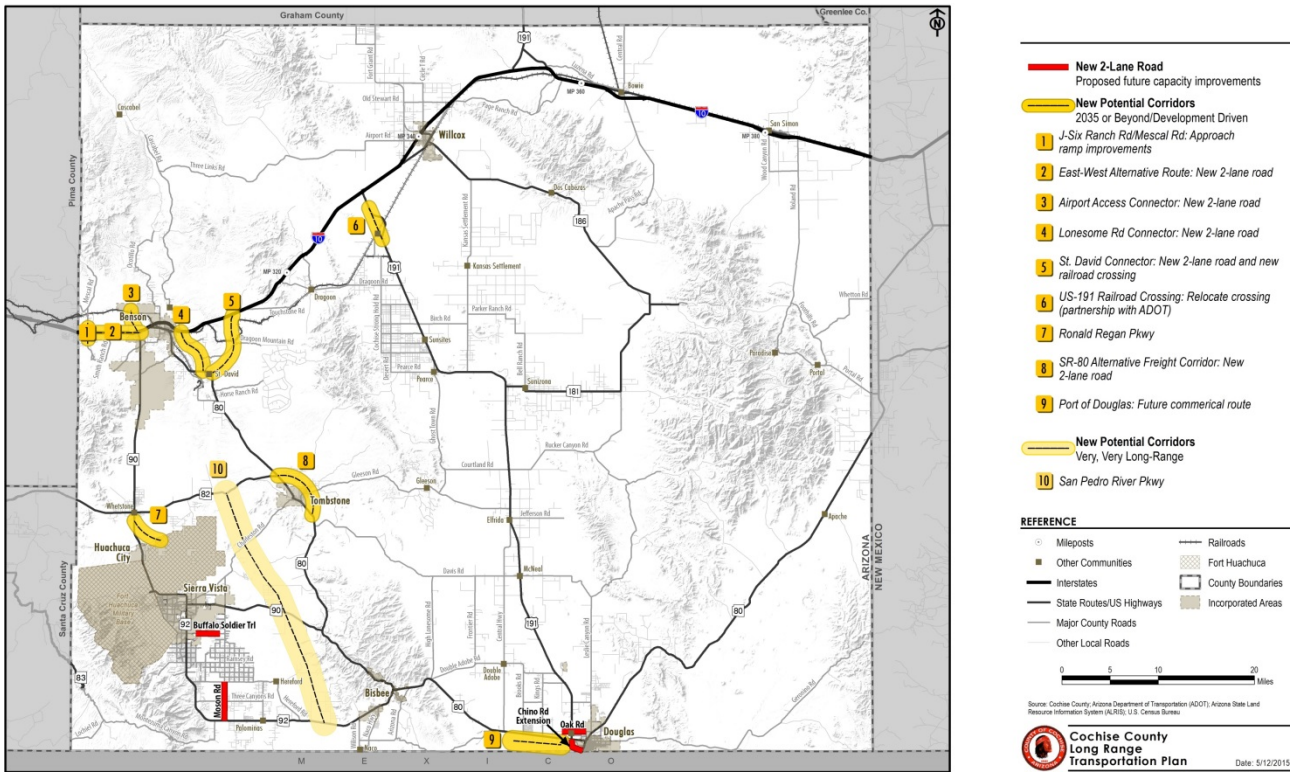
Upgrades means potential changes to roadway alignments, adding lanes, adding turning lanes, adding shoulders or bicycle lanes, significant repair or upgrade of the roadway surfacing, repair/replacement of wash crossings or drainage structures, repair/replacement of unstable sub-base materials or stabilization of shoulders. Upgrades may bring a roadway closer to a higher capacity design standard by correcting spot substandard or unsatisfactory conditions; prevent failure or deterioration of a roadway segment or drainage structure; or enhance the traveling conditions for alternative modes. Upgrades also serve to phase in improvements as a roadway is brought from current conditions to a future desired condition identified as needed in the out-year of this 2040 LRTP.

Improvements means repair and correction of unsatisfactory lane widths, addition of native surfaced shoulders, improve or add drainage ditches, improve surface type by adding material or pavement stabilizers, add access management or traffic calming techniques. Improvement of a roadway may also serve as a phased project towards a future upgrade of that roadway facility when future conditions warrant them.

These identified improvements do not include future potential corridors that are fully dependent of development occurring, along with associated development contributions, or if the need for the corridors appeared to fall outside the 2040 planning horizon. These potential corridors are mapped in order to begin very preliminary assessments of those future needs as well as to track relevant data that would alert the County when the appropriate thresholds for these future corridors begin to move beyond a conceptual stage to desired new connections. Potential new roadways and future corridors are shown in Map 13.

Within the planning horizon of this 2040 LRTP only six major capacity improvements have been identified and all are likely to occur towards the end of this planning cycle. However, scoping those projects, proactively obtaining right-of-way, beginning the clearances required and identifying adequate funding are all pre-construction activities that could begin immediately.

MAP 13: RECOMMENDED CAPACITY IMPROVEMENTS



Recommendations for 2040 LRTP Roadway Improvements

- Analyze and prioritize hard-surfaced roads by traffic volumes, perfected ROW, types of uses, safety and air quality concerns for milling back any remaining chip-seal and converting to an improved native surfaced roadway.
- Coordinate intersection improvements with ADOT, with state funded improvements on the state highway.
- Support ADOT access management and driveway standards to maintain the state system as a high volume, limited access, major travel corridors.
- Improvements to Pomerene Rd

- Improvements to Hereford Rd
- Improvements to Palominas Rd
- Improvements to Willson Rd
- Improvements to Purdy Ln/Arizona St connection.
- Improvements to Frontier Rd
- Improvements to Double Adobe Rd from Central Hwy to US-191
- Improvements to Leslie Canyon Rd
- Improvements to Washington Ave from SR-80 to Douglas City Limits
- Upgrades to Ft Grant Rd (Willcox area)
- Upgrades to Airport Rd (Willcox area)
- Upgrades to Taylor Rd (Willcox area)
- Upgrades to Dragoon Rd (Cochise Stronghold area)
- Updated to Kansas Settlement Rd (Northeast area)
- Upgrades to Sulphur Springs Rd (Pirtleville area)
- Upgrades to Central Hwy (Douglas area)
- Upgrades to Double Adobe Rd from SR-80 to Central Hwy (Southcentral area)
- Upgrades to Naco Hwy (Southcentral area)
- Upgrades to Ocotillo Rd (Sierra Vista/Tombstone area)
- Upgrades to Moson Rd (Sierra Vista area)
- Upgrades to Ramsey Rd (Hereford area)
- Upgrades to Hereford Rd (Hereford area)
- Expansion of Ocotillo Rd from the Benson city limits to Aviation Dr to four lanes (Northwest area)
- Expansion of J-Six Ranch Rd/Mescal Rd. approach ramps to Interstate 10 (Northwest area)
- Extension of Buffalo Soldier from SR-92 to South Moson Rd (Sierra Vista area)
- Extension of South Moson Rd from Hereford Rd to SR-92 (Sierra Vista area)
- Extension of Oak Ave, including associated bridge, from the Hospital at Kings Rd to Sulphur Springs St (Douglas area)
- Completion of Chino Rd/3rd St from SR-80 to U.S.-191(Douglas area)
- Relocating and reconstructing Davis Rd; U.S.-191 to Central Hwy (Elfrida area).
- Participate, develop and review scoping studies for out-year potential corridors.

Native Surfaced Roadways

In the early 1900s, the County's roadway system was primarily native-surfaced roads, with travel speeds of 25 to 35 mph, and a different traveler perspective of what conditions were tolerable for comfort and all-weather access. A century later, new residents moving into rural parts of the County often have little understanding of the costs of paving roads, controlling storm-water damage or the drawbacks of dirt roads. Most are muddy when it rains, and dusty and wash-boarded when dry. Many are completely impassable during the summer monsoons and winter rainy season.

Many of these roads have been in existence and routinely bladed for over a hundred years. The results of wear and tear of traffic, and the effects of wind and water, have seen the loss of fine grained materials and the lowering of the road surface several inches below the adjacent ground. Virtually all of the dirt roads in the County's maintenance system need additional materials added to the roadway surface and need reshaped to establish drainage. Ideally, higher volume dirt roads would be bladed 24 times a year with a 7.5 year cycle of reshaping - approximately 23 roadway miles annually. Lower volume dirt roads (<50 ADT) should ideally be bladed 18 times a year with 10 yearly cycle of reshaping - 12 roadway miles annually. Primitive roads should be bladed, ideally, 4 times a year with a 25 yearly cycle of reshaping - 21 road miles annually. Over the entire dirt road system, blading should be occurring on a 3.5 week cycle. It should be noted that reshaping activities have not occurred on the existing dirt road system as there has historically not been enough resources to undertake this work.

In recent years, the cycle for blading dirt roadways has increased so that in FY2014-2015 dirt road blading was anticipated to average every 6 weeks, with reshaping of an estimated 24 roadway miles (with no added materials). This schedule is less than half of what is needed to adequately maintain the native-surfaced roadway system. The inability to adequately reshape compromised native-surfaced roadway means that they will become increasingly difficult to drive, drivers will avoid rutted areas thus broadening lanes beyond desired widths, storm-water will divert into roadways and become impassible during adverse weather events.

The costs to upgrade a dirt road to chip-sealed surfaces range between $145,000 to $300,000 per mile depending on drainage needs, design speed and if the project can be done by County forces or must be done under contract. Limits to capital improvement projects that can be performed with County roadway crews results in higher costs for hiring outside contractors. To chip seal all of the County's 801 miles of maintained dirt roads, as was intended under current Roadway Design Standards, would cost an estimated $116 to $240 million in 2014 dollars.

The County had identified a need for improvement to 155 miles of designated primitive roads during a grant proposal in 2009. The application was not successful and the funds not awarded. However, the proposal was an extensive effort to identify the key primitive roads for future improvement, should funds become available. Proposed project roads are currently unimproved native soil surfaces with no drainage enhancements. Stretches of rough, washboard surface conditions hamper travel, causing excessive wear on vehicles, and create large volumes of airborne dust. These conditions make roads less accessible to those with disabilities and less attractive for alternative modes, like bicycles.

2009 Proposed Dirt Road Improvement List in included in Working Paper 1: Table 3.9

Identified project roads are also important cattle and ranching routes, allowing area ranchers access to markets. The reductions in vehicle and truck damage due to poor roads are substantive and these proposed improvements contribute to the long-term sustainability of these land uses. The connection between these farms, orchards, vineyards and ranches with not only national interstate corridors but also international ports is critical to this nation's ability to feed itself – not only well but cost effectively.

Recommendations for the 2040 LRTP Native-Surfaced Roadway System

- Prioritize dirt road improvement list by traffic volumes (>250 ADT), perfected right-of-way, types of uses, safety and air quality concerns.
- Analyze County dirt roads for surface materials and drainage needs; prioritize based on traffic volumes, safety, air quality concerns and types of soils to select roads for adding materials and reshaping in order to enhance drivability during adverse weather.
- Identify roadways for potential full or partial abandonment that are carrying less than 50 ADT, are providing limited residential or ranching land uses, are under single property ownership, have no perfected right-of-way, do not serve a need for public hiking or bicycling connections, and are unlikely to have significant development growth warranting continued maintenance activities.
- Improve and provide prioritized maintenance on Brooks and Central Ave roadways (within three miles of the PM10 violation site) by the year 2020.
- Increase staffing, equipment and resources for materials to meet or exceed minimum blading and reshaping schedules.
- Improve Post Ranch Rd to an adequate standard to facilitate east-west connection between the Benson/ St. David area and the Whetstone/Sierra Vista area.
- Improve Norland Rd through Paradise to Portal Rd to facilitate recreational travel connections from the San Simon area to Douglas.
- Improve Turkey Creek Rd and associated bridges, to facilitate recreational travel connections to the Coronado National Forest.

Maintenance and Preservation of Roadway System

Maintaining the investment in the infrastructure that already exists is a priority of this 2040 LRTP. Operations and maintenance of both the existing system and the new improvements are critical to the effectiveness of the regional roadway system and help to reduce roadway hazards inherent in the disintegration of roadways over time. They also maximize the resources available as routine maintenance can extend the functional life of a roadway significantly.

It is important to note that maintenance of hard-surfaced roadways cost more than maintaining dirt roads. Maintenance costs vary from $1,000 to $8,400 per mile, per year, over and above that of maintaining dirt roads. These costs include refreshing striping, replacing reflective pavement markers, repairing and replacing signs, repairing and crack-sealing of the surface.

While it may make sense to upgrade to a chipped-sealed surface when traffic volumes are greater than 250 vehicles per day; has a positive effect on improvement safety for roads with 300 to 350 vehicles per day; and reaches the economic optimal threshold at 405 vehicles per day it should be noted that **savings accrue not to the County but to the vehicle driver.** Those savings accrue to County residents in reduced wear and tear on their vehicles and improved travel times. Rough roads are estimated by the American Society of Engineers to cost households an average of $360 a year in higher costs along with reductions in income when they cannot get to work.

The maintenance plan needed to meet basic maintenance needs of the County's roadway and bridge system with minimum maintenance cycles would require at least 116 equipment operators (68 more than existing levels) with additional staff costs of $2.36 million per year. Additional equipment and materials costs needed are estimated to be $4.60 million per year. Total resources needed for a basic maintenance program is about $14 million annually. With existing revenues basically one-half of that amount the County is facing a stripped down roadway maintenance program that will not be adequate to preserve the existing system into the future.

Wayfinding is needed for a fully complete travel experience. Providing adequate signs, not just basic regulatory signs, but also directional, informational, or educational signs are important elements of the transportation system. In a large County with many unique economic and tourist destination sites having standardized pull-outs, some with amenities, provide an additional safety feature as well as an enhancement to the roadway corridor. Connecting these pull-out sign locations to new technologies for information links, hot spots, geo-caching sites or other features to enhance the traveling experience are future amenities to provide, along with the routine aspects of annual upkeep to the transportation network.

Non-capacity and maintenance activities also include costs directed to maintaining, restoring and operating the various components of the roadway system such as posting dynamic and static message signs, covering electric costs for shared jurisdictional traffic signals or street lighting, crack fillings/sealing, repairing curbs and gutters, filling potholes, replacing aging or damaged guardrails, re-striping and sign upgrades or replacements. Litter pickup, graffiti abatement and other site and bank improvements, like weed removal, fall into this category.

Vegetation removal to preserve travel lane widths and sight distance are critical annual activities as are roadside mowing and seasonal snow removal. Re-seeding disturbed roadside areas with native plant mixes and providing natural erosion control should be included in every construction project with appropriate maintenance support, especially for landscaping enhancements along pedestrian facilities. As technological advances occur over the timeframe of this plan it is anticipated that Intelligent Transportation System improvements, such as coordinated traffic signal timing and flood warnings, will become part of the routine operating costs of the Highway Dept. These types of activities are critical to the effectiveness of the County's roadway system and help to reduce roadway hazards of the infrastructure system over time.

Recommendations for the 2040 LRTP Maintenance Program

- Build up the capacity of the Highway and Floodplain Department staffing, including the training of staff to replace pending retirements, to meet basic maintenance needs.
- Continue to replace and upgrade County signs to meet current and future MUTCD standards; monitor nighttime reflectivity on a regular basis.
- Upgrade and maintain striping from 4 to 6 inches on major and minor collector roadways, using reflective pavement markers on both center and edge striping where nighttime off-road departures frequently occur.

- Use traffic calming striping techniques in areas where widening is cost prohibitive or traffic volumes do not warrant it but speeding and/or sight distance are of concern.
- Design and implement roadway and pathway lighting in compliance with the County's lighting code balancing the viability needs of the traveling public with the preservation of dark skies.
- Routinely conduct vegetation removal and tree trimming to provide clear sight distance and reduce wildfire fuels along roadways.
- Provide re-seeding of native grasses, wildflowers and shrubs in areas of project disturbance to assist with erosion control, deter off-road travel and enhance the visual aspects of both pedestrian and vehicle travel corridors.
- Develop an iconic Cochise County sign standard and identify, potentially as part of a future Pedestrian Plan, locations for directional, informational, or educational signs and/or pull-outs.

BRIDGE AND CULVERT CONDITIONS AND RECOMMENDATIONS

Storm-water drainage and maintenance of bridges is an important part of keeping the regional transportation system connected. The San Pedro River and its major tributaries flow heavily during the annual monsoon season and bridges must be constructed to withstand significant flooding, as well as periods of dry heat. Many of the County's bridges and culverts are very old, some are deteriorating and replacement needs to be planned and programmed. Annual bridge inspections and an on-going program to maintain, repair and reconstruct bridges are a critical component of this 2040 LRTP.

Flood hazard areas of the County are subject to periodic flooding that has the potential to result in loss of life and property, health and safety hazards, disruption of commerce and government services along with the need for extraordinary expenditures of funds for flood protection and repair of damaged infrastructure. Obstructions caused by blockage of washes or poorly designed or maintained drainage structures can cause increased flood heights and velocities resulting in damage to the drainage structure and adjacent land area. The County has formed a Flood Control District, which has adopted Floodplain Regulations (last amended January 29, 2013), that describes the activities and regulations providing for the protection of the natural floodplains, steam channels and washes. Construction of any drainage structure that has the potential to reconfigure a delineated floodplain or change hydraulic conditions requires additional study and be designed to withstand a minimum 5 year storm-event for local roads and a 25 year storm-event for higher level collector roadways. Although adverse weather conditions cannot be completely planned and accounted for, it is the intent of any roadway design to maintain or restore natural flow patterns as much as possible. Achieving all-weather passage on all roads with the County's maintained system is not within foreseeable future funding. Only on major, high traffic volume roadways should drainage structures sufficient to meet 50 or 100 years storm events be considered.

The State, following FHWA guidelines, defines a bridge as any structure that spans 20 feet or more, including drainage structures, like box culverts. The County's roadway network includes 59 bridges (structures over 20 feet in length), 632 culverts and 145 low water crossings: most are currently in satisfactory to good condition.

TABLE 14 : BRIDGE AND CULVERT DEFICIENCIES

Structure Name	Road Name	Location	Sufficiency Rating	Condition	Deficiency Classification	Eligible for Federal Funding
San Pedro River Bridge	SR 80	MP 298.79	69.85	Fair	Structurally Deficient	Yes
Tombstone Canyon Bridge 1	SR 80	MP 333.27	67.45	Fair	Functionally Obsolete	Yes
Brewery Gulch Traffic Interchange Overpass	SR 80	MP 341.42	94.23	Good	Functionally Obsolete	No
Fairbank Southern Pacific Railroad Overpass	SR 82	MP 61.47	53.90	Fair	Structurally Deficient	Yes
San Pedro River Bridge	SR 90	MP 328.64	69.84	Fair	Structurally Deficient	Yes
San Pedro River Bridge	SR 92	MP 340.56	46.22	Poor	Structurally Deficient	Yes
RCB	US 191	MP 63.07	61.01	Fair	Structurally Deficient	Yes
Middle March Creek Bridge	Pearce Rd	0.72 mile west of Ghost Town Trl	49.29	Poor		No
Cave Creek Bridge	Portal Rd	0.31 mile east of Cathedral Rock Rd	54.24	Fair	Functionally Obsolete	Yes
San Simon River Bridge	Noland Rd	0.31 mile north of Rivers Rd	52.61	Fair	Structurally Deficient	Yes
W Turkey Creek Bridge #2	Turkey Creek Rd	1.33 miles east of Sunglow Rd	48.69	Poor		No
W Turkey Creek Bridge #3	Turkey Creek Rd	0.65 mile west of Saulsberry Trl	49.63	Poor	Structurally Deficient	Yes
Black Draw Bridge	Geronimo Rd	3.37 miles west of Guadalupe Canyon Rd	42.73	Poor	Structurally Deficient	Yes
Sycamore Creek Bridge	Geronimo Rd	0.86 mile west of McDonald Ranch Rd	46.07	Poor	Structurally Deficient	Yes
Desert Wash Bridge	Leslie Canyon Rd	0.35 mile north of Hunt Canyon Rd	50.15	Fair	Structurally Deficient	Yes
White Water Draw Bridge	Rucker Rd	0.91 mile north of Leslie Canyon Rd	25.28	Poor	Structurally Deficient	Yes
Leslie Creek Bridge	Leslie Canyon Rd	1.00 mile west of Big Bend Creek Rd	36.95	Poor	Functionally Obsolete	Yes
Desert Wash Bridge	Hereford Rd	0.25 mile south of Highlands Ln	54.91	Fair	Structurally Deficient	Yes
Desert Wash Bridge	Sulfur Springs St	0.01 mile south of Merrit Ave	80.59	Good	Functionally Obsolete	No
Turkey Creek Bridge	Paradise-Portal Rd	0.01 mile east of Turkey Creek Rd	44.27	Poor	Structurally Deficient	Yes

*Sufficiency Rating: < 50 = Poor Condition (major repairs or bridge replacement may be warranted); 50 to 80 = Fair Condition (some significant repairs or replacement, such as deck or girders may be necessary); > 80 = Good Condition (no need for any structural repairs)

**Deficiency Classification: Functionally Obsolete: Inadequate dimensions (horizontal and vertical clearances); Structurally Deficient: Structural problems with the deck, superstructure, or substructure Source: ADOT Bridge Group, December 2013

Bridges are evaluated about every two years with a sufficiency rating ranging from 0 to 100, with 100 being the best condition and 0 being the worst condition. Federal funds may be used to replace bridges that are rated less than 50 and to rehabilitate bridges that are structurally deficient or functionally obsolete that are rated between 50 and 80. Within the 2040 plan horizon, it is anticipated that approximately 17 bridges will need to be replaced as well as 11 arch culverts, 97 culverts and 9 low water crossings.

Recommendations for the 2040 LRTP Bridge and Culvert System

- Coordinate with the ADOT Bridge group for ongoing inspections of bridges and culverts: request and obtain scour inspections when needed.
- Routinely clean out overgrown vegetation impeding heavy storm-water flows and re-enforce gabions, scour-floors, headwalls and other drainage structure support as needed in advance of the summer monsoon season.
- Maintain adequate storm drainage ditches to handle storm water runoff along roadside to deter storm-water from working its way under paved surfaces or ponding on natural surfaced roadways.
- Provide for proactive protection measures on older bridges with evidence of head-cutting, bank deterioration or changes in the floodplain increasing storm-water flows.
- Plan to replace or substantively repair a minimum of 2 bridges annually.
- Plan to replace or substantively repair a minimum of 5 arch culverts, culverts or low water crossings annually.

TRANSIT SYSTEM CONDITIONS AND RECOMMENDATIONS

There are several types of public transit systems operating in the County; however, none are owned and operated by Cochise County directly at this time. The primary fixed route transit system within the County is operated by the City of Sierra Vista, which operates solely within jurisdictional limits. Transit services, and other private venders operating shuttles and taxi type services, address the transportation needs of residents with disabilities, older adults, low income and those who cannot or chose not to drive. The most cited use of transit services is for transportation to medical facilities (health care needs), followed by access to shopping, appointments and, to a lesser degree, access to jobs or job training.

Private providers, such as local taxicab services, can play a significant role in transporting elderly and disabled County residents. New technologies are also connecting riders with rides through Smartphone applications like those used by Uber and Lyft.

Intercity Bus Systems: Greyhound Bus Lines provides daily service to both east and westbound destinations along I-10: stations are located in the cities of Willcox and Benson. There are also several private transit operators that provide daily intercity bus service. Many tourism activities benefit from numerous touring groups that bring out visitors by vans, shuttles and tour buses to local orchards, vineyards, historic or birding sites reached using the County transportation network.

TABLE 15: TRANSIT PROVIDERS IN COCHISE COUNTY

TRANSIT PROVIDERS IN COCHISE COUNTY				
PROVIDER	**SERVICE AREA**	**VEHICLES**	**ANNUAL RIDERSHIP**	**TYPE OF ROUTES**
CCS Douglas Rides	City of Douglas Elfrida area	6	41,511	Four (4) deviated, fixed routes with one route to Elfrida provided one day a week, every other week.
City of Benson	City of Benson St. David area	2	6,750	Deviated, fixed route with para-transit to greater Benson area.
Bisbee Bus	City of Bisbee Naco area	3	23,563	Deviated, fixed route with inter-city route to Naco area.
SV Vista Transit	City of Sierra Vista Fort Huachuca	13	186,242	Fixed route with a central transit station with para-transit services.
Agency for the Handicapped	Private: Clients Services within Cochise County	8	28,000	Vocational transportation and client services for developmentally disabled.
Douglas ARC	Private: Clients Services within City of Douglas	9	36,495	Vocational transportation and client services for the developmentally disabled
Huachuca City	Huachuca City to Sierra Vista - Vista Transit Center	2	1,140	Primarily for low income, elderly and disabled clients to access Sierra Vista services and transit routes.
Mary's Mission	Private: SEAGO region	3	24,000	Client services for educational, vocational, medical and recreational travel needs.
Northern Cochise Community Hospital	Greater Willcox area inc. Bowie, San Simon, Sunsites	4	6,432	Demand-response services for medical transportation needs.
Volunteer Interfaith Caregiver Program	Western portion of Cochise County based in Sierra Vista	0	250/500	Private vehicle transportation for elderly and disabled.
Women's Transition Project	Private: Client Services in Bisbee	2	931	Residential care transportation services for clients.
Wynne Chapel	Pearce/Sunsites, Richland	0	144/300	Demand-response services for transportation requests.
2013 Totals		**52**	**355,864**	

Source: SEAGO Coordinated Transit Plan, 2013

Cochise County Area Transit Needs: Coordinated planning efforts are focusing on enhancing communication between agencies and transit riders, development of mutual aid agreements, and addressing administrative barriers to cost effective services such as insurance, training, and documentation requirements. The need to develop partnerships so that economies of scale can reduce costs for maintenance and fuel purchases was also identified. Identified transit needs in the SEAGO 2014-2015 Transportation Coordination Plan included:

- Connecting service between Douglas, Bisbee and Sierra Vista
- Connecting service between Huachuca City and Sierra Vista
- Connecting service between Tombstone and Sierra Vista
- Connecting service between St. David and Benson
- Connecting service between Elfrida and Douglas
- Periodic service from outlying areas to Willcox

By 2040, transit needs are projected to be focused within the incorporated jurisdictions and will likely continue to be most needed by the elderly, disabled and low-income. It is not projected that high density residential areas will be linked to clustered employment centers: a typical feature of cost-effective transit systems. **Therefore, it is not recommended that the County plan to become a direct transit provider during this planning horizon**. However, proactively partnering with existing and future providers to support their activities would leverage limited resources to meet the needs of the transit dependent population groups within the County.

Local match requirements for Cochise County non-profit and jurisdiction agencies providing transit services vary from $6,000 to $14,000 for capital purchases valued at $28,000 to $67,000. Operating expenditures currently require a 50 percent match requirements and these requests typically run from $30,000 to $50,000 per agency.

Recommendations for the 2040 LRTP Transit System

- Provide staff and data support to the SEAGO Transportation Coordination Plan updates.
- Provide mandated public notices, coordinated county-wide, for annual grant application processes.
- Sponsor Train the Trainer and other training programs within the County for transit service providers.
- Develop and adopt IGA's with transit providers and non-profits with federal or state (e.g. 5300 prgram) funded fleets for evacuation and emergency services.
- Develop infrastructure connections for transit stops; where appropriate, request residential and commercial developers to plan for and provide transit stops.
- Assist with match funds to eligible non-profits for the current 5310/5311 or other state-funded transit programs for planning activities, shelters, buses and/or operating expenses.
- Coordinate with fleet management to provide required maintenance and repairs for 5310 vehicles on ADOT liens that serve unincorporated Cochise County residents.
- Work with private transportation vendors to provide real-time services to regional general aviation airports and major employment sites.
- Support AZTA: the state-wide transit advocacy organization informing state elected officials of the priority needs of the transit dependent and transit choice riders.

BIKEWAY SYSTEM CONDITIONS AND RECOMMENDATIONS

The Perimeter bicycling organization, one of several that provide bicycling events and competitions within the County, calls the Cochise County Cycling Classic "the jewel of the Perimeter Bicycling events as it offers the most scenic route around southeastern Arizona where the west is still wild". High adventure and extreme competitive races (over 100 miles in length) are sponsored by organizations like the Greater Arizona Bicycling Association; VBT Bicycling Weekly vacation; Bicycle Adventures; Cycling Escapes as well as the Pacific-Atlantic Cycling Tours. The provision of improvements for bicycle travel is considered an important quality of life measure that helps not only the tourism and recreational aspects of alternative mode travel but also improves accessibility and transportation efficiency within Cochise County. Bicycle facilities and programs provide many public and private benefits that include maintenance of air quality standards and provision of low-cost transportation alternatives.

The development of a future bicycling facility must take into account at least three types of riders:

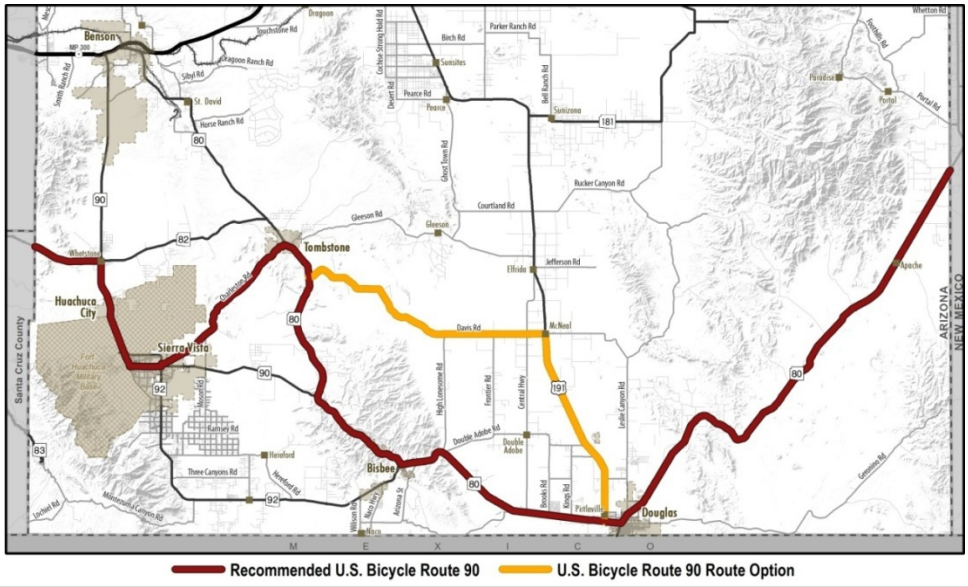
- The commuter rider seeking high speed, striped and signed designated bikeways shared with the roadway, designed for the semi-professional bicyclist, for access to employment, shopping or other destinations;
- The leisure rider seeking slower speed, shorter distance routes located off the roadway, designed for the less experienced bicyclists, as a dedicated or shared pathway; or
- The recreational rider seeking challenging distance routes for events or competitions, training and qualifying rides or pleasure jaunts across the County. Some recreational riders are professional racers; others seeking mountain bike trail experiences.

Prioritizing which facilities to construct, in what order and with what types of amenities is a matter of debate even among the bicycle advocates themselves. As bicycle facilities are constructed, frustration can initially be high among users as missing links are slowly filled in (often giving the initial impressions of pathways that go "nowhere"). Within the horizon year of this plan, with current funding constraints, a complete bicycle system is unlikely to be in place. However, beginning the process toward identifying bicycle routes, coordinating and expanding existing facilities, preserving future bicycle corridors, developing design standards, establishing trailheads and developing bicycle enhancements are desired and within reach.

At the time of this long-range plan, facilities for bicycle travel are primarily located within the incorporated area of Sierra Vista. Signing of bicycle routes that intersected with County enclaves had been undertaken but no bicycle route plan has been developed. Cochise County has one designated bicycle route under development in the 2014-2015 timeframe:

- Cochise-Vista Bicycle Path: approximately 14 miles in length traversing both the City of Sierra Vista and portions of unincorporated County: begins at Buena High School, head westward to Ranchos Carmela, and then southward to Ramsey Canyon Road. This path incorporates multi-use path sections, striped bicycle lanes, and local streets.

MAP 16: U.S. BICYCLE ROUTE 90 RECOMMENDATIONS



On the national level, a U.S. Bicycle Route (USBR) system is under development to link cycling facilities across urban, suburban and rural areas. Scenic, cultural and recreational areas are key destinations for this future designated bicycle route. Working with ADOT and local bicycle advocates, the AASHTO Task Force overseeing this effort has made recommendations for a USBR 90 through Cochise County. Portions of this potential route, along with proposed alternative routes, are located on an estimated 50 miles of county-maintained facilities.

At this time, these USBR designations are solely an identification of a connecting network of preferred bicycling routes and no infrastructure enhancements are planned or funded. Jurisdictions have not been asked nor will be required to improve these facilities to enhance bicycle travel; however, it is hoped that this national planning effort, backed by national, state and local bicycle advocates and elected officials, will generate funding opportunities for future improvements. This designation also reflects a national consensus, in coordination and with agreement from local bicycle groups, of Cochise County routes that are of highest priority for enhancing for bicycle travelers.

Goals for enhancing bicycling within the County include:

- Education: Educate all road users, especially bicyclists, on legal, predictable and safe behavior.
- Enforcement: Enforce all traffic laws on bicyclist and motorists, especially those relating to bicyclist-motorist interactions.
- Engineering: Plan, design, construct and maintain bicycle and multi-use facilities that meet or exceed standards and guidelines.
- Encouragement: Encourage the increased use of bicycles for transportation and recreation.
- Etiquette: Educate drivers and bicyclists of proper use and best practice guidelines for different types of bicycle, multi-use and recreational facilities.

Bikeway systems include four primary facility types:

- Bike Routes: Designated bicycle routes on the street, with signing only.
- Bike Routes with Striped Shoulder: Designated bike routes on the street with painted white lines and signs, or with signs only.
- Bike Lanes: Designated for the exclusive use of bikes only.
- Bus Shared-Use Lanes: Special lanes where bicycles share use with buses and right turn lanes.

Minimum widths are typically 5 feet for a bicycle lane. Cyclists typically ride between 2.5 and 3.5 feet from edge of pavement or curb. Maintenance of the paved, marked shoulders are important to maintain safe speeds for the cyclists and to keep them from swerving out in to the vehicle lanes to avoid debris or poor pavement surface conditions. Bicycle parking facilities and other amenities attract bicycle riders, control where bicycles are parked and prevent unintended blockage of walkways or streets. Encouraging private development to include these types of facilities, as well as placing them in public locations, supports an integrated system of alternative mode travel options.

Recommendations for the 2040 LRTP Bicycle System

- Develop and adopt a County Bicycle Route plan and map.
- Develop and adopt standards for bicycle racks and support facilities to encourage use during the development review process.
- Encourage the addition of bicycle racks as part of development, where appropriate.
- Encourage and support the addition of designated bicycle routes on the state highway system.
- Participate in the development of the US Bicycle Route 90 through the Cochise County segment and support route selection with appropriate Board action (such as a Letter of Support or a Resolution).
- Widen and appropriately stripe paved shoulders following current AASHTO *Guide for Development of Bicycling Facilities.*
- Provide railroad and cattle guards warning signs for bicyclists; follow the *Manual on Uniform Traffic Control Devices* (MUTCD) standards for proper bike lane signing.
- Provide, where appropriate, share use path etiquette/best practices welcome and courtesy signs, along with public outreach, to educate pathway users on how to share the pathway among different types of users.
- Provide one FTE staff person to focus on alternative mode travel issues; including bicycle route development, seeking and managing grant and private funding and supporting bicycling events and activities throughout the County.
- Create and support a stakeholder group that brings together the advocacy groups for bicycling, pathway and trails to develop joint recommendations and prioritize future projects.

PEDESTRIAN SYSTEM CONDITIONS AND RECOMMENDATIONS

Every transportation trip includes a pedestrian element to it. Connections between vehicle trips, transit rides, even bicycle and equestrian facilities, begin and end with a person walking to their final destination. Pedestrian facilities are critical elements of a safe and livable community and include sidewalks, crosswalks, pedestrian overpasses, pedestrian street lighting, design features to enhance the pedestrian environment (e.g. shade trees, benches) and median refuge areas. Pedestrian facilities provide important connections to other ways of traveling as well as access routes for people who cannot or do not wish to drive to places of employment, shopping and other destinations.

Goals for enhancing pedestrian amenities typically include:

- Educate officials and the public to become aware of pedestrian issues, encourage walking and hiking, on legal and safe behaviors for both drivers and pedestrians.
- Promote the development and design of pedestrian paved and unpaved pathways and trails that are direct, safe, comfortable, interesting, and provide continuity.
- Improve pedestrian visibility and safety; design and construct facilities to meet standards.
- Promote the enhancement, improvement, and maintenance of a pedestrian system.
- Identify and secure funding sources to implement pedestrian programs and projects.

Bicyclists are allowed on shared use pathways, but must adhere to strict rules of use when pedestrians can reasonably be expected to be present. These tend to be recreational shared trails or paths that are separated from the roadway and are frequently seen along river corridors that cannot be developed due to floodplain constraints. These paths are used by a wide variety of recreational users, including skateboarders, in-line skaters, scooters as well as joggers and visitors to the area. Table 17 identifies potential pedestrian facilities that have previously been considered, but have yet to be constructed.

TABLE 17: POTENTIAL FUTURE PEDESTRIAN FACILITIES

TYPE OF FACILITY	ROAD NAME	LENGTH in MILES	FROM	TO
Multi-Use Path	SR-92	2.0	Buffalo Soldier Trail	Yaqui
Multi-Use Path	Jefferson St	1.0	US-191	Valley Union HS
Sidewalk	Washington Ave	1.0	Bay Acres area	North of Douglas
Multi-Use Path	Ramsey Canyon Rd	2.0	SR-92	Brown Canyon Trailhead
Recreational Trail	Murray Springs	2.3	San Pedro House	Murray Springs
Sidewalk	St. David Area	Varied	St. David School	Connecting Roadways

One federal program supporting both bicycle and pedestrian use is the Safe Routes to School program (now incorporated into the MAP-21 Transportation Alternatives Program). This program works closely with neighborhood communities and local school officials to improve student's safety and access to their neighborhood school by developing route maps, bicycle and pedestrian safety projects, training programs for teachers, enhanced enforcement measures and safety, educational and promotional materials. Construction of projects near and adjacent to schools to improve access have been identified and completed. Similar programs in other localities have seen dramatic increases in school trips by walking, biking and carpooling. These programs reduce the school peak hour congestion conditions and improve air quality around school areas as well as increasing school aged children's sense of responsibility, independence and general health.

The developing network of shared-use paths within the City of Sierra Vista are now reaching into unincorporated areas of the County connecting links and other recreational trails on adjacent public lands, such as the trails systems in the Ramsey canyon area. On such proposed connector is the Ramsey Rd to Carr Canyon Rd, a proposed one mile connection that would link to the Brown Canyon Loop route. Completing the St. David area sidewalk plan is a goal of the St. David area plan. And the County has taken a look at a connection between an existing 0.6 mile trail leading to the Murray Springs Clovis site and connecting it, along the San Pedro River, to the San Pedro House near SR-90 via an abandoned railroad line. Eventually, trails like these would connect to the developing Arizona Trail system under development by the Arizona Trails Association. Other historic routes, such as the Butterfield Overland Trail, currently being considered as a segment of the national historic trail system, have the potential of being tourist destinations.

At the current time the County lacks a coordinated pathway or trail system plan. Challenges include the need for adequate right-of-way, constructing and maintaining trailhead facilities,

managing public perceptions of safety vs. access and the lack of dedicated funding sources for these types of facilities. Typically associated with urban, not rural environments, there have been only a few specific pedestrian improvements that have been undertaken such as the short concrete sidewalk in Elfrida and the 0.41 mile pathway in St. David.

There is also no specific maintenance department for pedestrian facilities nor does the County have a Parks and Recreation Dept. that would typically oversee these types of facilities. As a result, there is no mechanism in place to develop and maintain trailheads and landscaping amenities. Other critical elements of roadways maintenance, such as tree trimming, weed removal, and roadway edge mowing are currently overseen by the Highway Dept. operations staff.

Developing a mechanism to maintain existing and future pedestrian facilities is a major need of this 2040 LRTP. However, the ecotourism, public health and safety benefits that can be realized, along with improvements in alternative mode options, make developing an integrated pedestrian system an important element in the County's transportation system.

As multi-use or shared use pathways are developed and connectivity increases, so does activity on those pathways. An additional 50 miles of sidewalks, pathways or trails are expected to be constructed by the year 2040. Providing accommodation for mobility impaired users is a required ADA element of design. Construction costs, depending on type of facility, range about $250,000 to $500,000 per mile of pathway.

Recommendations for the 2040 LRTP Pedestrian System

- Partner with the School Superintendent's office and School Districts to encourage and support the expansion of the Safe Routes to Schools program concepts county-wide.
- Conduct a minimum of one SRTS assessment per school year; develop a trained assessment team within Cochise County by the year 2020.
- Complete a minimum of 10 enhancement projects to the transportation system by the year 2040.
- Complete a pathway and trails plan with policy, recommendations, implementation dates and identification of potential funding source by the year 2020 and update at least once by the year 2040.
- Develop and construct an estimated 2 miles of sidewalk, pathway or trail each year.
- Identify opportunities to preserve or develop pedestrian connections to public lands, trails, parks or schools through the development review process.
- Identify and develop alternative mode linkages to support economic development, tourism and sense of place.
- Develop a recreational amenities maintenance program within the Highway Dept. Operations Division to ensure future maintenance of the bicycle and pedestrian facilities, including trailheads and transit stop mini-parks.
- Create and support a stakeholder group that brings together the advocacy groups for bicycling, pathway and trails to develop joint recommendations and prioritize future projects.

AVIATION SYSTEM CONDITIONS AND RECOMMENDATIONS

General aviation facilities, including heliports, are key transportation centers that have potential to spur the economy and allow for the transfer of goods and people, as well as emergency services, in remote rural areas. Cochise County also has quite a number of private airstrips serving either emergency service needs or ranching/agricultural needs. These private airstrip owners are responsible for maintaining adequate and safe access to their own airstrip as well as maintaining adequate and safe conditions on their runway landing site.

There are a total of eight general aviation airports in Cochise County, of which two are overseen by the County. Bisbee-Douglas International Airport, located eight miles northwest of Douglas, and Cochise County Airport, three miles west of Wilcox, are managed by Cochise County Facilities Department. In addition, there are several privately owned airstrips, heliports, and airparks located throughout the County. The largest private air facility is the Tribal Air Airport located one mile east of the McNeal area. Table 18 lists the general aviation airports in Cochise County and corresponding operations and services.

TABLE 18: COCHISE COUNTY AIRPORTS

FAA ID	Airport Name	Location	Fuel	Based Aircraft	Operations (avg/week)
P33	Cochise County Airport	3 miles west of Wilcox	Yes	23	23*
DUG	Bisbee-Douglas International Airport	8 miles northwest of Douglas	Yes	12	54
FHU	Sierra Vista Municipal Airport-Libby Army Airfield	3 miles north of Fort Huachuca Sierra Vista	Yes	55	365**
E95	Benson Municipal Airport	3 miles northwest of Benson	Yes	31	21
P04	Bisbee Municipal Airport	5 miles southeast of Bisbee	Yes	12	94*
DGL	Douglas Municipal Airport	2 miles east of Douglas	Yes	22	31*
P29	Tombstone Municipal Airport	3 miles southeast of Tombstone	No	4	28*
P03	Cochise College Airport	7 miles west of Douglas	Yes	15	129*

*for 12 month period ending Apr. 2011, ^For 12 month period ending Apr. 2012, **for 12 month period ending Dec. 2012

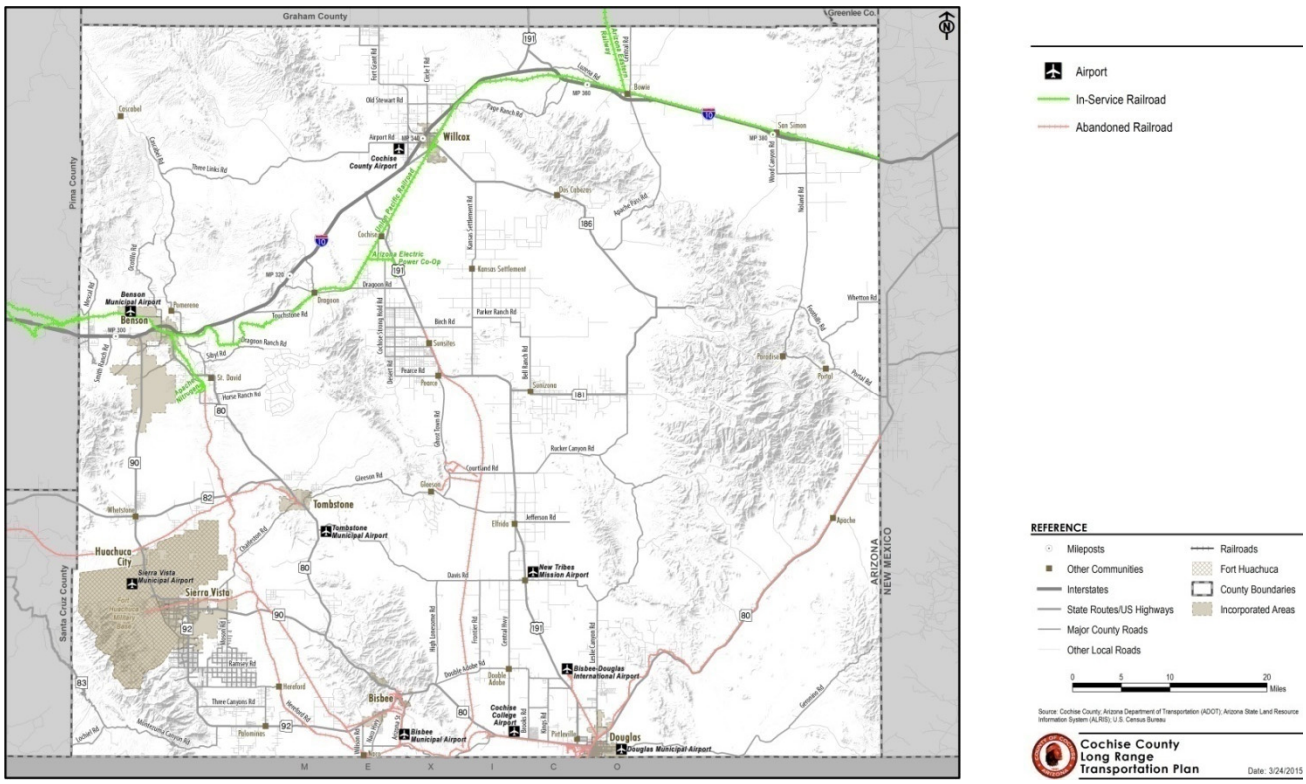
Source: Federal Aviation Administration, AirNav, LLC

Three plans are in place that provide detailed recommendations and cost estimates for future improvements for the County's airports.

- **Regional Aviation System Plan (RASP)**: Adopted by the PAG Regional Council in June 2002, this plan includes one of the airports located in Cochise County: Benson Airpark.
- **Airport Master Plan: Cochise County Airport:** Completed in 2014, this plan identified improvements for two runways, construction of a bypass taxiway and aircraft apron and improvements to hanger and terminal buildings. Total development costs were estimated at $12,830,000 with FAA share of $8,728,101; State share of $428,453 and the County's local share (which might include private development funds) of $3,673,446. Operating costs are estimated at $16,000 annually.
- **Airport Master Plan: Bisbee-Douglas International Airport: Completed** in 2014, this plan identified improvements to one runway, parallel and bypasses taxiways, additional

hangers and building renovations. Total development costs were estimated at $14,285,000 with FAA share of $12,124,639; State share of $595,181 and the County's local share (which might include private development funds) of $1,565,180. Operating costs are estimated at $498,700 annually.

MAP 19: AIRPORTS AND RAIL SYSTEM



Recommendations for actions and/or projects for each airport in the system to meet the future needs of the regional aviation system were prioritized and identified in three phases over a 20 year timeframe. Intermodal and access recommendations were also made. Pavement maintenance schedules are more rigorous for airport runways than on roadways: crack sealing should occur every one to two years; seal-coats and remarking pavement every 3 to 8 years, overlays anticipated every 15 to 18 years. Aviation projects identified in Airport Master Plans are eligible for Federal Aviation Administration grants. It should be noted that although FAA provides significant resources towards these County airport facilities, the County must provide adequate staffing to apply for FAA and State grants; provide oversight to the implementation of the Master Plans and grants as well as the operations and maintenance of the County owned airport facilities.

Recommendations for the 2040 LRTP Aviation System

- Coordinate with both the FAA and ADOT Aeronautics to implement the recommendations of the Master Aviation Plans for the Cochise County's airports.
- Prioritize improvements and transportation enhancements to general aviation airport access roadways.

- Provide development review of private airstrip requests and ensure notification of potential applications to Fort Huachuca and FAA of new airstrips.
- Preserve and protect adequate airspace around military and general aviation airports.
- Coordinate within County departments to leverage resources to provide infrastructure improvements to access aprons, parking and driveways.
- Apply for FAA funds to conduct a regional aviation plan to include all of Cochise County's general aviation airports (both public and private) by the year 2040.

RAILROAD SYSTEM CONDITIONS AND RECOMMENDATIONS

The State Rail Plan documents existing rail facilities and conditions and identifies future rail system needs. The railroad system in Cochise County, running on Union Pacific Railroad lines, consists of more than 442.21 miles of railroad tracks, of which 123.91 miles are currently in-service. Amtrak picks up passengers approximately three times per week at the centrally located Train Depot in Benson and intermodal freight connections are made at the Port of Tucson, located in the Foreign Trade Zone, southeast of Tucson. Abandoned railroads are inactive lines; however, the underlying right-of-way is typically retained by the railroad company. Nearly all of the active railroads are located in the northern portion of the County along I-10.

An area of concern for the efficient movement of freight, congestion relief and safety are the intersections with roadway and railroad lines. Several railroad and roadway intersections have reconstruction or existing bridge replacements planned and one new railroad bridge is potentially planned to be constructed as part of the future St. David extension route. Identification of County railroad crossings that may require separation, relocation or protective devices will assist in proactively planning for addressing these public crossings.

Types of roadway-rail grade crossings include prefabricated units made of treated timber, wood surfaces, asphalt surfaces with flange openings, precast concrete slabs that may be removable for maintenance activities, continuous concrete surfaces over the travel area, preformed rubber sections, preformed steel or metal sections, or gravel or other unconsolidated materials with or without planks along the running rail. All of these types of crossing surfaces require maintenance activities and, depending on the traffic volumes and proximity to urbanized areas, various warning signs and devices are needed. On roadway corridors with high bicycle ridership it is desired to add signage to alert bicyclists to the need for additional caution when traversing any type of roadway-rail grade crossing.

Recommendations for the 2040 LRTP Railway System

- Develop and maintain working relationships with Railroad companies operating within Cochise County.
- Coordinate with the State to conduct a safety and maintenance analysis of all railroad crossings and prioritize improvements to existing railroad crossing warning systems.
- Identify the best railroad crossing location for the future St. David extension route and obtain adequate rights-of-way easements in advance of the construction phase.

- Consider partnerships with ADOT for the use of Railway-Highways Crossing (Section 130) Program funds for the elimination of potential hazards at identified County railway-highway crossings. These funds may also be used for the installation of traffic signs and signals.
- Protect through temporary alternative uses (e.g. Rail to Trails Programs) appropriate railroad right-of-way for future high-speed or freight rail corridors.
- Provide appropriate warning signs for bicyclists at corridor railroad crossings.

TRANSPORTATION FUNDING AND COSTS

Existing Revenue

There are three major sources of funding for transportation: federal and state, and local. Federal funds are primarily derived from the gas tax, which is currently unchanged since the early 1990's at 18.4 cents per gallon. Federal formulas distribute these funds to the individual states and to qualified jurisdictions. The State also receives revenues dedicated to transportation uses from fuel taxes, large truck taxes and vehicle licenses. The State gas tax currently is set at 19 cents per gallon (unchanged since 1991). Funds typically referred to as HURF (Highway User Revenue Fund) are included in the State source revenues. In Arizona, these funds are distributed to Arizona Department of Transportation (ADOT), the Arizona Department of Public Safety, the cities, the counties and regional transportation organizations such as SEAGO and the SVMPO. Local sources of funds may include development impact fees, construction sales taxes or a general sales tax. Local jurisdictions also may contribute general funds for transportation, and/or request exactions from developers to offset the cost of transportation improvements that directly serve the proposed residential or commercial land use

The types of revenue streams available to fund transportation projects can be grouped into two major categories:

- **Funding source**-which is a pot of money available for transportation projects or activities;
- **Financing mechanism**-which is a tool that allows counties to build needed projects today by borrowing against tomorrow's funding streams.

Virtually all revenue sources available for transportation to the region have restrictions on how the funds may be used. Federal and state laws limit the use of transportation funds for various transportation modes. State Highway User Revenue Fund (HURF) monies, under state statutes, may only be used for highway purposes. Most of the federal highway monies also must be used for roadways, although a portion may be transferred to transit projects (flexible usage). There are some local revenues that are not restricted; however, local ordinances may specify or further restrict the use of these local revenues. Federal transit funds and state lottery distributions must be used on transit projects. Private contributions, such as developer impact fees, also have limitations on where and how those funds can be used. Another factor that provides constraints to the Highway and Floodplain Department's ability to plan for large capacity improvements is that state law limits the amount of funds that a County may spend in any given fiscal year. This inability to save up for high cost items, like bridge replacements, is why expenditure limit overrides or permanent base adjustments are requested so that the County can spend funds it has saved up for major cost items rather than use loans and incur future interest payments (which is a funding mechanism exempt from expenditure limits).

In FY 2014-2015, Cochise County had a total annual budget of about $160 million with 31 County departments providing County services. The Highway and Floodplain Department relies primarily on three funding sources: Highway User Revenue Funds (HURF); Vehicle License Tax (VLT) and a secondary tax rate on property dedicated to the Flood Control District. The first two generated an estimated $7,700,366 for the maintenance, repair and construction of roadways and the Flood Control District generated an estimated $2,222,655 for Floodplain work activities (FY2014-2015). In addition, in recent years the Board of Supervisors has supplemented the Highway Dept. budget with approximately $1 million from the General Fund (these funds would otherwise be used to meet other County service needs).

All three of these Highway and Floodplain Dept. fund sources have experienced decreases over the last three fiscal years. The causes of these decreases include the redirection of HURF revenues by the State to fund other State programs; declines in the sales of gallons of gas due to increased fuel efficiencies and alternative fuel vehicles; decreases in net primary assessed valuation; changes in travel patterns; slowing of development growth combined with population declines and an aging population base that no longer drives. These, among other national, state and local economic changes and policies, also have caused decreases in funding sources from regional and state governments.

Southeastern Council of Governments (SEAGO), working cooperatively with their member jurisdictions, are responsible for programming (selecting projects for funding) approximately $1,001,206 of Surface Transportation Program (STP) funds each year. The SVMPO is responsible for an estimated $307,205 annually of STP funds. Federal funds, administered by the COGs and MPOs, are also subject to annual adjustments in obligation authority by the Federal government; currently that obligation authority is .939 percent of the annual fund allocation.

Parts of unincorporated Cochise County is located within both of these regional agencies. Once a decision is made to program funds, responsibility for project implementation typically remains with the sponsor jurisdiction where the project is located. Both regional agencies also provide access to other funding such as the Highway Safety Improvement Program (HSIP), off-system Bridge Funds, section 130 Railroad Crossing Safety and Improvement funds and Transportation Alternative Programs. Cochise County has been awarded $7,386,248 million dollars in highways funds in the SEAGO five-year Transportation Improvement Program (TIP). It should be noted that federal funds, while providing much needed resources for high cost projects, require substantive in-kind administration, tracking and oversight as well as have federal requirements for documentation and reporting.

Available Funding Source Table is included in Working Paper 2: Appendix B.

Forecasted Revenues

Some revenue sources, such as gas tax, are more stable than other sources of revenue, like construction sales tax or lottery revenues. However, even the gas tax has become less reliable as vehicle types shift to alternative fuels. The variability of some of the revenue sources, along with the unpredictability of long-term economic forecasts and population growth make long-term financial forecasts difficult to prepare. However, these financial forecasts help to match revenues with transportation needs and potential projects in both the short and long term.

Existing revenue sources are projected to provide an estimated $491,030,056 million for the planning period of 2015 through 2040. Of that estimate, $46,145,683 is restricted to activities within the FEMA designated floodplain and is under the control of the Flood Control District.

The LRTP Revenue forecast includes the following assumptions:

- HURF fees are assumed to remain constant for the period of the forecast.
- ADOT's HURF forecast through fiscal year 2024 is incorporated into the long-range forecast. A compound growth rate of 3.4 percent is assumed through the year 2023 and a compound growth rate of 3.2 is assumed through 2040.
- Flood Control District forecast assumed the continuation of a secondary tax rate of .2597 with trends of declining net assessed valuation through the year 2026, gradually abating throughout that time, and then growing to a stable growth rate of 2% through 2040.
- Future annexations will not change the percent of Cochise County unincorporated population in relation to the State.
- The county population factor is assumed to remain at 1.9 percent of the State's population.
- Continued use of the same level of gasoline as a primarily fuel source throughout the planning period, and reliance at the federal and state level on gasoline fuel taxes for transportation improvement revenues.

Projected Cost Estimates

A number of recent efforts have been made to better identify costs as revenues began to be outpaced by the impacts of increased material, equipment and gasoline costs. In the last decade, the cost of gasoline (not gas tax) rose from $1.31 to $3.29; diesel fuel cost rose from $1.52 to $3.62; purchase costs of graders went from $165,000 to $289,000 and dump trucks increased from $83,900 to $165,000.

Also, in the last decade, the costs of upgrading dirt roads to chip-sealed surfaces subsequently increased by 56 percent. The only County costs that have decreased in that time were labor costs (due to senior equipment operators leaving employment and being replaced by temporary or lower paid staff). A preliminary planning level unit cost estimate, in 2014 dollars, for roadway maintenance and construction by roadway type is presented in Table 20.

TABLE 20: UNIT COST ESTIMATE FOR ROADWAY MAINTENANCE AND CONSTRUCTION

Roadway Type	ADT	Maintenance Costs	Construction Cost
Native Road (No base)	< 50	Grading 2 times per year, signing for Primitive Roads $2,000/mi./yr.	N/A
Context Sensitive (4" AB)	50 - 250	Grading 4 times per year and after heavy rain events. $8,000/mi./yr.	Clearing, earthwork, drainage, place AB. $253,500/mi.
Base Stabilizer (Polymer)	50-400	Spot repairs for drainage issues and pot holes. $1,500/mi.	Scarify, apply polymer, grading, apply water and roll. $20,275/mi.

Roadway Type	ADT	Maintenance Costs	Construction Cost
Rural Road (6" AB, prime, DCS)	250 - 400	Repair Potholes, Crack Sealing, Striping and Signing $2,500/mi.	Clearing, earthwork, drainage, place AB, prime base, apply Double Chip seal. $507,000/mi.
Chip Seal (Double Chip Seal)	250-1000+	Repair Potholes, Crack Sealing, Striping and Signing $2,500/mi.	Prepare surface, apply double chip seal 3/8 inch chips. $125,350/ mi.
Collector Road (6" AB, 3" AC)	400 – 1000+	Repair Potholes, Crack Sealing, Striping and Signing $2,500/mi.	Clearing, earthwork, drainage, place AB, AC paving, striping. $1,014,000/mi.

Just as the economy began its downturn and before costs spiraled upward, a 2008 assessment conducted by the Arizona Association of Civil Engineers (AACE) and shown in Table 21, identified a total ten year roadway funding need of $387,189,000 ($424,680,000 in 2014 dollars). If this estimate was extended out until the year 2040, cost estimates for roadway needs in the timeframe of 2015 to the year 2040 would be approximately $870,594,000.

TABLE 21: 2009-2018 NEEDED ROADWAY EXPENDITURES

2009-2018 Needed Roadway Expenditures Arizona Associations of County Engineers 2008 Report		
Operations & Maintenance		$235,247,000
Existing Bridge Repairs/Maintenance		$7,919,000
New Bridges on Existing Roads		$5,238,000
Upgrade Existing Roads		$199,102,00
New Road Construction		$1,308,000
Safety Improvements		$35,199,000
Total		**$387,189,000**

Source: Based on most current AACE Report for Cochise County: 2008 dollars. This AACE estimate does not consider planning activities, data collection and reporting, alternative mode facilities and other activities of the Highway and Floodplain Dept.

Shortly after this assessment was completed, an economic slowdown began to impact revenues, combined with transfers of mandated services costs from the state to the Counties, along with state shared revenue sweeps, resulted in declines in revenues (33 percent in the last seven years). Costs, however, rose significantly during this same time-period. As future regulatory mandates are developed costs for roadway maintenance and construction are likely to increase.

The total Cochise County multimodal transportation system needs, based on the 2040 LRTP proposed recommendations, through the year 2040, have been roughly estimated at $755,150,000 dollars, as shown in Table 22.

TABLE 22: 2040 LRTP UNCONSTRAINED ESTIMATED COSTS IN 2014 DOLLARS (in thousands)

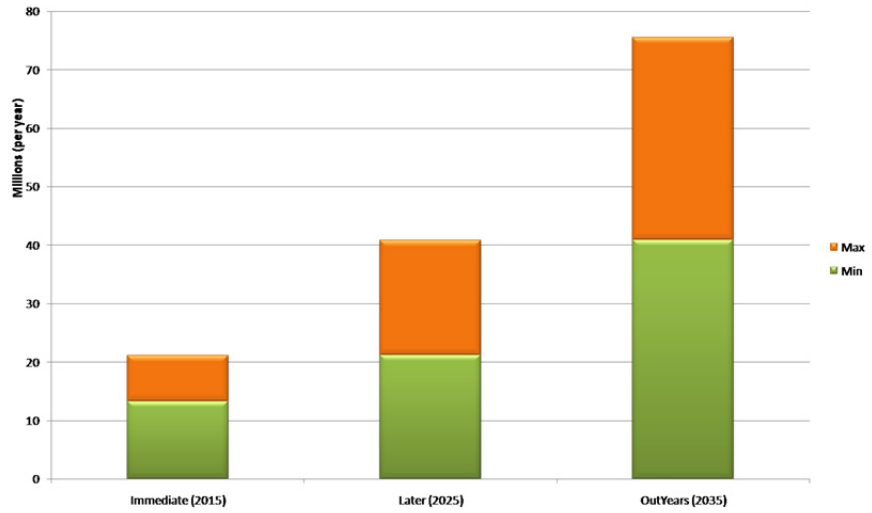
2040 LRTP Elements	Immediate (2015-2025)	Later (2025-2035)	2035 and Beyond
Studies	$125 to $250	$125 to $500	$500 to $750
Update to Roadway Design Standards	$150 to $175	$150 to $200	$200 to $250
Programs	$250 to $500	$250 to $800	$800 to $1,300
Right-of-Way Acquisition	$750 to $1,500	$1,500 to $8,400	$8,400 to $10,900
Roadway& Safety Improvements	$25,000 to $75,000	$75,000 to $225,000	$225,000 to $450,000
Dirt Roadway Improvement Program	$1,300 to $5,300	$7,200 to $10,600	$10,600 to $16,800
Bridges and Culverts	$2,000 to $2,500	$2,500 to $6,000	$6,000 to $10,500
Railroad & Railroad Crossings	$25 to $50	$50 to $75	$75 to $350
Transit System Improvements	$50 to $800	$800 to $4,500	$4,500 to $6,300
Bicycle System Improvements	$10 to $300	$300 to $2,500	$2,500 to $6,500
Pedestrian System Improvements	$250 to $600	$600 to $3,500	$3,500 to $4,000
Aviation System Improvements	$3,000 to $4,500	$4,500 to $6,000	$6,00 to $7,500
Maintenance Program & Activities	$100,000 to $120,000	$120,000 to $140,000	$140,000 to $240,000
TOTAL	$132,910 to $211,476	$211,476 to $40,075	$408,075 to $755,150
TOTAL PER YEAR	**$13,291 to $21,148**	**$21,148 to $40,808**	**$40,808 to $75,515**

Cost assumptions were made based on previous forecasted need projections, actual completion project costs within the SEAGO region, submitted grant applications, consultant and contractor average costs by mode, as well as the County's current annual work plan. These costs were broken down by phase, with the expectation, discussed in the next section of this plan, that additional revenue sources would be developed either at the local level and/or the federal, state or regional level. Ranges reflect the expectation that as additional resources become available the program elements would be increased to achieve the desired recommendations of this 2040 LRTP. Capacity projects, such as bridge replacements, are potentially a high cost item in any given year of this plan.

Potential New Revenue Sources

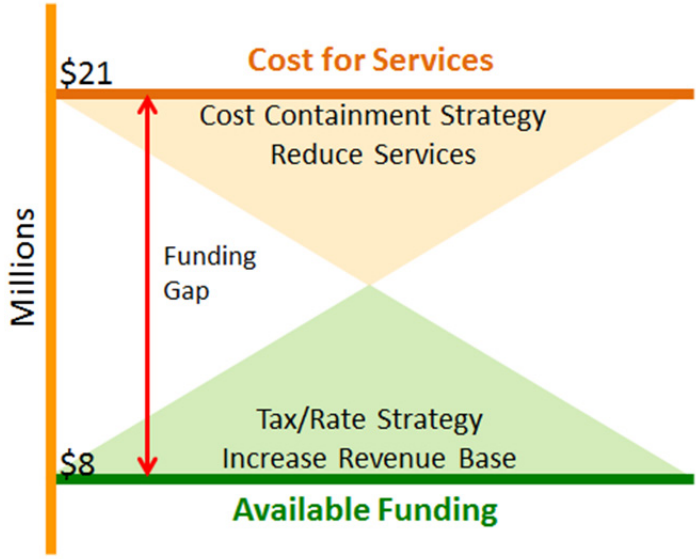
Total estimated cost estimates, in the 2040 out-year of this transportation plan, shows a potential need of an estimated $755,150,000 dollars. These projected needs exceed forecasted available revenues, $491,030,100. An additional 35 percent, or about $264,119,900, is still needed during the planning period of 2015 to 2040. Existing revenues of just over $9.9 million dollars do not even meet the very minimal maintenance and basic service needs, estimated for the current year at $13.3 million.

CHART 23: AVAILABLE FUNDING AND FUNDING NEEDS



As revenues began to exceed costs Cochise County undertook a number of measures to bridge the gap. Operator positions have been eliminated; positions have been held vacant rather than filled (Highway and Floodplain Department currently has a 35 percent vacancy rate); equipment replacement cycles have been lengthened; maintained road lanes miles have been reduced; capacity projects deferred. These stop-gap measures will result, eventually, in much higher costs to repair and reconstruct roadways as they deteriorate and equipment fails. With sharp increases in costs, available revenues are no longer adequate to meet even basic maintenance needs of the County's roadways system. Within this planning horizon it is anticipated that many of the County's paved roadways will revert back to dirt surfaces and existing dirt roads revert back to primitive road status with minimal blading schedules.

CHART 24: FUNDING GAP STRATEGIES



A number of suggestions for potential new revenue sources are briefly discussed in this section. Some reach to new growth, requesting participation from development to help pay for the infrastructure that they will be dependent on using. Some reach to the discretionary spenders while others look to the county residents collectively for assistance to help pay for the improvements and level of maintenance they desire. Ultimately, the more varied the funding sources are the more robust and flexible the revenues available for transportation purposes will be.

The County is neither populated enough or financially secure enough to fully fund all the desired improvements. **Local dollars do provide the most local control and the highest degree of flexibility of any funding source.** Even small incremental increases in revenues can also result in the ability to match local dollars with state and federal funds. Given the very large amount of federal lands within the County's boundaries, the County typically is required to provide a 5.7 percent match; thus potentially leveraging a small investment into major capital improvements. However, it should be noted that in-kind County staff support and other financial investments needed to complete a federally funded project could increase that match commitment to closer to 20 to 30 percent - potentially still a good return on investment for very costly projects with regional or state significance. Another strategy is to provide the local 5.7 percent match funds to the ADOT Safford District for improvements on the state highway system leveraging ADOT's staff resources and access to federal funds for needed improvements within the County.

Private Funding: New projects have been identified that will only be implemented if private funds are available. These projects are associated with new developments and are needed should those developments come to fruition within the horizon year of this plan. Historically, off-site improvements have been identified by submitted Traffic Impact Analysis reports and constructed by the applicants. Other sources of private funding include non-profit grants: private organizations that offer innovative ways to provide transportation infrastructure. The County had been successful at obtaining such grants from organizations like the Heritage Foundation and the Walton Foundation. Public-Private Partnerships (P3) is another potential tool to leverage private funding for public infrastructure.

Construction/Contracting Sales Tax: When new housing stagnates there typically is more activity in the remodel and home repairs. The rationale is that there is a direct correlation between housing size/value and vehicle trips generated onto the roadway network. These funds can serve as excellent match sources for both roadway and drainage projects.

Cochise County Development Impact Fees: New housing is expected to increase by about 37,000 homes, with about 9,000 of those within unincorporated Cochise County. For example, imposing a development impact fee, county-wide, of $1,500 per home could generate an estimated $13.5 million (200 home/$300,000/annually) over the 2040 LRTP planning period for roadway improvements. A consistent, smaller impact fee county-wide with defined transportation and drainage districts is recommended over larger fees within defined "growth" areas. In a large rural area impacted by lot splitting, defining growth areas for additional fees tends to accelerate leap-frog development and fails to address the individual rural area lot split impacts placing an unsustainable cost burden on the County.

Average development impact fees (researched in 2008) in the State of Arizona averaged $7,000 per parcel/residential unit for off-site improvements. State statutes govern how these types of impact fees may be used. Given the extensive roadway and drainage improvements needed throughout the County, applying development impact fees to the travel-shed of any new development assures improved and safer access to these areas in the County experiencing growth. Impact fees increase certainty for commercial and subdivision developers as to off-site contributions and can be assessed as development actually occurs rather than required as up-front investments. These impact fees can also be used to leverage needed improvements on the state and regional transportation systems serving growth areas.

Cochise County Sales Tax: Total sales taxes in Cochise County are 6.10 percent, consisting of 5.60 percent Arizona state sales tax and 0.50 percent Cochise County local sales taxes. Local sales taxes may reach up to 5 percent under current Arizona law. The existing half cent sales tax has generated an average of $6.84 million over the last five years. An increase of a quarter of a cent sales tax, dedicated to the transportation system needs, could generate an estimated 119 million dollars ($3.4 million annually) over the planning period for the maintenance, repair and replacement of the transportation system.

- Sales Tax is collected by the merchant on all qualifying sales made within Cochise County.
- Groceries are exempt from the Cochise County and Arizona state sales taxes.
- Six Counties have the same tax rate as Cochise County and eight Counties have higher rates. Only one, Mohave County, has a lower sales tax rate at .25%.
- All jurisdictions in Cochise County have additional sales tax rates that range from 3.5% (Tombstone) to 1.5% (Huachuca City).
- Sales taxes provide a revenue source that allows visitors and seasonal residents to contribute towards the County's transportation system providing their travel needs to visit recreational sites, international destinations or other locations.

Cochise County Bed Tax Increase: Cochise County has the lowest bed tax in the State, yet the number of tourists traveling on the roadway network is double that of area residents. These visitors tend to be spending discretionary funds and frequently desire to travel on our rural, native-surfaced roadways. These funds could be directed to improvements serving the access roads and pedestrian amenities, such as trailheads, which attract and serve the many visitors to the County. However, most lodgings are located within incorporated jurisdictions making this a very small source of potential revenue and are frequently perceived as a determent to inviting visitors to the area.

Property Tax Increase: Many members of the public believe, incorrectly, that property taxes are spent on roadway improvements. At the present time, property tax rates are $2.6276 per $100 in assessed value and have not been raised by the County in over five years. Assessed value typically lags behind actual appraised values. So even as land and housing sales may show small increases in prices per acre, the effect on the County's property tax collection is delayed

by several years. Typically, property taxes are used to meet other mandated County services and diversion of any of these funds to Highway needs, regardless of how critical they may be, leaves a funding gap in another County department. However, an option is available to raise property taxes and dedicate some or all of that increase to roadway and drainage improvements: a .05 cent increase per $100 dollars in assessed value could increase revenues by $500,000 per year.

Special Districts: Arizona Statute authorizes the creation of special taxing districts. Generally, special districts are authorized to levy taxes or assessments on the general public, usually in the form of taxes or assessments on property, and may borrow money to finance their operation, secured by their general taxing power, and are governed by elected boards of directors. Special districts are exempt from the Arizona debt limitations on counties and municipalities. Roadway and Maintenance Districts is one financial tool that County residents can use to finance desired improvements or enhanced maintenance activities in their area.

Aviation Funding Opportunities: The County's general aviation airports have unique funding options that include land and hanger leases, tie-down fees, airport usage fees and commercial activity fees for both aviation related and other non-aeronautical but commercial activities occurring on the airport property.

Federal, State and Regional Grants: Local funds can be leveraged or partnerships formed with federal, state and regional agencies to obtain funding for transportation studies, plans or projects. Often competitive, these grants require the submittal of applications and staff support to implement once received. Although staff typically looks to transportation agencies for these funds there are other sources that allow for transportation improvements to be included in broader grant applications (e.g. CDBG/Housing or CDC/Health or Az. Game & Fish Landowner Relations Program). Tracking opportunities, being able to take advantage quickly of available funding, and having adequate staffing to successfully implement awarded funds are key to supplementing the County's transportation budget for desired projects.

Recommendations for 2040 LRTP Transportation Funding

- The County is encouraged to form a Citizen's Technical Advisory Committee to study and make recommendations to the Board of Supervisors regarding the shortfall in available revenues to meet basic maintenance and future capacity transportation needs.
- Additional local revenues will be needed within the horizon year of this plan in order to meet basic maintenance needs of the existing transportation system. A commitment to a public outreach and education effort will be needed within the next ten years to discuss this issue with County residents.
- Although federal, state and regional funds are tied to expensive and time consuming requirements, at this time these are the only fund sources large enough for capacity improvements. Provision of staff dedicated to grant writing and federal project management may be necessary in the short-term in order to obtain project funding for the later phases of the 2040 LRTP.
- Partnerships with other agencies, jurisdictions, private developers and citizens will be necessary in order to be cost effective with limited resources. Developing these relationships at all levels of

County government will be necessary for leveraging available revenues and being prepared for new funding opportunities.

- Elected official advocacy directly at the state level to address on-going state raids on state-shared highway revenues should continue to be undertaken along with educating County residents, and soliciting their assistance, to advocate with federal and state officials for adequate funding for the construction, improvement and maintenance of the County's transportation infrastructure.

COCHISE COUNTY BOARD DIRECTION

Two Board of Supervisor's Work Sessions were held to discuss the findings and recommendations of the 2040 LRTP: March 24, 2015 and May 12, 2015. Individual meetings were also held with each Supervisor on April 14, 2015. Direction was given to staff to finalize the 2040 LRTP, to indicate the highest priorities for the Board and to incorporate into Highway and Floodplain Dept. activities the following guidance:

- Many recommendations are integrated with other important activities of the County. Other departments, such as those working with education, health, planning or economic development should be involved in implementing the 2040 LRTP recommendations.
- The existing Roadway Design Standards should be amended to include additional low volume, context sensitive and rural roadway standards within the next two years. This effort is tentatively identified for the 2016-2018 timeframe.
- Staff should bring forward to the Board a rural dirt road standard, as an interim measure, while seeking a grant to update the Roadway Design Standards.
- Re-assessing roadways in the existing maintained roadway system, based on technical data and current traffic counts is desired; however, there is strong concern about losing previous County financial investments in existing hard-surfaced roadways.
- Supporting the economic drivers of the County, including agricultural and ranching activities, should be a priority for infrastructure investment.
- Perfecting the Right-of-Way on County maintained roadways should also be a priority; given funding constraints, efforts to obtain voluntarily contributions and donations should be pursued within the legal framework of the Uniform Act.
- Given funding constraints, the County should not consider providing direct transit services in the near-term of this plan; however, as resources allow, support of existing transit systems is desired.
- Given funding constraints, the County regretfully does not see the possibility of a proactive development of bicycle and pedestrian facilities, amenities or enhancements in the near-term of the plan. However, the Board supported the concept of US Bicycle Route 90 through Cochise County, with a Letter of Support, under the Board chairman's signature, transmitted to the State.
- Given that there is no mandate to adopt a Long-Range Transportation Plan, and that a full County-wide public outreach has not yet been done, staff should incorporate the 2040 LRTP recommendations into the Highway and Floodplain Dept. internal guiding documents.

Stakeholder Input

Throughout the development of this 2040 LRTP, specific outreach to stakeholders for targeted information about current needs and future conditions was conducted. Initially, surveys were sent to County school districts, transportation service providers, emergency services and jurisdiction representatives. From January through March 2015, an on-line survey was released for general public comment and several meetings scheduled where residents of the County had an opportunity to share their thoughts about current and future transportation needs. Interestingly, many respondents indicated a lack of adequate resources for the transportation system as an issue of concern.

Future economic drivers were identified, including vineyards, solar power, tourism, agriculture and international trade. Most respondents noted existing condition concerns with the majority citing to drainage issues causing travel difficulties or hazards. Stakeholders noted the future need for wider roads, four lane extensions or turning lanes, shoulders and turn-outs, more bus service and several respondents noted a need for additional or better signs to direct visitors to County locations of interest.

A Summary of Stakeholder Comments is included in Working Paper 2: Appendix C.

The County should continue an educational outreach effort with the public about providing and maintaining transportation services with the severe funding constraints that are noted in this 2040 LRTP. Managing public expectations of what can be done, along with information about how residents can help to reduce costs and travel safely on the transportation system, will be important to successfully implementing the recommendations of this plan.

RECOMMENDATIONS

The 2040 LRTP recommendations were grouped into three phases: the immediate next ten years; a later phase through the year 2035; and, a future 2035 and Beyond category. The first ten years is assuming reliance on existing (and declining) revenues along with leveraging partnerships with state and federal agencies. The later phase is assuming that additional local revenues have been developed and implemented and those funds are becoming available for improvements. The 2035 and Beyond category is assuming that federal, state and regional agencies have addressed the growing disconnect between transportation needs and funding and additional revenues have become available for new roadway connections and enhancements to the future transportation system.

PRIORITIZED RECOMMENDATIONS: Recommendations were developed for all transportation modes as well as for supporting activities of the County's transportation department. Input from all three County Supervisors, the Highway and Floodplain Dept., and Stakeholder Outreach was used to identify highest priorities for near-term activities and phasing of recommendations.

Over the next 25 years of this 2040 LRTP, eight major categories of activities are recommended. The very first of those activities is a strategic adjustment to the County's maintenance system in

order to effectively provide the best possible roadway system within available funding. Key recommendations for each stage include:

1. **Strategically and systematically re-assess the roadway system:** Develop and adopt an updated rural Roadway Design Standards; then, based on prioritized criteria, re-assess roadway classifications and systematically convert existing chip-seal roadways to improved rural dirt roadway standards.
2. **Maintain what we have:** Seek to keep our current high-volume and higher-classification roadways from falling into a failing condition using proactive maintenance techniques to defer higher reconstruction costs into later years.
3. **Perfect what we have:** Seek to gradually increase resources towards perfecting the County's transportation system right-of-way. As resources increase throughout the 2040 planning period, seek to obtain advance right-of-way for future corridors.
4. **Improve what we have:** In the near-term, seek to leverage state funded projects, grant opportunities and private sector partnerships to improve the existing roadway network, while seeking to increase revenues for the later term improvements identified in this plan.
5. **Connect missing links:** Once local revenues are identified and approved by voters, connecting missing links can be prioritized and constructed either as partnered projects with federal, state or regional funds or independently as County funded projects.
6. **Increase Alternative Mode Options:** By the year 2035, it is anticipated that new revenue sources through federal, state or regional sources will be identified and approved by either congressional, legislative or voter initiatives. These revenue sources can then be applied to enhancing alternative mode options through improved roadway cross-sections and implementation of the recommendations of completed Bicycle, Pedestrian and other planning efforts conducted in early time-frames of this plan.
7. **Enhance freight and economic generator routes:** Critically important economic generator routes, including those that serve general aviation airports and the international Ports of Entry, should be targeted for enhanced transportation corridors.
8. **Integrate telecommunications/emergency technologies/technological innovations:** By the horizon year of this 2040 LRTP, it is anticipated that there will be new technological innovations that will improve travel options and communication within the County. Staff and funding resources should be directed toward integrating these innovations into the future transportation system. Intelligent transportation systems and driverless transport options are likely to be elements of the post-2040 transportation system, even in rural areas of the County.

Many excellent ideas were determined to be outside the 2040 timeframe of this planning effort. Others were determined to be beyond available or potential funding sources. This does not negate the value of those projects or preclude consideration of those projects for a future update of this County's long-range transportation plan. The projects within the recommended 2040 LRTP project list were deemed to be appropriate within the timeframe of this planning effort, have the highest priority for the regional transportation system and have the possibility of available or future funding.

2040 LRTP IMPLEMENTATION: NEXT STEPS

Given the challenges of the declining revenues, increasing costs, and limited potential for new funding sources to be implemented quickly, the 2040 LRTP finds that in the short-term priorities will have to be placed on maintenance activities of the existing system to the exclusion of virtually all other transportation recommendations. New or improved roadways will have to be reliant on outside funding and desired enhancements to the transportation system either in terms of data collection, amenities or improvements, will have to look to grant or private funding sources.

The recommendations identified in this 2040 LRTP will be integrated into the Highway and Floodplain's annual work plans. High priority tasks will be undertaken, studies conducted and projects staged to take advantage of available funding. Like any plan, this 2040 LRTP, provides a specific point in time perspective. Typically, long-range plans are updated every five to ten years. Long-range plan updates typically reflect work accomplished, identify new needs that have arisen, and update funding resources and cost estimates.

The future for Cochise County holds both challenges and exciting possibilities. Regional population will continue to grow and change rapidly in both character and culture. Hispanics are likely to become the new young majority with an aging white baby-boomer population living well into their 90s. The erosion of the middle class and the effect of a cyclic economy, combined with the growing influence of the global market, will likely result in changes to regional transportation needs. Strategic replacement and retrofitting of aging suburban housing tracts to create places that are more walkable, that allow aging in place and increase choices for density and housing types to meet the needs of the 21st century households, will also change the patterns of the County's existing rural transportation system.

Today's vehicle types will become obsolete. It is projected that by the end of the planning horizon, emerging technologies will include satellite-controlled vehicles, smart roadway surfaces and globally integrated transportation systems. Technological changes are moving at an exponentially fast pace with the new generation of virtually connected young adults seeking to "get their hands off the wheels and onto the keypad -- where they belong." A future challenge will be to integrate new types of vehicles, not only automated vehicles but alternative fuel vehicles requiring different sources of recharging. Adjusting to travelers using virtual space to connect in real-time to rides (such as now occurring with unregulated services like Uber, Lyft) and other elements of a "sharing economy" will likely change patterns and modes of travel. Drone technology already can carry significant weights. How goods are moved is likely to make a huge technological shift from freight haulers to individual point-to-point service. The re-emergence of 21st century, high-speed rail lines as well as high-speed human powered monorail type systems will also challenge the ability of governments to provide a transportation network that effectively addresses half a century of different types of travel modes.

Cochise County has a good start on a transportation system that can be increasingly effective over the next 30 to 50 years - with good planning, coordination and implementation. This 2040 Long-Range Transportation Plan sets a course to follow to accomplish the County's desire for a "safe, cost-effective and energy efficient" transportation system that will allow people to connect to the places that matter most to them into the next century and beyond.

APPENDIX A

2040 LRTP Recommendations

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
STUDIES					
Additional recommendations for studies are identified by mode in this 2040 LRTP.	✓	✓	✓		
Update the *Cochise County Roads Needs Study* and present findings to the Board of Supervisors on a regular basis.	✓	✓	✓		
Alternative Roadway Stabilization Demonstration Study: A number of innovative, "green" methods for improving dirt roads have been developed; however, the County has not had the opportunity to fully investigate the possibilities of using any of these methods or training in-house crews to construct or maintain these different types of surfaces.	x				*
Moson Road Corridor Extension Scoping Study and DCR: Working with the SV MPO, the first phase of this study effort would develop a project Scope of Work, update right-of-way acquisition costs, refine potential project construction costs, and identify potential funding sources. The second phase would fully develop a construction design and construction schedule.	x				
Colonia Area Circulation Plans and Strategies: The County has a number of small, densely urbanized areas that were initially laid out in the late 1800's and early 1900's before vehicle travel became the major transportation mode. Most have unofficial travel corridors, inadequate roadway widths, high pedestrian movement, and are often the source of multiple complaints regarding driver behavior or roadway conditions. Development in these areas often requires multiple variances from Roadway design standards. A study looking at these areas (e.g. Naco, Winchester Heights, Bay Acres, Bowie) to develop specific strategies to address these areas would improve local travel options and circulation in these historic residential areas.		x			
Rural Trip Generation Factor Study : Working with other rural jurisdictions and the Institute of Traffic Engineers, develop a rural factor for adjusting standardized trip generation factors used for traffic analysis. Developing this factor would improve the quality of traffic review conducted by both the County and developers, increase the accuracy of traffic modeling and reduce the potential for over-building or under-building transportation facilities.			x		
PROGRAMS					
Develop, as needed, new programs to improve or enhance on-going maintenance or data collection activities.	✓	✓	✓		
Reconsider the Fencing Program for the potential addition of cattle-guards as an eligible activity by the year 2020.	x				*
Update the Traffic Counting Program by the year 2016; obtain and implement an updated count and reporting process by the year 2017.	x				
Update the Neighborhood Traffic Management Program by the year 2020 to include more current traffic calming strategies, clarify neighborhood contribution costs, and address procedural barriers to the implementation of this program.	x				
Update the Drop/Add program with an adjustment in the average ADT requirements.	x				
Reconsider the Public-Private Partnership Program: place a moratorium on new projects until existing projects are completed.	x				
Standardize the Road Condition Survey; incorporate into the GIS system with a summary reporting tool for use in prioritizing the five-year work plan.		x			*
Provide a minimum of 1 FTE dedicated staff person to monitor and implement data gathering programs.		x			
RIGHT-OF-WAY ACTIVITIES					
Identify and pursue opportunities to acquire rights-of-way for future roadway alignments; averaging a minimum advance alignment purchase of 2 miles per year.	✓	✓	✓		*
Identify and pursue opportunities to abandon unused or very low volume roadway segments.	✓	✓	✓		*
Proactively pursue developer contribution of right-of-way with discretionary permit applications.	✓	✓	✓		*
Encourage donations of rights-of-way to the County on existing declared roadways.	✓	✓	✓		*
Update the Right-of-Way Needs Analysis a minimum of every ten years.	✓	✓	✓		
Acquire a minimum of 30 miles of rights-of-way for existing roadway network per year.	✓	✓	✓		
Complete entry right-of-way information into the County's GIS system.	x				*
Complete applications for potential State Lands R2477 claims by the year 2020.	x				*
Update the 1999 *Right-of-Way Needs Analysis* to reflect acquisitions obtained since that time; reassess needed ROW widths and update cost estimates by the year 2016.	x				
Provide a minimum of 3 FTE dedicated staff positions for rights-of-way activities.		x			
Provide a minimum advance rights-of-way acquisition budget for future corridors.			x		
Fully perfect the right-of-way on the County's maintained roadway system by the year 2040.			x		

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
ENVIRONMENTAL ACTIVITES					
Use available environmental and archeological databases and tools in the project scoping phase.	✓	✓	✓		
Use standard formulas to calculate culvert and crossing structure size and openness ratios that accommodate target species; follow wildlife-friendly fence guidelines; use local scale wildlife corridor mapping that incorporates wildlife movement data and habitat conditions; and implement other standard mitigation recommendations that allow planners and engineers to effectively and easily consider wildlife during the scoping phase of projects.	✓	✓	✓		
Develop a current NEPA Process Chart to assist with tracking environmental requirements and progress towards Environmental Clearance when implementing construction projects.	x				
Encourage and support biological assessments within the County to increase the known base of information and proactively assess potential concerns and needed mitigation.	x				
Support the addition of dedicated SEAGO and/or SV MPO staff to assist with obtaining and tracking environmental clearance documents.		x			
Identify key wildlife corridors and plan for wildlife crossings, where appropriate.		x			
Establishment of future County pathways or recreational facilities, such as parks, should adequately identify and preserve roadway corridors to avoid 404 NEPA impacts.		x			
Encourage and support interdisciplinary research and collaboration to resolve conflicting concerns across multiple archeological, biological and environmental fields.		x			
Advance archeological studies along known existing and future corridors desired for improvement to jump-start projects when the time is right for construction.		x			
Consider the recommendations of the *Community Wildfire Protection Plan* , where appropriate, for planning evacuation routes and using roadway design as planned firebreaks in areas at risk of wildfires.		x			
LEGISLATIVE POLICY CONSIDERATIONS					
Maintain memberships in lobbying arms of appropriate agencies. The rationale for this legislative action is to support an active presence at both the national and state levels on transportation related issues.	✓	✓	✓		*
Analyze re-authorizations transportation bill(s) and identify potential new opportunities for funding. The rationale for this legislative action is to support awareness of not only opportunities but also new requirements.	✓	✓	✓		*
End the diversion of dedicated transportation funding and encourage ADOT to restore the HURF exchange program. The rationale for this legislative action is that inadequate state-generated transportation revenues, due to diversion of millions of dollars of HURF revenues in the State General Fund, has reduced the flexibility of ADOT to assist local governments in producing smaller rural projects in a cost effective manner.	x				*
Support exploration of alternate dedicated transportation funding sources. The rationale for this legislative action is that other innovative revenue streams, not tied to the traditional fuel funding sources, need to be explored. This could include vehicle miles traveled or use taxes that would capture revenue from all vehicles including alternative fuel vehicles.	x				*
Increase the Title 34 Force Account work limitation to $500K (including or excluding the cost of material)and index to keep pace with inflation. The rationale for this legislative change is to increase the flexibility to use County forces for small projects; current limit ($217K) is insufficient to upgrade a single mile of roadway thus forcing increased costs for contractors to work in outlying rural areas. Many contractors are not interested in bidding small projects in rural areas, and when they do, bids frequently come higher than budgeted because of mobilization costs.	x				*
Support expansion of existing dedicated transportation funding sources. The rationale for this legislative action is that Arizona has not adjusted the gas tax for over 24 years and similarly the federal gas tax has not been adjusted since 1993. Dedicated revenues for transportation are decreasing while costs for transportation are increasing. Sustainable funding mechanisms for critical infrastructure are needed and additional options made available for local governments to self-finance transportation projects.		x			*
Reduce the default speed on primitive dirt roads to 45 mph. The rationale for this legislative change is to encourage reduced speeds on historic, old roads that have limited maintenance and were constructed without engineering standards thus improving safety for the traveling public. The County Board of Supervisors rejected this change in 2010 as a premature and unnecessary action that would be virtually impossible to enforce. However, within the horizon year of this plan and the stated strategic goal to emphasize safety for County residents, this issue is suggested for reconsideration by the year 2040. This measure was supported by the Arizona Association of County Engineers based on the AASHTO 2001 guidelines for very low volume local roads.			x		*
Cap the liability limit for the State DOT. The rationale for this legislative change is to bring ADOT into line with the majority of other states that have reduced their risk and are able to be more flexible with design standards, where appropriate.			x		

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
REGIONAL AIR QUALITY CONSIDERATIONS					
Ensure that dust control plans are prepared and implemented for construction projects (roadway as well as residential and commercial developments).	✓	✓	✓		
Prioritize improving to a hard surface any native-surfaced roadways within three miles of the PM10 nonattainment site.	X				
Participate with ADEQ on the EPA Border Program: U.S.- Mexico Border Air Monitoring Working Group.	X				
Prepare and update regularly a Natural Event Air Quality Action Plan.		X			
SAFETY CONSIDERATIONS					
Continue to monitor crash data and assess high crash site characteristics.	✓	✓	✓		*
Provide advance public information reports through multiple media outlets alerting the public to adverse weather conditions.	✓	✓	✓		*
Partner with ADOT to address improvements to intersections with the state highway system.	✓	✓	✓		*
Proactively address potential sight distance issues during the development review process.	✓	✓	✓		
Use crash-related data to develop targeted public information outreach.	✓	✓	✓		
Coordinate with the health department, medical facilities and schools to strengthen driver education and proper safety-restraint-use outreach	✓	✓	✓		
Coordinate with SEAGO and all other Cochise County local jurisdictions on the development of a regional safety plan by the year 2020.	X				
Use engineering design and traffic calming techniques to reduce speeding in residential areas; especially in areas around schools.		X			
Reduce the frequency and severity of lane and roadway departure crashes through roadway infrastructure improvements e.g. edge striping with reflective pavement markers.		X			
Identify potential conflicts with bicyclist and pedestrians, in particular, at intersections, railroad crossings and high-volume roadway segments.		X			
Identify potential conflicts with wildlife or livestock and implement improvements to decrease unexpected encounters on the roadway.		X			
Reduce default speeds on dirt roads to a minimum of 45 mph.			X		*
Identify and systematically re-configure flying "Y" intersections throughout the County.			X		
ENVIRONMENTAL JUSTICE CONSIDERATIONS					
Complete the County's Title VI Public Participation Plan and update every ten years.	✓	✓	✓		
Prepare county-wide public outreach, in coordination with the Bureau of the Census, to improve demographic and socio-economic data during each decade Census.	✓	✓	✓		
Develop targeted outreach techniques for protected population groups.	✓	✓	✓		
Consider the need for services for residents that own no vehicle or are unable to drive.	✓	✓	✓		
Monitor regulatory changes mandating accommodations within the American with Disabilities (ADA) act and implement, when feasible, enhanced signing and striping in areas with larger numbers of elderly drivers.	✓	✓	✓		
Provide, when feasible and appropriate, specialty signing or lighting in areas with deaf or blind students.	✓	✓	✓		
TRANSPORTATION AND ECONOMIC CORRIDORS					
Participate in local Ports of Entry or International Border planning projects; support recommendations of the *Arizona-Sonora Border Master Plan* .	X				*
Declare future corridors for the future out-year roadway widths and prioritize for advance right-of-way acquisition.	X				
Seek opportunities to conduct scoping studies, corridor studies or design concept reports for these future corridors.		X			
Develop parking and pedestrian facilities adjacent to the Ports of Entry to support cross-border pedestrian travelers.		X			

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
ACCESS MANAGEMENT					
Enforce existing design standards for new access locations and design during the development review process.	✓	✓	✓		
Obtain, in appropriate locations, no access easements to control future development access points; prioritize access control and no access easements on existing and future corridors.	✓	✓	✓		
Support the Access Management requirements and specifications on the state highway system to ensure the continued functionality of the County's high speed, major arterial transportation roadway network.	✓	✓	✓		
Update the driveway access requirements and specifications in the County's *Road Design & Construction Standards & Specification for Public Improvements* , by the year 2018.	X				
Where applicable, purchase grandfathered access rights and decommission non-compliant access points.			X		
Develop a County-wide Access Management Plan by the year 2040.			X		
ROADWAY SYSTEM - DESIGN STANDARDS					
Update the County's *Roads Design & Construction Standards & Specification For Public Improvements* to be completed and adopted by the year 2020.	X				*
Develop a design standard for rural, low volume, context sensitive roadways to guide both private and public construction and maintenance of local roads.	X				*
Develop a design standard for an improved local road that is maintained at a higher level than a native-surfaced primitive road but is not fully improved to a chip-sealed surface.	X				*
Investigate the use of soil cements, binders or polymers in lieu of extensive Aggregate Base placement for use on appropriate roadways.		X			*
ROADWAY SYSTEM - ROADWAY IMPROVEMENTS					
Coordinate intersection improvements with ADOT, with state funded improvements on the state highway.	✓	✓	✓		
Support ADOT access management and driveway standards to maintain the state system as a high volume, limited access, major travel corridors.	✓	✓	✓		
Participate, develop and review scoping studies for out-year potential corridors.	✓	✓	✓		
Completion of Chino Rd/3rd St from SR-80 to US-191(Douglas area)	X				*
Analyze and prioritize hard-surfaced roads by traffic volumes, perfected ROW, types of uses, safety and air quality concerns for milling back any remaining chip-seal and converting to an improved native surfaced roadway.	X				
Extension of Buffalo Soldier from SR-92 to South Moson Rd (Sierra Vista area)		X			*
Improvements and upgrades to County roadways (as shown on WP 2 - Map 3.7)		X			
Relocating and reconstructing Davis Rd; US-191 to Central Hwy (Elfrida area).		X			
Capacity improvements to County roadways (as shown on WP 2 - Map 3.8)			X		
Expansion of Ocotillo Rd from the Benson city limits to Aviation Dr to four lanes (Northwest area)			X		
Extension of Oak Ave, including associated bridge, from the Hospital at Kings Rd to Sulphur Springs St (Douglas area)			X		
Extension of South Moson Rd from Hereford Rd to SR-92 (Sierra Vista area)			X		
ROADWAY SYSTEM - NATIVE-SURFACED ROADWAYS					
Increase staffing, equipment and resources for materials to meet or exceed minimum blading and reshaping schedules.	✓	✓	✓		
Prioritize dirt road improvement list by traffic volumes (>250 ADT), perfected right-of-way, types of uses, safety and air quality concerns.	X				
Analyze County dirt roads for surface materials and drainage needs; prioritize based on traffic volumes, safety, air quality concerns and types of soils to select roads for adding materials and reshaping in order to enhance drivability during adverse	X				
Identify roadways for potential full or partial abandonment that are carrying less than 50 ADT, are providing limited residential or ranching land uses, are under single property ownership, have no perfected right-of-way, do not serve a need for public hiking or bicycling connections, and are unlikely to have significant development growth warranting continued	X				
Improve and provide prioritized maintenance on Brooks and Central Ave roadways (within three miles of the PM10 violation site) by the year 2020.	X				
Improve Post Ranch Rd to an adequate standard to facilitate east-west connection between the Benson/ St. David area and the Whetstone/Sierra Vista area.		X			*
Improve Norland Rd through Paradise to Portal Rd to facilitate recreational travel connections from the San Simon area to Douglas.			X		
Improve Turkey Creek Rd and associated bridges, to facilitate recreational travel connections to the Coronado National Forest.			X		

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
ROADWAY SYSTEM - PRESERVATION					
Build up the capacity of the Highway and Floodplain Department staffing, including the training of staff to replace pending retirements, to meet basic maintenance needs.	✓	✓	✓		*
Routinely conduct vegetation removal and tree trimming to provide clear sight distance and reduce wildfire fuels along roadways.	✓	✓	✓		*
Continue to replace and upgrade County signs to meet current and future MUTCD standards; monitor nighttime reflectivity on a regular basis.	✓	✓	✓		
Upgrade and maintain striping from 4 to 6 inches on major and minor collector roadways, using reflective pavement markers on both center and edge striping where nighttime off-road departures frequently occur.	✓	✓	✓		
Design and implement roadway and pathway lighting in compliance with the County's lighting code balancing the viability needs of the traveling public with the preservation of dark skies.	✓	✓	✓		
Provide re-seeding of native grasses, wildflowers and shrubs in areas of project disturbance to assist with erosion control, deter off-road travel and enhance the visual aspects of both pedestrian and vehicle travel corridors.	✓	✓	✓		
Develop an iconic Cochise County sign standard and identify, potentially as part of a future Pedestrian Plan, locations for directional, informational, or educational signs and/or pull-outs.	x				
Use traffic calming striping techniques in areas where widening is cost prohibitive or traffic volumes do not warrant it but speeding and/or sight distance are of concern.		x			
ROADWAY SYSTEM - BRIDGES AND CULVERTS					
Coordinate with the ADOT Bridge group for ongoing inspections of bridges and culverts: request and obtain scour inspections when needed.	✓	✓	✓		*
Routinely clean out overgrown vegetation impeding heavy storm-water flows and re-enforce gabions, scour-floors, headwalls and other drainage structure support as needed in advance of the summer monsoon season.	✓	✓	✓		*
Maintain adequate storm drainage ditches to handle storm water runoff along roadside to deter storm-water from working its way under paved surfaces or ponding on natural surfaced roadways.	✓	✓	✓		*
Provide for proactive protection measures on older bridges with evidence of head-cutting, bank deterioration or changes in the floodplain increasing storm-water flows.	✓	✓	✓		*
Plan to replace or substantively repair a minimum of 2 bridges annually	✓	✓	✓		*
Plan to replace or substantively repair a minimum of 5 arch culverts, culverts or low water crossings annually	✓	✓	✓		
RAILROADS AND RAILROAD CROSSINGS					
Develop and maintain working relationships with the Railroad companies within Cochise County	✓	✓	✓		*
Provide appropriate warning signs for bicyclists at corridor railroad crossings.	✓	✓	✓		
Coordinate with the State to conduct a safety and maintenance analysis of all railroad crossings and prioritize improvements to existing railroad crossing warning systems		x			*
Consider partnerships with ADOT for the use of Railway-Highways Crossing (Section 130) Program funds for the elimination of potential hazards at identified County railway-highway crossings. These funds may also be used for the installation of traffic signs and signals.		x			
Identify the best railroad crossing location for the future St. David extension route and obtain adequate rights-of-way in advance of the construction phase			x		
Protect through temporary alternative uses (e.g. Rail to Trails Programs) appropriate railroad rights-of-way for future high-speed or freight rail corridors.			x		
TRANSIT SYSTEM					
Provide staff and data support to the SEAGO Transportation Coordination Plan update	✓	✓	✓		
Provide mandated public notices coordinated county-wide for annual grant application processes.	✓	✓	✓		
Support AZTA: the state-wide transit advocacy organization informing state elected officials of the priority needs of the transit dependant and transit choice riders.	✓	✓	✓		
Develop and adopt IGA's with transit providers and non-profits with 5300 funded fleets for evacuation and emergency services	x				
Develop infrastructure connections for transit stops; where appropriate, request residential and commercial developers to plan for and provide transit stops		x			
Assist with match funds to eligible non-profits for the current 5310/5311 or other state-funded transit programs for planning activities, shelters, buses and/or operating expenses.		x			
Coordinate with fleet management to provide required maintenance and repairs for 5300 program vehicles on ADOT liens that serve incorporated Cochise County residents		x			
Work with private transportation vendors to provide services to regional general aviation airports and major employment sites			x		
Sponsor Train the Trainer and other training programs within the County for transit service providers.			x		

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
BICYCLE TRANSPORTATION SYSTEM					
Create and support a stakeholder group that brings together the advocacy groups for bicycling, pathway and trails to develop joint recommendations and prioritize future projects.	✓	✓	✓		
Develop and adopt a County Bicycle Route plan and map.	✓	✓	✓		
Develop and adopt standards for bicycle racks and support facilities to encourage use during the development review process.	✓	✓	✓		
Encourage the addition of bicycle racks as part of development, where appropriate.	✓	✓	✓		
Encourage and support the addition of designated bicycle routes on the state highway system.	✓	✓	✓		
Widen and appropriately stripe paved shoulders following current AASHTO *Guide for Development of Bicycling Facilities.*	✓	✓	✓		
Provide railroad and cattle guards warning signs for bicyclists; follow the *Manual on Uniform Traffic Control Devices* (MUTCD) standards for proper bike lane signing.	✓	✓	✓		
Participate in the development of the US Bicycle Route 90 through the Cochise County segment and support route selection with appropriate Board action (such as a Letter of Support or a Resolution).	x				
Provide, where appropriate, share use path etiquette/best practices welcome and courtesy signs, along with public outreach, to educate pathway users on how to share the pathway among different types of users.		x			
Provide one FTE staff person to focus on alternative mode travel issues; including bicycle route development, seeking and managing grant and private funding and supporting bicycling events and activities throughout the County.			x		
PEDESTRIAN SYSTEM					
Partner with the School Superintendent's office and School Districts to encourage and support the expansion of the Safe Routes to Schools program concepts county-wide.	✓	✓	✓		*
Develop and construct an estimated 2 miles of sidewalk, pathway or trail each year.	✓	✓	✓		
Identify opportunities to preserve or develop pedestrian connections to public lands, trails, parks or schools through the development review process.	✓	✓	✓		
Identify and develop alternative mode linkages to support economic development, tourism and sense of place.	✓	✓	✓		
Create and support a stakeholder group that brings together the advocacy groups for bicycling, pathway and trails to develop joint recommendations and prioritize future projects.	✓	✓	✓		
Conduct a minimum of one SRTS assessment per school year; develop a trained assessment team within Cochise County by the year 2020.	x				
Complete a pathway and trails plan with policy, recommendations, implementation dates and identification of potential funding source by the year 2020 and update at least once by the year 2040.	x				
Develop a recreational amenities maintenance program within the Highway Dept. Operations Division to ensure future maintenance of the bicycle and pedestrian facilities, including trailheads and transit stop mini-parks.		x			
Complete a minimum of 10 enhancement projects to the transportation system by the year 2040.			x		
AVIATION SYSTEM					
Coordinate with both the FAA and ADOT Aeronautics to implement the recommendations of the Master Aviation Plans for the Cochise County's airports.	✓	✓	✓		*
Provide development review of private airstrip requests and ensure notification of potential applications to Fort Huachuca and FAA of new airstrips.	✓	✓	✓		
Preserve and protect adequate airspace around military and general aviation airports.	✓	✓	✓		
Coordinate within County departments to leverage resources to provide infrastructure improvements to airport access aprons, parking and driveways.	✓	✓	✓		
Prioritize improvements and transportation enhancements to general aviation airport access roadways.			x		
Apply for FAA funds to conduct a regional aviation plan for all of Cochise County's general aviation airports by the year 2040.			x		

2040 COCHISE COUNTY LONG-RANGE TRANSPORTATION PLAN

Recommendations	Prioritization				
	2015 - 2025	2025 - 2035	2035 - Beyond		Top Priority
TRANSPORTATION FUNDING					
Additional local revenues will be needed within the horizon year of this plan in order to meet basic maintenance needs of the existing transportation system. A commitment to a public outreach and education effort will be needed within the next ten years to discuss this issue with County residents.	✓	✓	✓		*
Although federal, state and regional funds are tied to expensive and time consuming requirements, at this time these are the only fund sources large enough for capacity improvements. Provision of staff dedicated to grant writing and federal project management may be necessary in the short-term in order to obtain project funding for the later phases of the 2040 LRTP.	✓	✓	✓		
Partnerships with other agencies, jurisdictions, private developers and citizens will be necessary in order to be cost effective with limited resources. Developing these relationships at all levels of County government will be necessary for leveraging available revenues and being prepared for new funding opportunities.	✓	✓	✓		
Elected official advocacy directly at the state level to address on-going state raids on state-shared highway revenues should continue to be undertaken, along with educating County residents, and soliciting their assistance, to advocate with their federal and state officials for adequate funding for the construction, improvement and maintenance of the County's transportation infrastructure.	✓	✓	✓		
The County is encouraged to form a Citizen's Technical Advisory Committee to study and make recommendations to the Board of Supervisors regarding the shortfall in available revenues to meet basic maintenance and future capacity transportation needs.	✗				