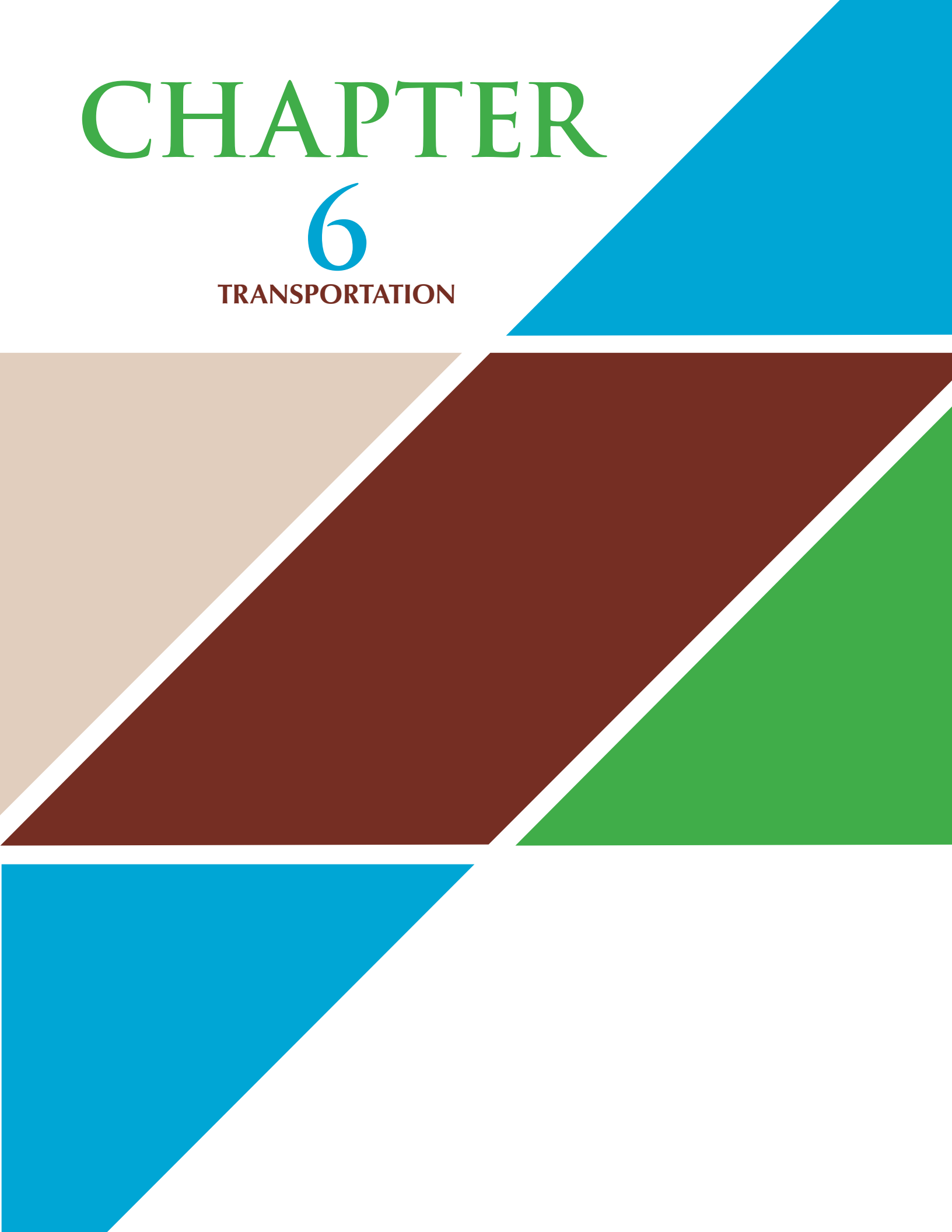


# CHAPTER

# 6

## TRANSPORTATION





Anonymous, Community Event, 2022

# TRANSPORTATION

## BACKGROUND

Transportation in the 21st century is a technologically evolving and vital infrastructure that also affects the health of the environment and the community. Updating and improving the current transportation infrastructure requires alignment of all six of the Regional Plan priorities combined with the technical challenges of emerging technology and standards and practices in roadway and vehicle design. Transportation is also crucial to addressing the two emergencies that the City has declared for [climate change](#) and housing. Transportation costs and limited alternatives to automobile travel are contributing to the community's affordability crisis. The [GHG](#) emissions from the transportation system in the City account for 30 percent of total GHG emissions, which, in turn, lead to negative health outcomes and impact the ability to address carbon emissions.

### Flagstaff Regional Transportation Network

The Region has overlapping surface transportation networks including railroads, County roads, City streets, forest and rural roads, interstates and highways, bikeways, sidewalks, and trails in a variety of configurations and designs. These networks support driving, transit, passenger and freight rail, air travel, walking, biking, and [micromobility](#) for the Region's residents and visitors.

### Roads and Streets

The Region's roads and streets vary in their [functional class](#), purpose, width, design, and volumes. Engineers use these metrics to understand how roads should operate and what about them requires monitoring. Some City streets experience a high average daily traffic volume while some unpaved forest and rural roads see only a few vehicles a day. Drivers on roads such as Milton Road experience delays not only because of traffic volume, but also because of lack of connectivity with other roads and a lack of safe bicycle and [pedestrian](#) infrastructure to support alternative transportation. A lack of connectivity limits distribution and circulation options for drivers and creates inconsistent patterns on the connecting roads. Most of the Region's road network lacks a regular grid pattern of streets. A network with irregular spacing and alignments has evolved over time to serve expanded needs of the community. These irregular roadways funnel into limited crossings at the Burlington Northern Santa Fe (BNSF) Railroad and I-40. The uneven patterns make syncing traffic signals difficult, and the lack of options in certain areas contributes to congested conditions at times. Efforts to increase the Region's connectivity are being made, in part, to address congestion issues. These include the railroad overpass at Lone Tree Road and connecting JW Powell Boulevard to Fourth Street. Both of these roads create redundancy in the transportation network and they facilitate successful development and redevelopment of the adjacent land.

#### Regional Transportation Network Facts

- » 943 miles of roads and streets (Region)
- » 1,942 lane miles (Region)
- » 59 miles of [FUTS](#) trails (Region)
- » 300 miles of public sidewalks (City)
- » 60 miles missing sidewalks on major streets (City)
- » 97 miles of designated bike lanes (City)
- » 34 miles of undesignated shoulders (Region)\*
- » 71 percent of major streets with bike lanes (City)
- » 70 miles of missing bike lanes (City)
- » 23 percent of all trips in the City are made by walking, biking, or transit<sup>13</sup>


\* *Undesignated shoulders is the term used by the Arizona Department of Transportation (ADOT) to describe an area on the road pavement that is striped separately for bicyclists and other non-vehicle road users.*



South Beaver Street at Butler Avenue

As the Region grows, the community can invest in building more roads and more lanes to attempt to reduce traffic, or can manage demand, decreasing the need for vehicle trips and vehicle infrastructure. This is a crossroads that many communities have faced as they strived and failed to build their way out of congestion. Building and improving roads can be a necessary step to support land use development and redevelopment, but the way it has been carried out produced different outcomes. In the City, new subdivisions over a certain size are required to have at least two points of access to ensure areas can be evacuated during fires and other emergencies. On the other hand, expanding roadways for [infill](#) and smaller developments is the most expensive option for improving transportation. Nevertheless, for most of the 20th century, it was the default decision when communities faced growth and congestion. What has been learned from these decades of decision making is that expanding roadways typically induces more driving. Short-term gains in travel delay are lost as drivers are attracted to roads with less congestion and shorter travel times. In many cases, these roads end up just as congested, and much sooner than transportation models had forecast. This short-term benefit is achieved at the expense of transit and [active transportation](#) options. While not everyone will use these options, making them more available and more attractive promotes more efficient transportation systems. Wider, busier roads are uncomfortable for some non-vehicular users, discouraging the use of alternative modes of transportation.

Even though the focus of the transportation policies is working to address congestion with different tools, the City has already planned and funded key road connections for the community's future growth. In 2018, City voters approved two propositions that authorized 10.9 miles of new roads and widening projects for major and minor arterials with dozens of bicycle and [pedestrian](#) improvements City-wide. This package of road improvements also included the Lone Tree Overpass over the railroad tracks to create an additional north-south connection near downtown (see [Policy Maps 4-3](#) and [4-5](#)). Although these propositions extended and expanded the transportation tax with expected revenue of \$266 million over 21 years, the approved tax covered only 15 percent of the anticipated bicycle and pedestrian improvements necessary to support a [multimodal](#) network that can address transportation costs and [GHG](#) emissions as outlined in the [2022 ATMP](#).



A key component of creating a comprehensive and [inclusive](#) transportation environment in the Region is considering the safety and comfort of travelers using various modes of transport. One method for creating safer transportation spaces is to design streets with narrower motor vehicle lanes. Drivers tend to drive more slowly in narrow lanes, and speed is a major factor in the severity of vehicle collisions. A [Johns Hopkins University study](#) conducted on 1,117 street sections found that reducing vehicle lane widths can result in significantly fewer non-intersection traffic crashes, providing a safer environment for automobiles and alternative modes of transportation.<sup>1</sup> Narrower streets provide additional space for features, such as bike lanes, street tree coverage, or [traffic calming](#) devices that lead to a more comfortable bicycle and [pedestrian](#) experience and a more robust transit experience. Potential options for appropriately designating areas for narrow streets include specifying lane width in lane design standards or even implementing a context classification system for road design based on area needs. Narrower streets are also easier to create safe crossings for pedestrians, bicyclists, and [micromobility](#) users.

**In 2021 the City embarked on a program called the “Big Shift”** to reimagine the cycle of short-term gains and long-term losses and improve the community’s quality of life, health, [sustainability](#) and affordability. The Big Shift prioritizes managing demand, reducing VMT, and prioritizing walking, biking and transit while building systems that create useful, safe, and comfortable paths of travel between the places people need and want to go. This is a fundamental change in how the transportation system is designed and how people move around the community. The Big Shift requires considering how the City can best utilize its limited space and funding in [rights-of-way](#), rethinking parking requirements, allowing new approaches to managing traffic demand, and designing or re-purposing streets to slow traffic and foster community connections. Other approaches include creating connectivity for all modes to reduce travel distances; supporting the transition of the City’s streets to [multimodal](#) travelways by updating its Engineering Standards; increasing micromobility access and infrastructure; and designing, building, and improving streets so they are safer and more comfortable for pedestrians, cyclists, and transit users.

## [Active Transportation](#)

Active transportation is a human-powered mode of transportation, such as walking or biking, that can be used for both leisure and practical purposes. Active transportation users find numerous roadways in the Region uncomfortable, inaccessible, or even dangerous to cross because the corridors are wide, and because of the speed and volume of traffic. These types of roadways create barriers in the walking and biking network.

Walking and biking are critical modes of transportation for the significant portion of the community who cannot drive or do not have access to a vehicle. They are also important elements of a robust transportation system and are integral parts of a larger context of land use, community character, and street design. In 2022, the City adopted the [ATMP](#) which set forth objectives and actions to provide better support for walking, biking, other forms of micromobility like scooters and skateboards, and transit use. The ATMP targets increasing active transportation from 27 to 54 percent of all trips, and from 17 to 34 percent of trips commuting to and from work, by 2042.

As of 2024 there were just more than 59 miles of [FUTS](#) trails in the City. The overall master plan shows about 80 miles of future trails, to complete a planned system of 130 miles to support regional [mobility](#) and [accessibility](#) for active transportation (see [Policy Maps 4-5](#) and [4-6](#)). In combination, the FUTS and Bikeways Policy Maps introduce a more robust network than conventional bike lanes and the FUTS alone. The proposed [layered network](#):

- » Is designed to be low stress and comfortable, so most users would feel safe and comfortable riding a bicycle, regardless of their skill level.
- » Establishes a hierarchy, with primary [bikeways](#) serving as the backbone system of main routes for crosstown and regional bicycle travel.
- » Integrates functionality and transition across a variety of facilities.
- » Is comprehensive and cohesive, so anyone can travel conveniently and easily by bicycle to destinations and neighborhoods throughout the community.

Providing [enhanced](#) and [grade-separated crossings](#) (see [Policy Map 4-8](#)) is another key element to providing safe, comfortable access where roads intersect with the [FUTS](#), [bikeways](#), and other trails and paths within the active transportation network. Enhancements can be used at any crossing location; however, they are most beneficial at mid-block and uncontrolled crossings (i.e., crossings that do not have signs or traffic signals). Combinations of enhanced crossing treatments are the most effective and can improve [pedestrian](#) and cyclist crossings on high-volume, high-speed roadways. Typical treatments include median refuge islands, advanced yield lines, curb extensions, landscape features, pedestrian activated flashing beacons, advance warning signage, and pedestrian-scaled lighting. Pedestrian crossings are an essential element of a robust transit system especially when they provide a safe connection to and from transit stops and final destinations.

See the [Transportation Framework in Chapter 4](#) for Urban and Regional Trails, Bikeways, and Crossings maps.

**Electric micromobility is changing how people get around Flagstaff.** It is an emerging component of transportation electrification. Micromobility technology is a rapidly evolving category of light-weight individual transportation devices. Electric micromobility devices assist people in moving around more quickly than a traditional bicycle or scooter and require significantly less physical effort. These devices use very little electricity, especially when compared to the amount of gasoline required to drive a vehicle. If used as an alternative to vehicle commutes, they remove vehicle traffic from the road and have a small footprint, reducing congestion, [GHG](#) emissions, and parking demand. These devices are present in the Region, and are already providing accessible, affordable, low-carbon transportation options. Users can buy them at local and national retailers. To support further adoption of micromobility devices, it is important to provide safe and comfortable routes for micromobility users and consider these devices alongside bicycles and pedestrians when planning for shared streets.

## Transit

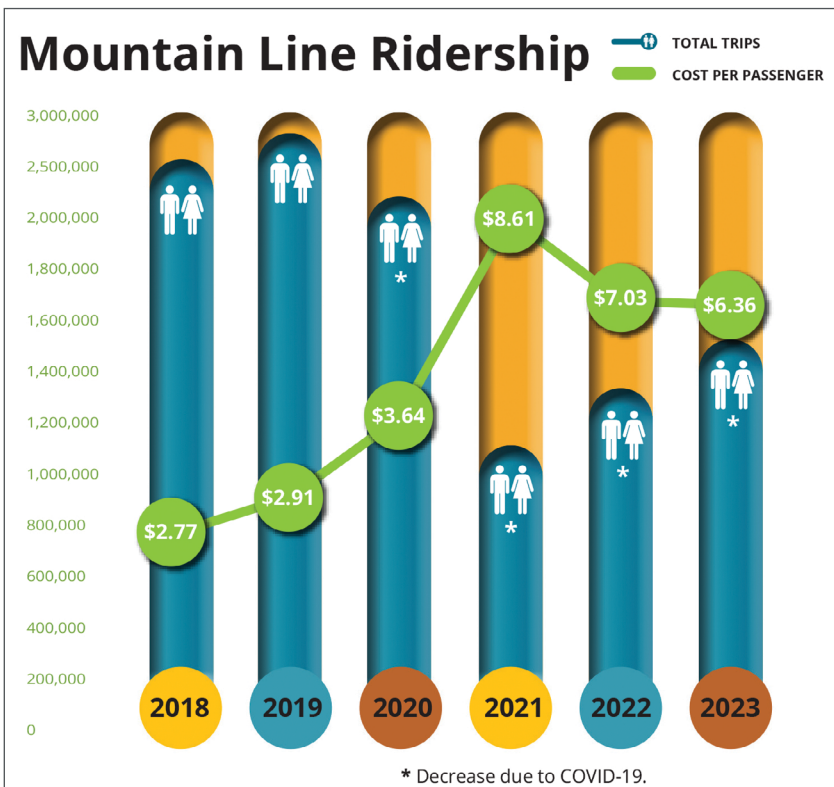
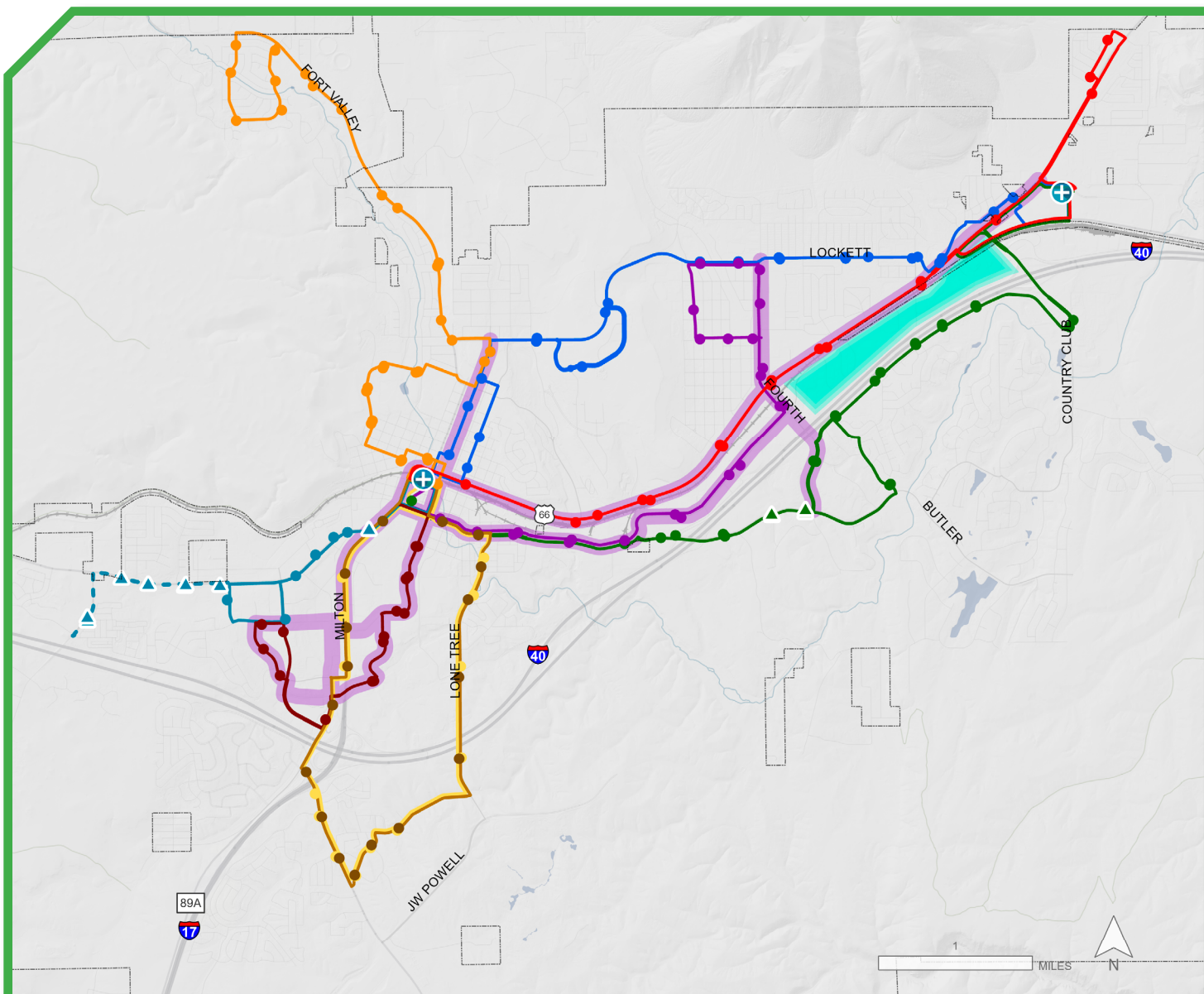


Figure 6-1: Mountain Line Ridership 2018-2023. Source: Mountain Line Fiscal Year 2023 Annual Report

The Mountain Line transit system is a critical element of the Region’s transportation system and daily travel. Sixty-five percent of transit riders say Mountain Line is their only source of transportation; 40 percent of riders use Mountain Line to get to work; and 25 percent of riders use Mountain Line to get to school.<sup>2</sup> Currently, Mountain Line provides fixed-route service and [paratransit](#) within City limits. The agency provides a rideshare program in the County and has a subsidized taxi program for paratransit for the Region.

Mountain Line operations and ridership grew steadily from 2001 to 2019. In 2001, Mountain Line started with four routes and 100,000 trips. By 2019, service had increased to nine routes and 2,500,000 trips. The COVID-19 pandemic impacted ridership; and in 2023, transit ridership was 62 percent of what it was in 2019. Mountain Line currently operates nine



**Moutain Line Stops**

- Route 2
- Route 3
- Route 4
- Route 5
- Route 7
- Route 8
- Route 10
- Route 14
- Route 66
- ▲ Planned Route 3 Stop
- ▲ Planned Route 8 Stop

**Moutain Line Routes**

- Route 2
- Route 3
- Route 4
- Route 5
- Route 7
- Route 8
- Route 10
- Route 14
- Route 66
- - - Planned Route 8 Extension

- ⊕ Connection Center
- Mountain Line GO! Area
- Mountain Line Permanent Transit Network



Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community

Information Map 6-1: Transit Network, 2024



routes within the City out of the Downtown Connection Center where, every day, 355 buses pulse in and out.

Mountain Line's 2023 Five-Year Transit Plan, [Flagstaff in Motion](#), has two main goals that guide improvements to increase transit ridership. The first goal is to target areas with the highest ridership potential. The second goal is to support transit-dependent populations. Major considerations in the evaluation and prioritization of transit improvements are to increase access and [equity](#), and to align with efforts to help solve major community issues around affordability, climate action, housing, workforce shortage, and transportation infrastructure. The transit improvements outlined in the Mountain Line plan are for buses to arrive more often and for longer periods of time on the majority of routes Monday through Saturday, and to add coverage to new areas such as along West Route 66 to Woody Mountain Road.

As of 2024, 60 percent of the City population lives within a quarter mile of a Mountain Line stop and 80 percent of jobs in the City are within a quarter mile of a transit stop. In 2021, Mountain Line added a [micro-transit](#) service in the Huntington and Industrial corridor, an area hard to serve by a fixed route but with a high concentration of human service organizations. Mountain Line [paratransit](#) services provide an "ADA Guaranteed Ride Area," which is an origin-to-destination, demand-responsive service that mirrors the fixed-route services' times and areas. Mountain Line also has a vanpool, which provides a shared-ride program throughout the County. As of 2024, Mountain Line did not have fixed-route service outside City limits; its primary funding source is a City sales tax dedicated to transit.

A Permanent Transit Network (see [Information Map 6-1](#)) serves as a spine for the Mountain Line system. It provides opportunities for transfers and to create a transit-supportive land use pattern. The Permanent Transit Network serves the most central Urban Centers, Neighborhoods and Corridors, and some Suburban Centers and Corridors. The connection between the land use pattern, a complete and comfortable [pedestrian](#) and bicycletnetwork, and transit services in these areas is important for reducing the cost and environmental impacts of transportation within the Region.

## **Airport, Rail, and Freight**

Flagstaff Pulliam Airport is a City-owned, regional commercial and general aviation airport that serves Northern Arizona. It is the highest elevation airport in Arizona and comprises 795 acres, which include [aviation easements](#) on the Coconino National Forest. The City constructed the airport in 1949. It provides access for airline passengers, cargo aircraft, private general aviation aircraft, and public safety aircraft. Its facilities include the passenger terminal, Aircraft Rescue and Firefighting Station, Wildland Fire Management Station 10, airport-owned aircraft storage hangars and shades, privately operated aircraft storage and maintenance facilities, and parcels that provide direct access into the airport for aviation related businesses. The airport is accessible from I-17 and has several vehicle rental businesses. There is currently no public transit serving the airport.<sup>3</sup>

The BNSF Railway operates freight rail on the transcontinental railroad that runs through central Flagstaff, and in the County, including the communities of Bellemont and Winona; through Amtrak, it permits passenger rail service on its line. The rail connects the ports of Southern California with the midwestern states and the Mississippi River. Demand for freight rail is expanding. To increase safety and efficiency, BNSF is working in coordination with the Rio de Flag Flood Control Project and the Downtown Mile Project to complete a third rail next to the two existing rails.

Amtrak services rail and bus passengers at the train station in Downtown Flagstaff, which is Amtrak's busiest Arizona train station. Ridership peaked in 2019 at 43,463 and then declined for two years due to the COVID-19 pandemic. In 2022, ridership was 26,266 passengers.<sup>4</sup>

Freight also moves through the Region on commercial truck routes. Both I-17 and I-40 are classified as part of the Primary Highway Freight System and I-40 in particular aligns with the Strategic Road Corridor Network. The segment of I-40 between the City and Winslow carried an Average Annual Daily Truck Traffic of more than 7,500 trucks.<sup>5</sup> For cross and through-town freight, the City's Engineering Design Standards and Specifications identify truck routes as areas of emphasis for safe and efficient local freight trips on existing and future roadways.

# TRANSPORTATION FINDINGS FROM THE SCENARIO PLANNING PROCESS

The scenario planning process highlighted several key concerns about regional transportation. First, it revealed the challenges of maintaining and expanding transportation infrastructure as the Region grows. New development, particularly in areas without existing [infrastructure](#), requires significant investments in transportation and other utilities. These investments involve up-front costs and require a commitment to on-going maintenance. The larger and more spread out the transportation system becomes, the more costly it is to maintain. If funding for transportation cannot keep pace with growth, the Region could face a poor fiscal outlook.

As [Chapter 4, Growth and Land Use](#) explains, the Preferred Scenario for the Region addresses these concerns by prioritizing alternative transportation choices and encouraging [infill](#) development. This results in improved biking, walking, and public transit infrastructure and yields the largest reduction in driving per household compared to the base year (2019). In the Preferred Scenario, the Region would:

- » Encourage higher density development near public transit investments.
- » Support safety and convenience for the most vulnerable road users.
- » Reduce reliance on the automobile.



Milton Road

## Encourage Higher Density Near Public Transit Investments

One of the future challenges identified by the scenario planning process was the potential for lower state and federal transportation funding. Continuing to serve development in areas far from existing [infrastructure](#) will be costly and could prove challenging if funding levels decline. To navigate this challenge, the scenario assumes better coordination between transportation investments and areas where higher density development is planned. The Preferred Scenario achieves this by concentrating new growth around existing and planned infrastructure – specifically Mountain Line’s existing fixed-route bus network and the improvements proposed by the City’s [ATMP](#). The location of these investments allows increased but still limited funding to be spent more efficiently and to create lower household transportation costs. Coordinating the location of [affordable housing](#) and public transit decreases the need for long commutes into the City. The same increase in funding spent in other areas or ways was shown to be less effective and would cost more to achieve the same desired results. The Preferred Scenario achieved the Region’s transportation vision by assuming increased local spending on transportation infrastructure that supports biking, walking, and public transit.

For additional information see the [Transportation Assumptions Memorandum](#).

## Safety and Convenience for the Most Vulnerable

One of the commonly heard themes during the scenario planning process was the need for the Region to improve infrastructure for vulnerable road users: people who walk, ride, roll, and use transit. In particular, many participants in the scenario planning process expressed a desire for prioritizing infrastructure investments in East Flagstaff and in the Region’s unincorporated communities. The scenario planning process explored this concept by testing two scenarios: Centers and Corridors and Neighborhood Infill that allocated growth and transportation investments near existing public transit infrastructure and high-priority, planned walking and biking investments included in the ATMP. Ultimately, many of these concepts were included in the Preferred Scenario, which helped to make it the scenario with the highest share of walk and bike trips.

For additional information see the [Active Transportation and Scenario Performance Highlights](#).

## Reducing Reliance on the Automobile

Reducing VMT is critical to reducing emissions from this sector, reducing the cost of living for residents who rely on vehicle trips, and reducing demands on shared infrastructure. While none of the scenarios tested reduce total VMT from 2024 levels, the Preferred Scenario resulted in the smallest increase. It also resulted in a decrease in VMT per household, which means the package of transportation investments and land-use changes results in the average household driving less than in 2024. The Preferred Scenario achieves this result by developing housing near Mountain Line’s existing transit infrastructure and in areas that are well connected to employment and commercial uses. It also minimizes density at the developed edge of the Region. Specifically, it replaces many of the Activity Centers in new growth areas such as the JW Powell Boulevard corridor with a less intense Suburban Neighborhood with Neighborhood Commercial opportunities. The Scenario focuses more intense development in places like Downtown, near NAU, and East Flagstaff. In [greenfield](#) areas the plan focuses on Neighborhood Commercial, Corridors, and Employment opportunities.

# FURTHER CONSIDERATIONS IN TRANSPORTATION PLANNING

**Intelligent Transportation Systems (ITS)** are integrations of wireless and wired communication and computers to improve the safety, mobility, and operations of the transportation system. ITS is a critical component of meeting the Region’s cost of development goals because it can increase the transportation system’s functionality for all land uses and support reaching higher densities at lower costs. Along Butler Avenue, the City invested in a fiber optic communications line that linked the traffic signals along the corridor so they can be monitored for malfunctions and adjusted for changing traffic due to construction, weather, and roadway closures, crashes, and other system disruptions. ITS solutions can also be employed to expand [Americans with Disabilities \(ADA\) accessibility](#), transit signal prioritization, and emergency vehicle access, and to support the future of vehicle automation.

## Transportation Demand Management

Transportation Demand Management (TDM) is a transportation policy approach to increase the efficiency of transportation systems by reducing or redistributing vehicle demand in a specific space or time, while simultaneously encouraging use of other, more-sustainable travel modes, including walking, biking, and transit.<sup>6</sup> About 37 percent of vehicle trips in the City are less than 2.5 miles long, and 11 percent are less than a mile. These short trips represent an opportunity to reduce congestion by shifting travel to [active transportation](#) modes and transit. At a practical level, TDM is a comprehensive collection of policy changes; improved [infrastructure](#) for walking, biking, and transit; parking management strategies; support and encouragement programs; incentives and disincentives; and land use changes. Some examples that have been implemented at NAU are parking fees, a bike library, transit way, and an internal bus system to support a park-once environment. In response to these strategies, apartment complexes have found it advantageous to offer bus passes as an incentive for residents who want convenient access to the NAU campus. The City and other businesses or institutions have many yet-to-be implemented options to manage travel demand further, ranging from code changes that would incentivize demand management to encouraging carpooling at Flagstaff’s kindergarten-through-12th-grade schools.



A bus stop on the NAU campus. Credit: Mountain Line



*South Beaver Street in snowy conditions*

## Safety

In 2022, the County's unintentional injury mortality rate from motor vehicle crashes was 11 percent higher than the national mortality rate and six-percent higher than the Arizona mortality rate. Motor vehicle crashes were the second highest cause of unintentional injury deaths in the County. Thirty-two percent of deaths of children aged one to 17 years were due to motor vehicle crashes. CCHHS has listed motor vehicle crashes as one of the top five physical health challenges in the community.<sup>7</sup> The safety risks on the roads and streets are not unique to this Region, but the exposure and risk within the Region are higher than average, which makes responding more urgent.

The City monitors crash incidents with serious injuries or fatalities across the roadway network and identifies which road segments have repeatedly had issues of crash severity, risk exposure, or high complexity.<sup>8</sup> In the past decade, crashes with serious injuries or fatalities have been steady or slightly decreasing in the City (see [Figure 6-2](#)), in contrast to national trends. The crash report helps staff prioritize projects that can increase safety where it is most needed and supports leveraging local funding with safety funding available through state and federal sources. Improving the safety of the network is critical to the transit and [active transportation](#) networks to support reducing vehicle dependence and meeting the City's [carbon neutrality](#) goal.

**Safe System Approach and Road to Zero:** Grappling with the increased risk of death and injury from transportation crashes in the US is a public health issue getting attention across the public and private sectors. The vision of eliminating fatalities and serious injuries on the nation's roads is shared through such parallel initiatives as Vision Zero, Toward Zero Deaths, and Road to Zero. The Federal Highway Administration (FHWA) promotes the Safe System Approach, which decreased road fatalities by 50 percent between 1994 and 2015 in Sweden and the Netherlands.<sup>9</sup> At the heart of all of these frameworks is a willingness to place safety as the principal consideration in road system investments and design work.

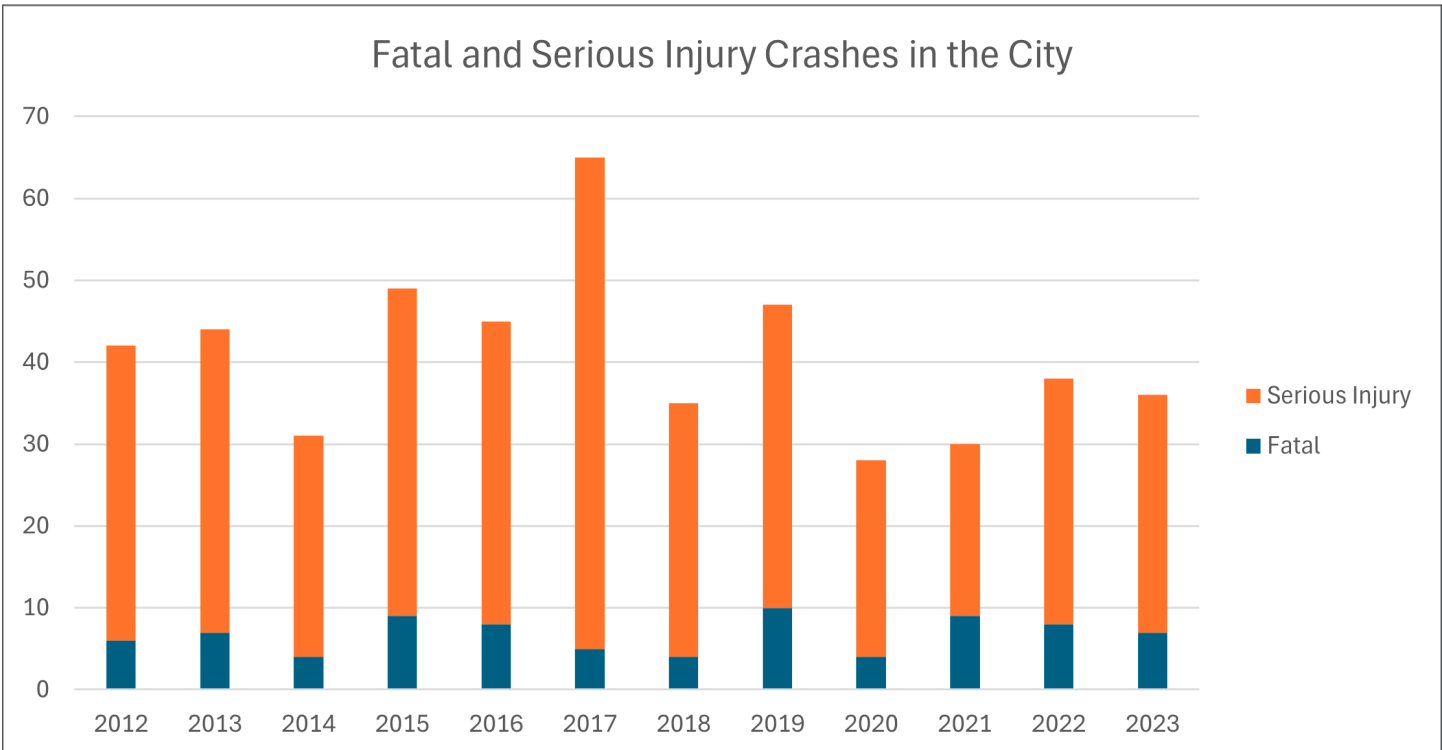


Figure 6-2: Fatal and Serious Injury Crashes in the City

The most vulnerable roadway users, or those who bear a disproportionate risk of injury or death, are people outside of vehicles, children, older adults, people with disabilities, people of color, and people walking in lower income areas.<sup>10</sup> [Transportation equity](#) means addressing the safety concerns of these most vulnerable of road users through improved design standards and the geographic evaluation of existing locations with increased crash severity and frequency. [Accessible](#) universal design is essential in addressing the needs of these most vulnerable of road users. Street level interventions and redesigns such as roundabouts, high visibility [pedestrian](#) crossings, accessible pedestrian signal devices, and [traffic calming](#) measures, are increasingly common. Additional projects such as these are needed to make a difference in the safety of the Region.

### Environmental and Climate Impacts

[Sustainable](#) transportation options are critical to meeting the City's [carbon neutrality](#) goal. The City's [Carbon Neutrality Plan](#) calls for 30 percent of internal vehicle miles traveled (trips that originate and end in the City) to be in [electric vehicles \(EVs\)](#) by 2030, in combination with encouraging switching to more [active](#) and [carbon-free](#) forms of transportation (see [Chapter 10, Energy and Climate Action](#) for more on EV charging infrastructure). Reducing [GHG](#) emissions will require a transition to clean, low-emission vehicles and increased [infrastructure](#), and support for, and use of active transportation, [micromobility](#), and transit. To achieve this goal, the City will need to prioritize developing safer, more comprehensive networks for all modes of transportation. This includes adopting policies and programs that manage single-occupancy vehicle demand more effectively, enhancing design standards, and promoting comfortable active transportation options.

## Streetscapes and Parking

Streetscapes are the collective appearance of the public and private elements of the view along a street. Streetscapes are dynamic and full of motion including the functional and aesthetic elements of the corridor's built and natural environment. In addition to the road, sidewalks, [bikeways](#), and other transportation features, public art, decorative features, street furniture, parkways, landscaping, seating, and other streetscape interventions may be used to provide benefits for public health, safety, economic development, and sense of community.<sup>11</sup> The concept of a streetscape recognizes that streets are for more than just vehicle movement and are connected and activated spaces with appropriate management and design. The Regional Plan manages enhanced streetscapes by acknowledging and considering [Great Streets](#) (see [Chapter 3, Goals and Policies](#) and [Chapter 4, Growth and Land Use](#) for more information).

In 2017, the City adopted a comprehensive parking program for the Downtown and surrounding areas including a paid parking district, residential and employee parking, and management of municipally owned surface lots. ParkFlag was founded as the operational management and enforcement section within the City with the objective of better managing the City's parking supply, providing a dedicated funding source for additional public parking, and promoting [multimodal](#) options for the Downtown area.

**Winter Parking:** The City's Winter Parking Ordinance is among the most restrictive in the country, prohibiting parking on City streets or alleyways from midnight to 7 a.m. between November 1 and April 1, regardless of weather conditions. The purpose is to allow crews to plow streets thoroughly, and it aids street sweepers in the removal of cinders following a snowstorm. However, very few cities with similar winter conditions approach winter parking restrictions as Flagstaff does. Many other snowy cities do not impose any winter parking restrictions. Other cities maintain the ability to establish parking restrictions if hazardous conditions require it or they employ odd/even parking strategies. Odd/even parking requires residents to park on one side of the street based on the calendar date. For example, on odd-numbered days, vehicles park on the odd-numbered side of the street, and on even-numbered days, parking is allowed on the opposite side. This practice also enables snowplows to clear streets effectively, while still allowing residents to take advantage of street parking.

[Curbside management](#) strategies balance the need of all roadway users in making decisions about the use of the edge of the right-of-way, an area that historically was exclusively a spot for vehicle parking and commercial loading. Curbsides can also be evaluated for [placemaking](#) opportunities or as supportive extensions of adjacent businesses. In response to restrictions on indoor gatherings during the COVID-19 pandemic, the City took a renewed look at managing the space in the [right-of-way](#) to support businesses and restaurants. These expanded uses of the rights-of-way included planters and barriers to close streets for summer activities, alley closures for [pedestrian](#)-only use, and parklets for restaurant seating. A parklet is a small public space created by repurposing one or more on-street parking spaces. Today, some of these temporary features have become longer term curbside shared spaces. A broader definition of curb space that support communities now includes traditional demands as well as bike share stations, scooter corrals, mobility hubs, outdoor dining, or gathering spaces.<sup>12</sup> Curbside management programs and designs can also address the increasing demand for delivery, ride sharing, and other technology-driven transportation changes that require additional drop-off and pick-up locations.

The County's Engineering Design and Construction Manual provides standards and design requirements for transportation improvements within the County, including on rural roads. Streetscape features in the County differ from those in the City and do not include as much variety or intensity of parking, multimodal and transit needs, and curbside features. When funding is available, the County streetscape work focuses on opportunities to provide multimodal improvements such as multi-use trails, widened asphalt roadway shoulders, and other design features on rural roadways.

## Action Items

High Priority Action Items (see [Appendix C](#) for additional information).

Type of Action	Item	Timing
Fund	Evaluate alternative methods of snow removal to allow for year-round, on-street parking, and <a href="#">multimodal</a> travel (City only).	Short term
Plan	Complete a transportation master plan for the City.	Short term
Fund	Establish rural transit service within the Region that is consistent with County land use plans based on funding availability, cost effectiveness, location of major trip generators, distance between generators, and the needs of transit-dependent individuals.	Mid term

Other Action Items: While important, these projects may be prioritized as opportunities and funding arise.

Type of Action	Item	Timing
Plan	Increase the number of <a href="#">grade-separated</a> railroad and interstate crossings.	Long term
Code	Update the City Subdivision Code and Engineering Standards to improve network connectivity and <a href="#">accessibility</a> for all travel modes and to create standards for the spacing of arterials, collectors, block sizes, and local road connections between adjacent neighborhoods.	Mid term
Fund	Incorporate the needs for ITS and electrification improvements in the <a href="#">CIP</a> and project design where appropriate.	Mid term
Plan	Evaluate the use of ITS signal technology to determine the appropriate signal prioritization for all road users including transit, emergency vehicles, and snowplows.	Mid term
Partner	Collaborate on integrating ITS capabilities and the potential establishment of a Traffic Operations Center.	Long term
Code	Develop better <a href="#">multimodal</a> evaluation tools in Transportation Impact Analyses and explore the potential for fees in support of affordability and <a href="#">active transportation</a> goals (City only).	Mid term
Code	Update City Codes to set consistent standards and processes for constructing transit improvements (City only).	Mid term
Partner	Partner with Mountain Line in corridor planning efforts and the transportation master plan.	Continuous
Fund	Continue to fill in sidewalk gaps and create new <a href="#">pedestrian</a> and bike crossings in the existing City <a href="#">infrastructure</a> (City only).	Continuous
Plan	Create wayfinding and other sign design standards to support more robust <a href="#">curb management</a> strategies.	Mid term
Code	Update traffic rules and devices to ensure the safe operation of <a href="#">micromobility</a> vehicles on streets, sidewalks, and bike paths.	Mid term
Plan	Account for all users, including pedestrians and bicyclists, during roadway operation, maintenance, storage, and snow operations.	Continuous
Fund	Maintain streets, pedestrian paths, <a href="#">bikeways</a> , crossings, and <a href="#">FUTS</a> trails in good condition and free of snow, debris, and obstructions so they are safe and functional for all users, regardless of transportation mode or ability.	Continuous
Plan	Pursue opportunities for creating public trailheads and linking urban trails to public lands while working to address unauthorized access points onto public lands.	Continuous



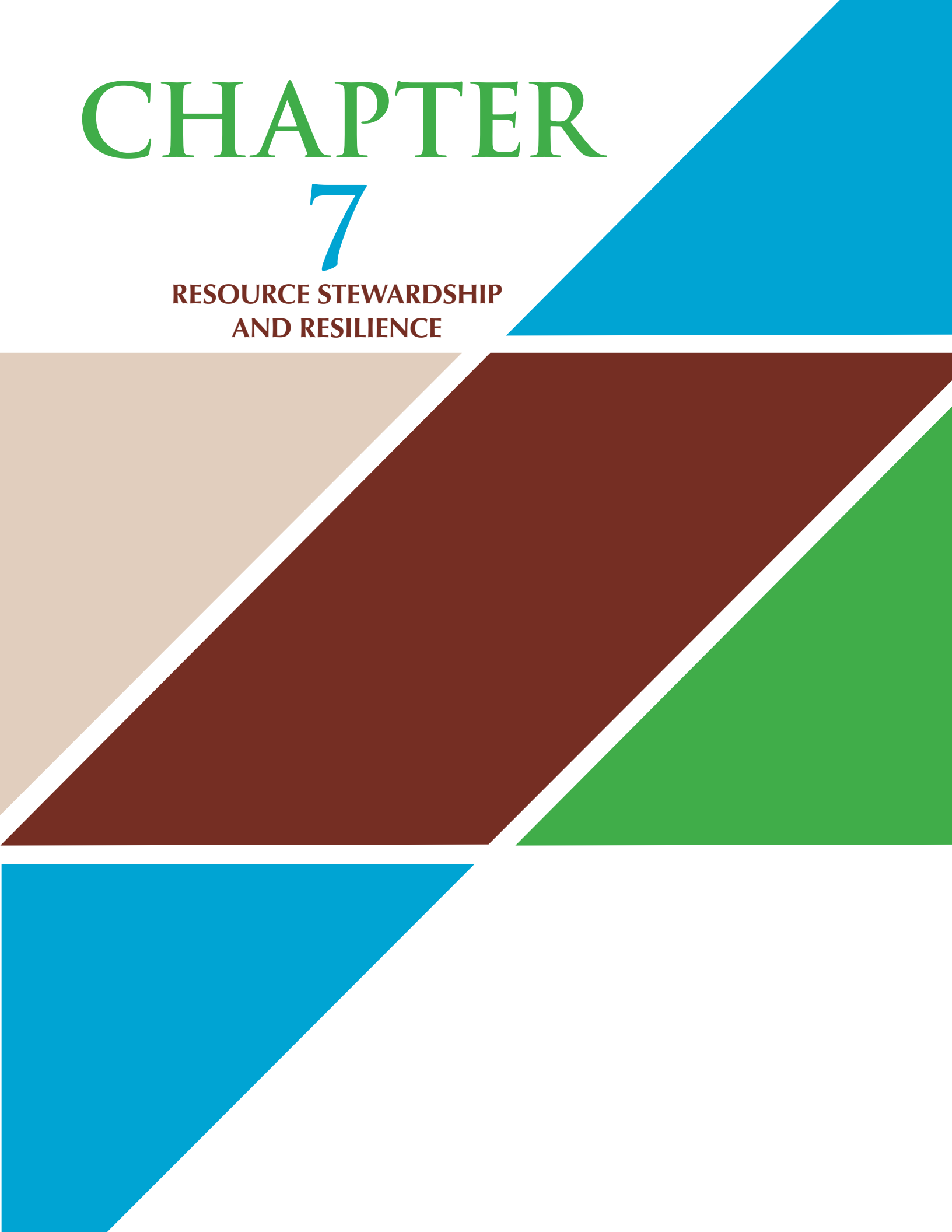
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# CHAPTER

# 7

## RESOURCE STEWARDSHIP AND RESILIENCE





Artist: Lily

# RESOURCE STEWARDSHIP AND RESILIENCE

## BACKGROUND

### Environmental Stewardship - A Place like No Other

The Region is a place where the natural and [cultural resources](#) and the community's relationship with the land, sky, and water are an incomparable gift. The three main summits of the San Francisco Peaks are a dramatic reminder of how the forces of fire and water have defined the Region's natural resources and provided a dynamic [ecosystem](#) that is reflected in its arts and sciences.

Stewardship of the natural and cultural environment is the shared responsibility of every person who lives, works, or visits the Region, including federal and state agencies, tribal communities, the City, County, private organizations, and their non-profit partners. With emerging risks from [climate change](#) including [uncharacteristic wildfire](#) and flooding, stewardship of these resources is an ongoing and evolving need.

### Environmental Planning

All the resources discussed in this chapter are interdependent with the people in the Region. They influence the Region's communities by affecting how individuals live, work, and play, and how neighborhoods function. Maintaining the balance between natural and human systems and providing for conservation and production of resources that support human development is a key part of environmental planning. Key land use topics in environmental planning that demonstrate the influence of people on the landscape are forestry, livestock grazing, agriculture and farming, energy development, mineral extraction, scenery and recreation management, and urban development. These topics are discussed in greater detail in [Chapter 4, Growth and Land Use](#), and [Chapter 8, Parks, Recreation, and Open Space](#).



*Snow-covered pines*



## Air

Air that is free of light and pollutants is a highly valued natural resource in the Region. Air quality metrics for ozone, particulate matter, nitrogen oxides, sulfur oxides, carbon monoxide, and lead are currently in compliance with the National Ambient Air Quality Standards; therefore, the Region is not subject to the statewide programs required for [non-attainment areas](#).

Particulate matter is a periodic air quality concern created by a mixture of solid particles and liquid droplets, sometimes including dust, smoke, dirt, and soot, that can influence the Region's air quality. These particles come in many sizes and shapes and can comprise hundreds of chemicals; some are emitted directly from a source, such as construction sites, unpaved roads, fires, or automobiles. Particle pollution of fine particles (2.5 micrometers or less in size) can cause serious health problems. Individuals who have lung diseases experience the negative consequences of particle pollution over a much shorter period of time.

The Region has experienced acute issues with particle pollution tied to smoke events such as local wildfires or wildfires burning as far away as California, Nevada, or New Mexico. Local fire management agencies coordinate beneficial fires (such as prescribed burns and beneficial wildfires) and other forest treatments to reduce the likelihood of high-intensity, long-duration smoke events; reduce the cumulative impacts to human health; and reduce the risk of [uncharacteristic wildfire](#). Not all impacts from prescribed burns can be avoided. The Region's fire-adapted forests require the frequent presence of fire to maintain natural ecological processes that also reduce wildfire risks and impacts to the community. While fire managers can oversee beneficial fire plans to mitigate smoke impacts for residents and visitors, [climate change](#) could lead to an increase in unanticipated high-severity wildfires that negatively impact air quality and, therefore, the entire Region.

## Dark Skies

The City and Northern Arizona have achieved worldwide recognition for innovative leadership in the protection of dark skies. Beginning in 1958, the City fostered one of the nation's most protected and treasured night skies. Both the City and County adopted comprehensive zoning regulations for outdoor lighting in 1989; since then, the codes have been periodically updated and strengthened. The purpose of these zoning regulations is to help assure that dark skies remain a resource for community members and visitors to enjoy, and to provide safe and efficient outdoor lighting that protects the Region's dark skies from careless and wasteful lighting practices. The Region's residents value dark, starry nights as a resource from which humans and nature benefit. Unlike other communities, residents throughout the Region do not have to drive to a remote vacation spot in a national park to experience the night sky. On October 24, 2001, Flagstaff was recognized as the world's first International Dark Sky Community for its pioneering work balancing preservation of its night sky natural resource with concerns about public safety and economic security.

The City and surrounding areas are uniquely suited for astronomical observation because of Flagstaff's legacy of protecting its night sky, along with the Region's topographic and atmospheric conditions. The Region now supports an astronomy industry that includes Lowell Observatory, the US Naval Observatory Flagstaff Station (NOFS), the Navy Prototype Optical Interferometer, the National Undergraduate Research Observatory, the US Geological Survey (USGS) Astrogeology Center, and the new Discovery Channel Telescope. In 2019, the NOFS completed a Mission Compatibility study to evaluate mission impact from light pollution, present findings, and outline recommendations for consideration by the City and County to minimize the impact to the dark sky and the NOFS military mission. The findings of this report were incorporated into the [JLUS](#) for Camp Navajo and the NOFS.

## Fire

Northern Arizona's Ponderosa pine forests and woodlands have existed for thousands of years and have evolved to benefit from frequent fires ignited by seasonal monsoonal weather patterns and [cultural burning practices](#) initiated by Indigenous people throughout the Region's history. A century of fire-suppression-based management has left the forest in an altered condition that puts the Region at great risk for high-severity wildfires, threatening its natural resources, economy, infrastructure, and human health. Landscape treatments, such as prescribed burns and selective thinning, and mitigations to the [built environment](#) are needed to protect communities and restore the [ecosystems](#) that are out of balance. See [Chapter 11, Infrastructure and Public Safety](#), for more information on fire-related partnerships and programs.

Climate models predict that the Region will face decreases in annual snowpack and an average temperature increase of up to a 5°F by 2050 because of human-caused [GHG](#) emissions.<sup>1</sup> The projected increases in temperature and weather volatility are expected to result in changes to the Region's forests, its vegetation and wildlife communities, and the community's systems and [infrastructure](#).



*Starry night skies above Flagstaff*



## Water

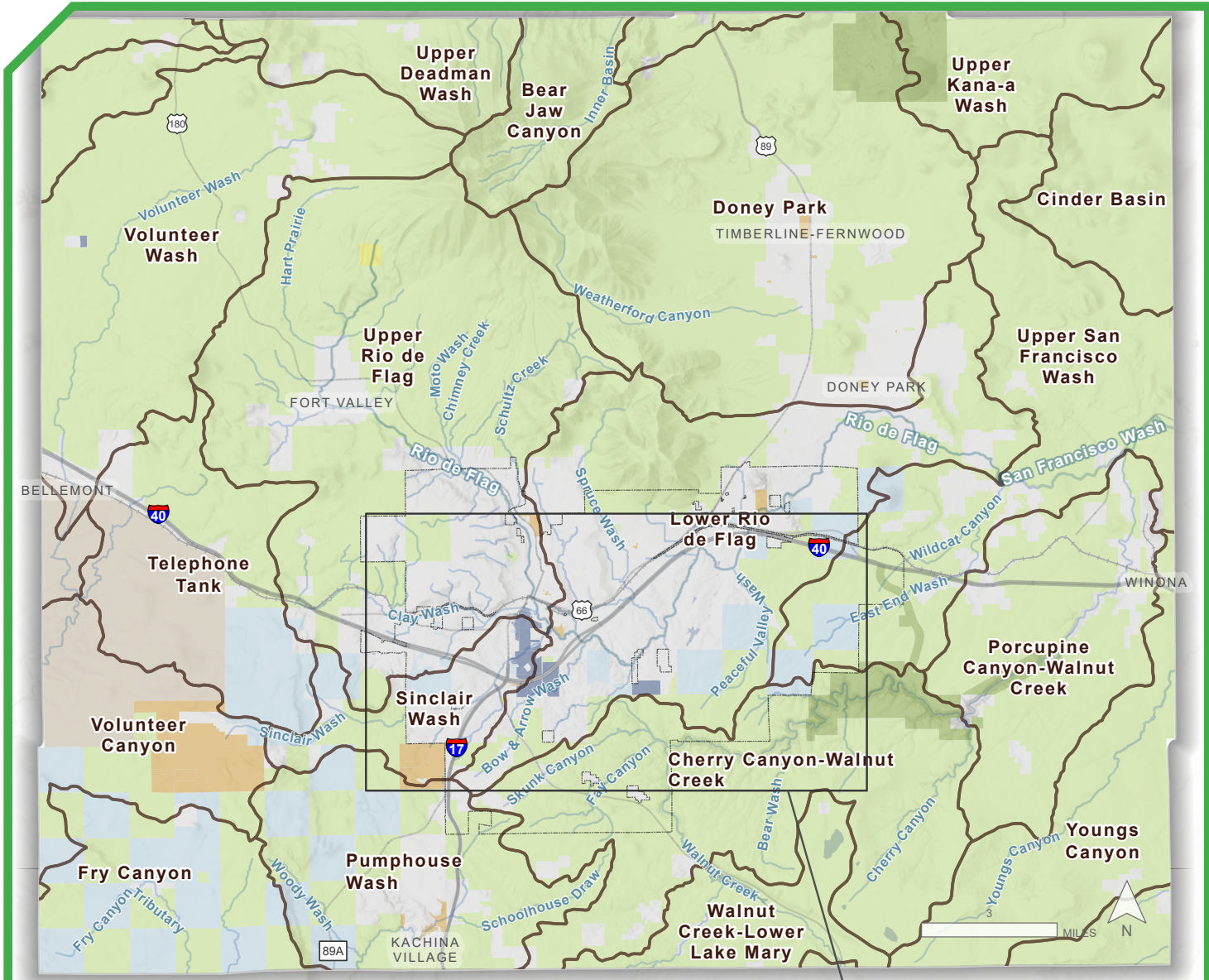
Watersheds are land areas that direct rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, aquifers, bays, and the ocean. They provide enormous [ecosystem](#) benefits and important functions, such as flood control, nutrient cycling, water storage and filtration, and soil formation, while supporting biodiversity, wildlife corridors, food production, and recreation. In fire-adapted ecosystems, watershed health can increase resilience to [uncharacteristic wildfires](#). Society benefits from a healthy ecosystem and the [services](#) provided, through clean drinking water, improved public safety, and recreation (see [Chapter 9, Water Resource Management](#), for more information on aquifers and drinking water).

The Region is primarily located in the Canyon Diablo subbasin of the Little Colorado River Watershed and the Upper Verde River subbasin of the Verde River Watershed as defined by the USGS's Office of Water Data. In the Region, the two subbasins are further divided into 22 watersheds. Three of these watersheds have integrated watershed management plans: Rio de Flag, which has the majority of the Flagstaff urbanized area within it; the Verde River; and Oak Creek. The Verde River and Oak Creek watersheds are connected to the southwest portion of the Region and pass through Sedona and the Verde Valley into the Wild and Scenic River portion of the upper Verde River. Each watershed plan is organized around partnerships for watershed restoration and protection across jurisdictional boundaries.

Most streams and waterways in these subbasins are [ephemeral](#) or [intermittent](#), meaning they only have water during spring runoff and summer monsoon events, unless they are supplied by [reclaimed water](#) or springs. The geology of the Region allows for springs, seeps, and [ciénegas](#) to exist across the landscape, which benefits people, wildlife, and vegetative diversity. Many of these natural water features form along hillslopes such as Observatory Mesa, and only a portion of them are mapped. Most perennial springs are located below the Mogollon Rim south of Flagstaff though they are charged by the aquifers that flow beneath the Region. There are also manmade lakes and ponds; for example, Lake Mary was constructed to support the City's municipal water supply, while Francis Short Pond was built in the early 1920s following significant flooding.<sup>2</sup> It is estimated that 85 percent of wildlife species in Arizona depend on these intermittent and manmade wetlands at some point in their life cycle. The network of manmade lakes and wetlands on Anderson Mesa and the Picture Canyon section of the Rio de Flag are both perennial water sources that are critical for wildlife. The Anderson Mesa wetland complex, for example, has been designated as an Audubon Society Important Bird Area (IBA). Recognizing the importance of water sources for wildlife, the City and AZGFD entered into an agreement to provide water for the I-40 wetlands, Picture Canyon, and Francis Short Pond. In addition to these sites, the Region has riparian areas (stream channels dominated by native willows, box-elder maples, cottonwoods, native water-loving grasses and forbs) that have not been comprehensively mapped but are enjoyed by people and the native amphibians, reptiles, birds, and mammals that depend on these plants.

With expected changes to the Region's climate, the impacts of prolonged drought, more frequent and severe wildfires, and the ways in which seasonal and wildfire-related flooding will affect watersheds are pressing concerns. Shorter duration, higher-intensity precipitation events can cause increased flooding with or without fire impacts.

During 2022, the Region experienced more than 45 major flood events, many in watersheds that had recently experienced wildland fires.<sup>3</sup> The 2022-2023 snowpack also created flooding during the spring melt. Multiple agencies manage flooding response and recovery in the Region: the Stormwater section of the City's Water Services division, Public Works, Emergency Management, and Planning and Development Services divisions, and the County through its Flood Control District, Engineering, and Community Development departments (see [Chapter 9, Water Resource Management](#) and [Chapter 11, Infrastructure and Public Safety](#) for more information).



**Watersheds**

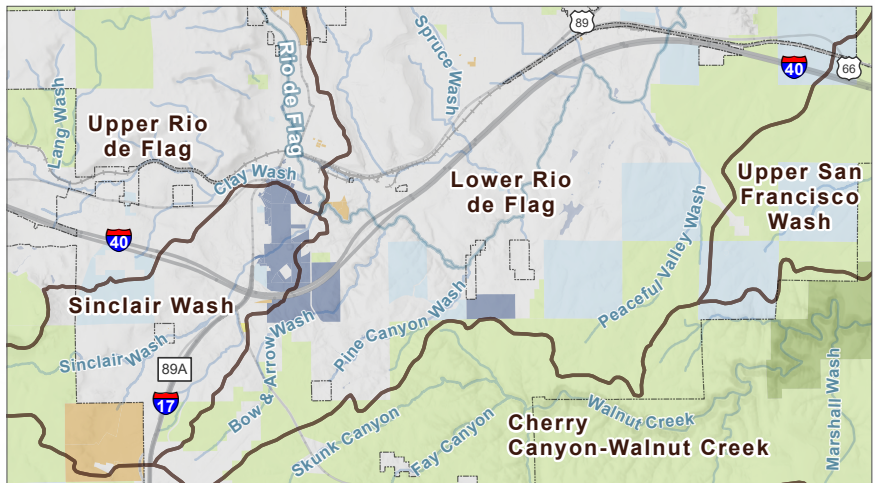
Watersheds

**Water Courses**

- Rio de Flag and San Francisco Wash
- Tributaries

**Land Managing Agency**

- Arizona Game and Fish
- National Forest
- National Monuments
- State Lands
- Arizona Board of Regents (NAU)
- Coconino County
- Navajo Army Depot and Camp Navajo



Esri, NASA, NGA, USGS

Information Map 7-1: Watersheds and Waterways of the Region

## Land and Biodiversity


Land is a foundational element of the natural system that determines the availability of resources and the biodiversity of the Region. It is also foundational for the systems on which human communities are built. Soils and geology within the Region are diverse and unique due to the variety of rock types, geological processes, and interacting geomorphic systems. Sedimentary rock layers, like those seen in the Grand Canyon, subjected to [karst activity](#) and volcanic and tectonic events—like those that formed the San Francisco Peaks—create the biodiversity and dramatic landscape that have long supported human habitation of the Colorado Plateau.

The landscape of the City and County is iconic as demonstrated by the three National Monuments within the Region and the national parks that surround it. The viewsheds associated with the San Francisco Peaks, Mt. Elden, and the National Monuments are important cultural centers for the Region and are a considerable asset to the quality of life for all. Protecting the [viewsheds](#) on the Region's federal land is part of the management plans for the Region's national forests and parks. On private land, the City and County have limited ability to protect viewsheds but encourage that they be considered carefully in site planning and in public projects. Viewshed management on City, state, and private land is primarily a consideration of parks and [open spaces](#) and their design (see [Chapter 3, Goals and Policies](#) for related goals and policies).

The Region's forests, grasslands, wetlands, and other [ecosystems](#) support a diverse array of plant and wildlife species. The Region is part of the largest contiguous Ponderosa pine ecosystem in the world. This ecosystem has been heavily impacted by the fire suppression and logging strategies of the last century, and other developments. Woodlands and grasslands provide habitat for rare plants and forage for wildlife. These flora are particularly vulnerable to [climate change](#), and many are important to preserving and maintaining indigenous cultural practices.



Lockett Meadow



In all of these ecosystems, non-native plants change the availability of food and elevate the fire risks to wildlife and humans. Invasive exotic species of plants can dramatically reduce the abundance and ecological roles of native species. It is unrealistic and undesirable for the Region to become a fully wild area and retain all native species. Bears, for instance, would not be welcome in Bushmaster Park. It is also unrealistic to eliminate all non-native species, such as red-hot pokers and Japanese honeysuckle, which are common ornamentals in gardens and parks. However, efforts to eliminate priority invasive plants, such as Scotch thistle, Siberian elms, cheatgrass, and knapweed, would improve the Region's natural areas and mitigate the wildfire risks.

Changing climate conditions can exacerbate the loss of plant species and their diversity within the Region's ecosystems. It can also exacerbate the introduction and spread of invasive species. The species' composition and abundance, and the overall ecosystem health of the Region, are an asset to wildlife conservation, tourism, fire protection, and quality of life.

The City has a Resource Protection Overlay, last updated in 2011, that prioritizes floodplains, trees, and steep slope preservation. While the Overlay's requirements have been successful in preserving the natural appearance of land within the City, they have also had unintentional consequences of preventing densities that would address the housing shortage and preserving trees located within the ignition zone of buildings. They have inadvertently increased wildfire risk because of the higher density of trees within neighborhoods by promoting a pattern of trees that is not consistent with the natural forest structure and pattern. Private lands adjacent to National Forest System lands are particularly problematic where higher tree densities and a landscape designed to carry fire naturally encounter properties that are not prepared and maintained for fire protection.

At the landscape scale, the connection between habitat resources that allow wildlife to thrive is vital given the impacts that [climate change](#) may have on the location and abundance of water, food, shelter, and their ability to reproduce. Wildlife linkage areas in the County were identified during a multiagency effort in 2011 led by AZGFD. Different species of wildlife use these areas seasonally during migrations and dispersal movements to find food, water, and mates, and to reduce genetic isolation of populations.<sup>4</sup> When animal species from different populations are allowed to mix, they exchange genes. This makes the populations of the species more resilient to environmental changes and catastrophic events. Habitat conservation that supports dispersal and migration of wildlife within these linkage zones will help wildlife adapt to habitat changes that result from climate change and maintain the biodiversity of the Region.

Not every undeveloped parcel of land is equally important in habitat and species conservation efforts. The [habitat linkages data](#) provides a broad data source for identifying areas that may be important for migration and dispersal.

## Cultural Resources

The pre-history habitation of the Colorado Plateau landscape is evident in the presence of Indigenous people today and the sites that remain from the presence of their ancestors. The recordation, curation, and conservation of the sites and artifacts that tell the story of the Region's Indigenous people and urban history are a cultural, economic, and educational resource protected by federal, state, and local regulations. The City is a Certified Local Government under the National Historic Preservation Act, which makes the City eligible for specialized assistance and funds for developing its own local preservation programs. The City's Zoning Code has a process that ensures the proper curation and documentation of [cultural resources](#) that are found during the development review and permitting process. The City also offers technical assistance to property owners and coordinates with state and federal agencies on projects that may impact cultural resources. The [Coconino County Comprehensive Plan](#) goals and policies support cultural and historic resource protection, and the County may seek to achieve Certified Local Government status.

## Significant Natural Resources (Policies DP.5, RS.5, and OS.2)

“Significant natural resources” refers to natural resources and features that are important to the ecosystem because of their ecological role, scientific or habitat value, and/or uniqueness. Significant natural resources may contribute to maintaining healthy watersheds and healthy native plant communities, decreasing erosion and fire risk, and supporting wildlife, especially sensitive species. Per [A.R.S. § 9-461.05](#), the Regional Plan may include “policies and implementation strategies that are designed to ... conserve significant natural resources and open space areas in the growth area and coordinate their location to similar areas outside the growth area’s boundaries.”

Across Urban, Suburban, Rural, and Employment areas in the Region, the preferred approach to resource conservation is to identify and preserve areas of concentrated resources to support functional ecosystems. These high-value areas for conservation should be aligned with the locations of parks and [open space](#), or civic space in development plans per Regional Plan Policies RS.5 and OS.2. Policy DP.5 goes further than what is required by the State by encouraging [greenfield development](#) to provide [nature-based solutions for infrastructure](#). [Guidelines in Chapter 4](#) also encourage that greenfield development be clustered to keep significant natural resource areas intact.

The Significant Natural Resources and Conditions maps ([Information Maps 7-2](#) and [7-3](#)) provide information to consider when evaluating property for development or when drafting development proposals based on data that is reliable and available at the Regional level. Some significant natural resources lack reliable spatial data and are not mapped but should be included in updates to resource survey requirements and considered in discretionary rezoning cases on applicable properties to the extent that can be done so legally. Voluntary conservation is highly encouraged and supported throughout the Region as part of the community culture and values. Best Practices for the Conservation of Significant Natural Resources are found in [Chapter 3, Goals and Policies](#).

Maps in this chapter are to be used to inform decisions and as references to the appropriate data for future projects and efforts. When referencing maps in this chapter, more site-specific data should be collected and verified by the appropriate resource professionals.

### Mapped Resources

#### *Geologic Faults*

The Region lies within the seismically active Northern Arizona Seismic Belt. On average, the community feels one earthquake per year. The occurrence of past earthquakes indicates that a magnitude 6.0 or larger earthquake could occur. For local technical information, consult the [Arizona Earthquake Information Center](#).

#### *Audubon Bird Sanctuaries and Other Bird Habitat*

Within the project area, the local chapter of the Audubon Society recognizes two different categories of bird habitat areas. The Anderson Mesa IBA has been documented as one of two major waterfowl use areas in Arizona during migration. Although a severe drought has continued for the last several years, the natural wetland system within this IBA provides excellent habitat for waterfowl, water birds, and wading birds during years when sufficient moisture occurs during the winter. The local chapter of the Audubon Society has also recognized other smaller areas as regionally important bird habitats and exceptional bird watching. These sites have one or more of the following attributes: a regionally high number of birds; a regionally high diversity of bird species; and/or one or more regionally noteworthy species regularly or seasonally present.

#### *Steep Slopes and Rocky Outcroppings*

Natural topography refers to the surface of land (such as a lot, tract, or parcel) before any grading, excavation, or other preparation occurs. It protects developed areas from flooding and erosion. It has an attractive, harmonious appearance and is critical in supporting healthy plant and animal communities including wildlife linkages. Modification of steep slopes alters the drainage pattern of the land in unpredictable ways that can result in flooding and other property damage. Removing vegetation from slopes leads to soil instability and undesirable changes in the soil’s chemical and physical properties. Plant and animal communities are very different on south-facing slopes compared to north-facing slopes. Therefore, conserving topography conserves biodiversity.



### *Riparian Areas, including Springs, Seeps, Wetlands, and Alluvial Soils*

Riparian areas sustain a biodiversity of plants and animals, and many riparian areas coincide with floodplains. Floodplains are areas subject to seasonal flooding. Springs and seeps occur where groundwater discharges to the surface and may be [ephemeral](#) or perennial. They support important habitats and serve as a water source for wildlife. Conservation of watersheds is essential to securing a safe and adequate water supply for the community. Healthy watersheds allow both infiltration of rain and snowmelt and a functioning system for seasonal runoff. Riparian areas are rare and vital habitats for unique plants and animals. They are critical to the survival of resident and surrounding invertebrates, amphibians, birds and mammals, and serve as wildlife linkages. They help filter water, recharge the aquifer, and reduce flooding, runoff, and erosion.

### *Wildlife Corridors*

Wild animals use wildlife corridors when traveling from one habitat to another on a seasonal or more frequent basis. Corridors ensure thriving wildlife populations through ecological functions including gene flow, predator-prey interactions, and migration. Corridors provide an exciting connection to nature for residents and visitors alike. Wildlife corridors are delineated by the [AZGFD Wildlife Linkages data](#). The agency also offers tools for conserving wildlife connectivity including [Wildlife Friendly Fencing Guidelines](#). Where wildlife-human conflicts exist, for example elk damaging property or causing vehicle collisions, wildlife corridors can sometimes be adjusted by developing suitable habitat and/or installing fencing so animals bypass problem areas during their travels.

### **Unmapped Resources**

#### *Gunnison's Prairie Dog Colonies*

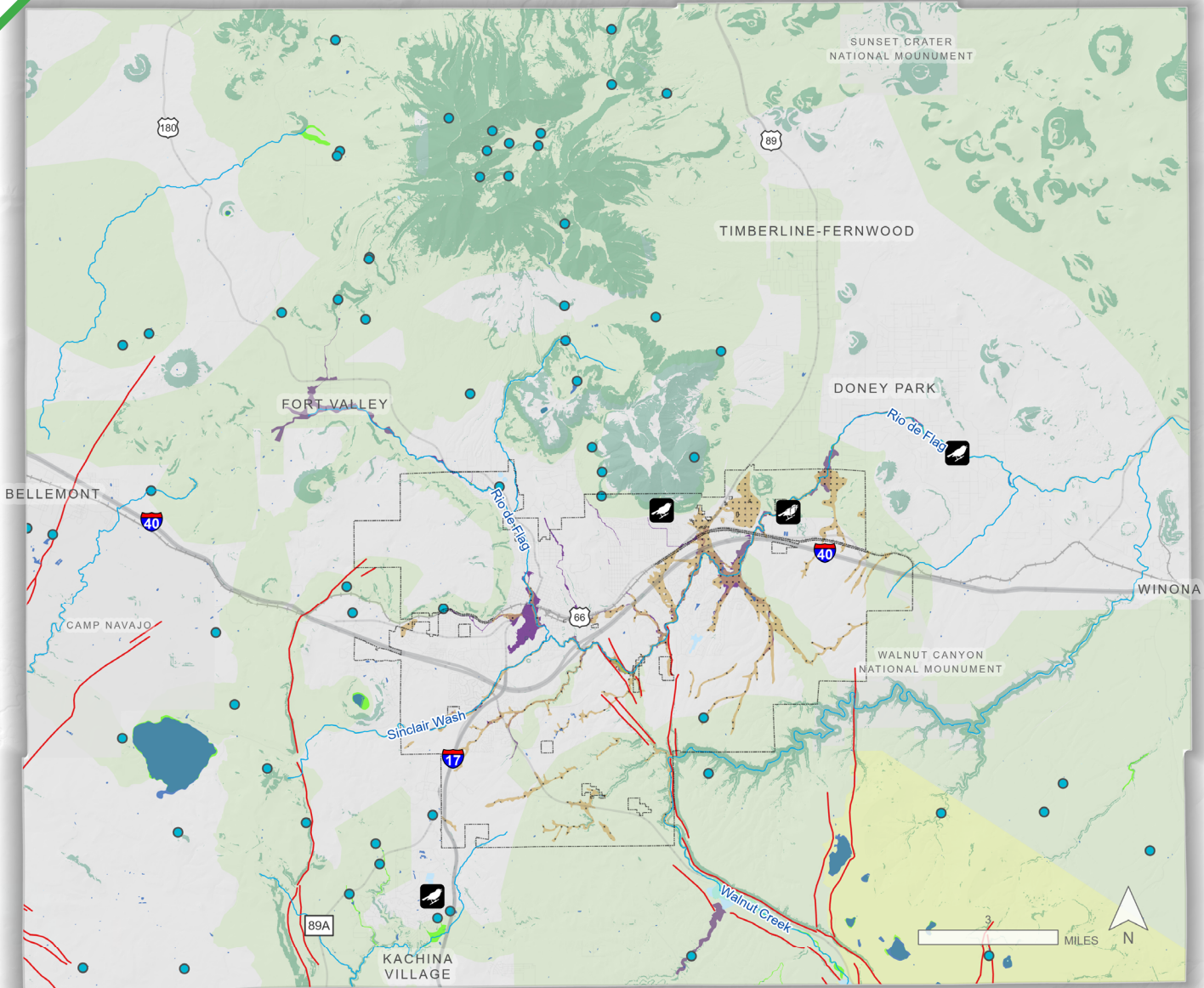
Gunnison's prairie dogs form colonies of burrows in local grasslands. Prairie dogs are considered a grassland keystone species because they provide food, shelter, and habitat for many other animals and plants. They are a Species of Greatest Conservation Need in Arizona's [State Wildlife Action Plan](#). They tend to occur in open meadows or disturbed areas with deep soil. Several colonies exist within the greater Flagstaff area including Country Club, the Rio de Flag near Foxglenn, Doney Park, Fort Valley, and even in medians along Route 66.














#### *Large Stands of Ponderosa Pines*

The natural structure of a healthy Ponderosa pine forest consists of clusters of trees surrounded by open grassy areas. Historically, old Ponderosa pines were preserved by frequent fire and spacing of tree clusters. Maintaining or restoring natural forest structure results in healthy plant and animal communities and reduces the risk of fire or disease. Fire treatments and vegetation management in the [wildland urban interface \(WUI\)](#) are considerations in areas with Ponderosa pine stands.

#### *Rare Plants*

Rare or unique plant communities often occur on a specific soil type and/or topography. Priority plants and soils for conservation include Rusby's milkvetch, Sunset Crater Beardtongue, and rare plants associated with dacite and limestone soils. Many rare plants are associated with steep slopes, and they are oriented on grassy openings such as subalpine or montane grasslands. Rare plants play an important role in sustaining biodiversity by serving as hosts and nectar sources for invertebrates and birds.

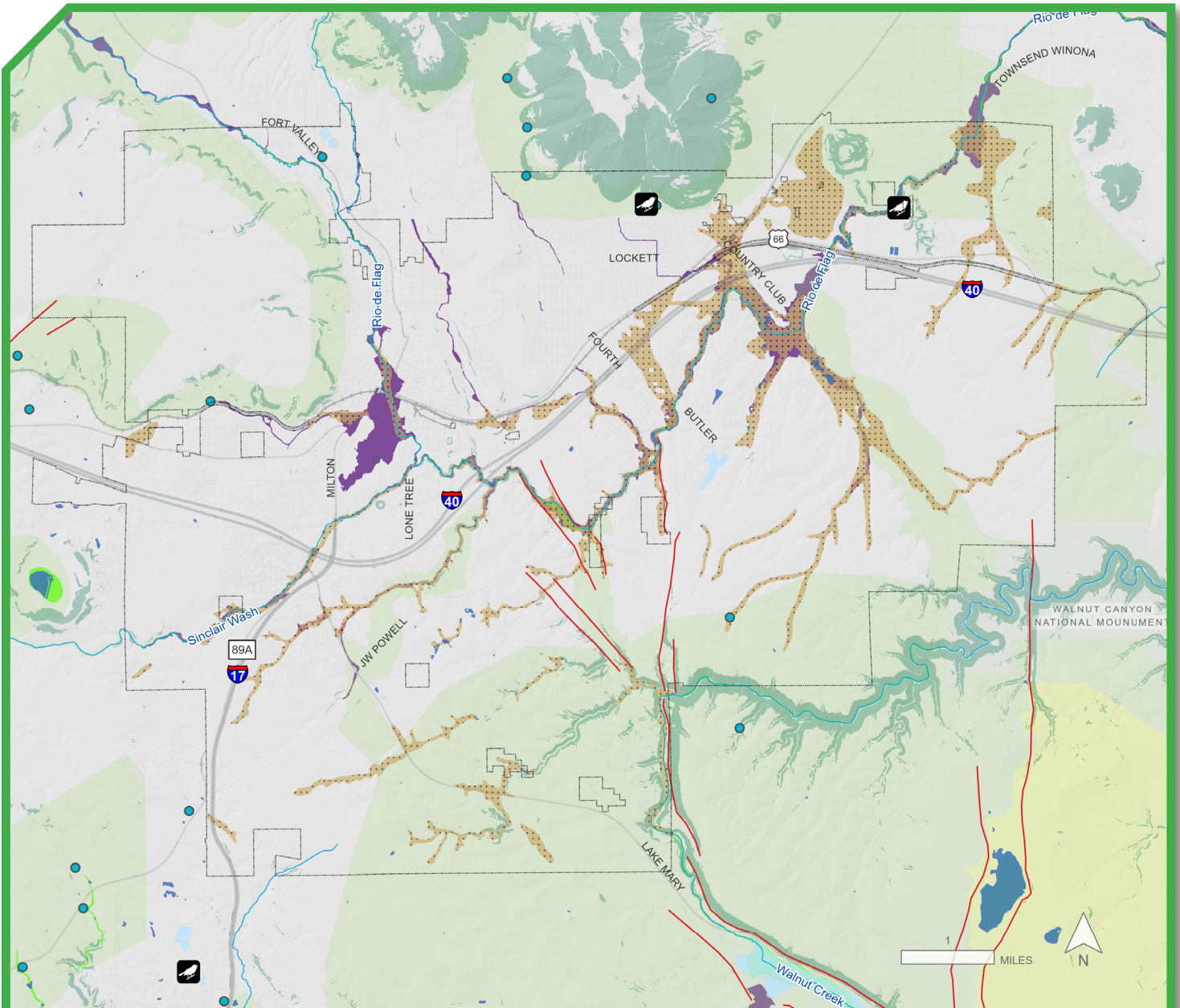















-  Audubon Sanctuaries and Other Bird Habitat
-  Anderson Mesa IBA
-  Alluvial Soils
-  Riparian Vegetation
-  Steep Slopes (35% or greater)
-  Wildlife Corridor
-  Springs
-  Ephemeral Streams
-  Lake or Pond
-  Reservoir
-  100 Year Floodplain
-  Faults
-  CoF Boundary



Information Map 7-2: Significant Natural Resources – Regional Scale

Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community



- |  |   |
|--|---|
|  Audubon Sanctuaries and Other Bird Habitat |  Springs             |
|  Anderson Mesa IBA                          |  Ephemeral Streams   |
|  Alluvial Soils                             |  Lake or Pond        |
|  Riparian Vegetation                        |  Reservoir           |
|  Steep Slopes (35% or greater)              |  100 Year Floodplain |
|  Wildlife Corridor                          |  Faults              |
|  |  CoF Boundary        |



Information Map 7-3: Significant Natural Resources – City Scale

Airbus, USGS, NGA, NASA, CGIAR, NCEAS, NLS, OS, NMA, Geodastystrelsen, GSA, GSI and the GIS User Community

## Action Items

High Priority Action Items. See [Appendix C](#) for additional information.

Type of Action	Item	Timing
Partner/Fund	Coordinate invasive plant plans, programs, and resources with regional, state, tribal, and federal partners focusing on the Arizona Department of Forestry and Fire Management Invasive Plants of Concern, the University of Arizona's Cooperative Extension, and those identified by the City Fire Departments and Local Fire Districts because of their impact on fire risk throughout the Region.	Mid term
Partner/Fund	Engage in ongoing coordination of projects, funding opportunities, and policies identified in area Watershed Management Plans, such as the <a href="#">Rio de Flag, Oak Creek</a> , and <a href="#">Upper Verde River Watershed</a> plans.	Continuous
Code	Update and refine the City of Flagstaff's Resource Protection Overlay and landscaping regulations to incorporate updated urban forestry best practices, conform with the best practices of Fire-Adapted Communities, and calibrate and prioritize natural resources.	Short term

Other Action Items: While important, these projects may be prioritized as opportunities and funding arise.

Type of Action	Item	Timing
Plan/Fund	Create a Historic Preservation Action Plan for the City that supports the management and <a href="#">adaptive reuse</a> of historic public buildings and strategies to support private preservation efforts better.	Mid term
Fund/Partner	Create a program, funding, and partnerships to assist when the demolition or removal of a historic structure cannot be avoided; encourage the developer to make the structure available for relocation, and assist with moving it to the purchaser's property, if possible.	Long term
Fund	The County will continue to seek resources and support to create cultural and historic resource inventories, and to become a Certified Local Government.	Long term
Partner	In cooperation with other agencies and non-governmental organizations, actively locate, identify, interpret, and preserve historical, archaeological, and <a href="#">cultural resources</a> as aspects of the society for future generations to retain, understand, and enjoy their cultural identity.	Continuous
Partner	Encourage the development of historic overlay zones and creation of design guidelines for additional historic districts.	Continuous
Plan	Engage residents proactively at the neighborhood level in the development and implementation of natural and cultural resources projects and programs to ensure recognition and integration of diverse cultural histories, traditions, and contributions.	Continuous
Partner	Build partnerships to support the best practices for the conservation of <a href="#">significant natural resources</a> and improve the available data that can support land use decisions.	Continuous
Plan	Address cultural competency in natural resource management through the implementation of Resource Stewardship and Resilience and Cultural Resources policies.	Continuous
Partner	Actively collaborate with Indigenous leaders to co-create natural and cultural resource projects that respect tribal sovereignty, traditions, and ecological expertise.	Continuous

## Chapter 7 Endnotes

1. CLIMAS, *Climate Profile*, 2018.
2. Whether Francis Short Pond was constructed for stormwater or recreational purposes is debated, although an on-site sign reads that it was built for retention.
3. Sarbak, "Wildfire burn scars and flash flooding," 2023.
4. AZGFD, *Coconino County Wildlife Connectivity Assessment*, 2011.



Fort Valley, Source: Bob Short

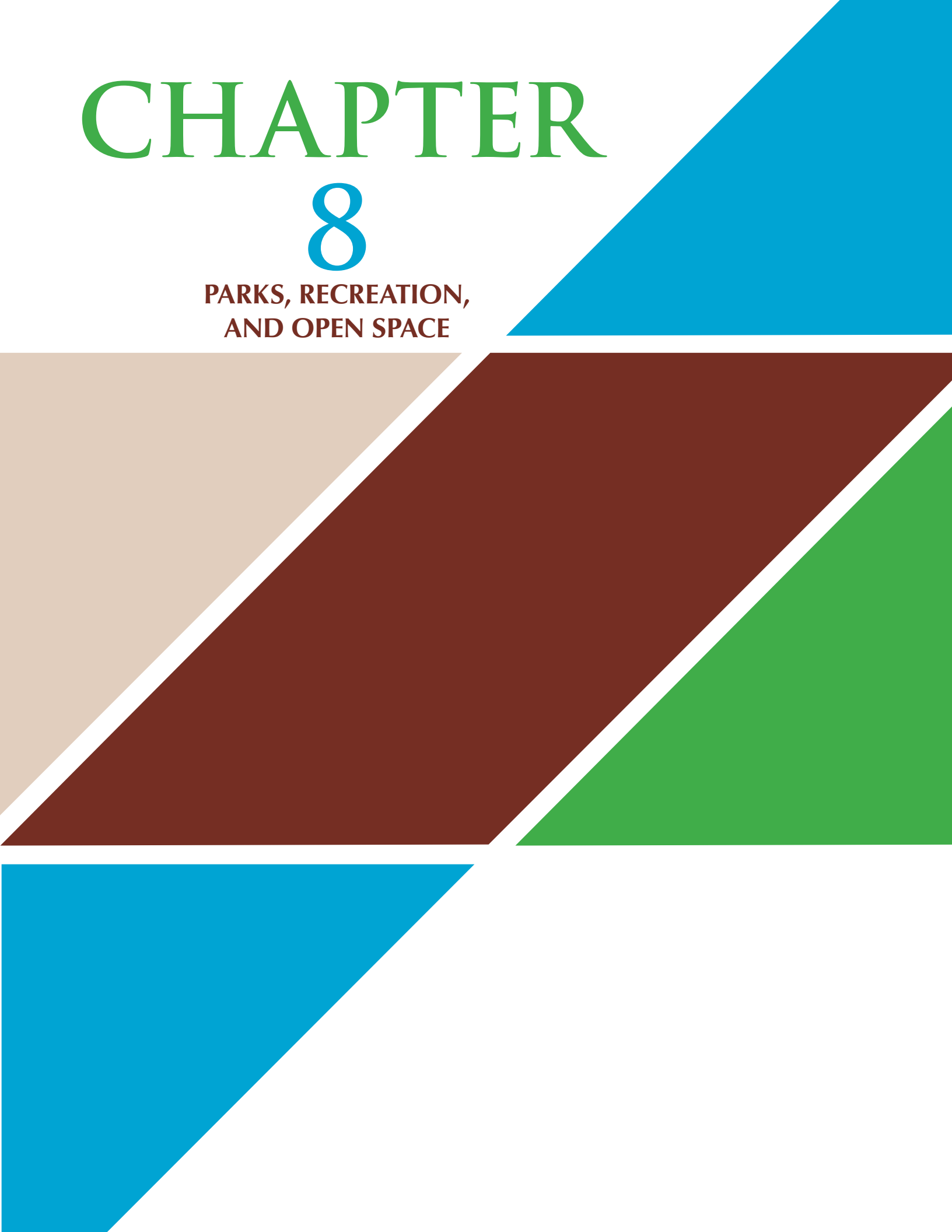


*Pedestrian Bridge across Cedar Avenue*

# CHAPTER

# 8

PARKS, RECREATION,  
AND OPEN SPACE





Anonymous, Community Event 2022

# PARKS, RECREATION, AND OPEN SPACE

## BACKGROUND

The Region contains parks, recreation centers, [open spaces](#), and trail systems that support community health, embody an abundance of natural and [cultural resources](#), and offer a wide variety of outdoor activities. The Region is home to three National Monuments and 240,892 acres (376.4 square miles) of National Forest; 30 City and County parks; four recreation centers; more than 3,000 acres of City-managed open space; and nearly 2,670 acres of County-managed open space.

The Historic Route 66 All-American Road divides the Region east to west, while the Arizona National Scenic Trail crosses through it north to south. These landmark routes are assets for residents and visitors, providing connectivity to outdoor recreation and opportunities to enjoy the Region’s cultural and natural settings.

The City operates the Flagstaff Aquaplex, Hal Jensen Recreation Center, Jay Lively Activity Center, and Joe C. Montoya Community and Senior Center and leases two properties for non-profit-run activity centers: the Boys and Girls Clubs of Flagstaff (formerly Cogdill Community Center) and the Murdoch Community Center.

The County manages 675 acres of park land within the Region including Elizabeth “Liz” C. Archuleta County Park, Fort Tuthill County Park, Peaks View County Park, and Raymond County Park. Through an agreement with the Coconino Natural Resource Conservation District, the County provides a facility to the Willow Bend Environmental Education Center at Elizabeth “Liz” C. Archuleta County Park. The Region is home to the County Fairgrounds at Fort Tuthill County Park, which hosts more than 60 events annually including concerts at the 3,200-capacity amphitheater, rodeos, races, festivals, and more.

This blend of public and non-profit management strategies provides the community with valuable indoor and outdoor amenities that offer a diverse array of recreational, educational, health, and social services. The Arboretum at Flagstaff is a botanical garden that provides an outdoor museum and educational opportunities.



Cheshire Park

Parks and [open space](#) access is essential to safe and livable neighborhoods. Parks and open space contribute to [sustainability](#), human and environmental health, and provide [nature-based infrastructure](#) such as stormwater management and diffusion of urban heat impacts. [Equitable](#) access to parks considers both the proximity and quality of the outdoor and indoor opportunities that these spaces provide. The creation and maintenance of strong park systems that are infused with vibrancy and connected to nature can encourage economic prosperity, particularly in neighborhoods which might have higher vacancy rates and a less-stable affordable housing stock.<sup>1</sup> Parks and open space can also be sited to preserve important historical and [cultural resources](#) as well as open spaces that protect [significant natural resources](#). As new neighborhoods are developed and existing neighborhoods experience [infill](#) development, parks and open spaces should continue to experience equitable investment so they can be maintained as well-designed, participatory, community assets.

**Gardens** encourage active participation in park activities and promote the value of outdoor community gathering places. Community gardens support sustainable food systems, food security and [resilient](#) neighborhoods by providing plots of land for the public to grow fruits, vegetables, and herbs. They also transform park and vacant land into community-managed green spaces and support agricultural education. Community gardens can also be co-located with affordable housing sites. The Community Garden at the Hal Jenson Recreation Center is close to several affordable housing communities run by Housing Solutions of Northern Arizona. Community farms are larger scale community gardens that are focused on food production and selling food to community members or a non-profit organization. Volunteers also tend to demonstration gardens on City and County properties, which provide a specific educational purpose such as teaching the benefits of xeriscaping or growing native plants (see [Chapter 5, Social and Economic Systems](#), for further discussion of urban farming and agriculture).



*Multiple City and County locations host community and demonstration gardens.*



## FUTURE PARKS AND OPEN SPACE

As the community grows, the need for new parks, designated [open spaces](#), and [accessible](#) and [inclusive](#) recreation and event venues is an essential consideration. The County completed the [Coconino County Parks & Recreation Master Plan](#) in 2019, and the City will soon be preparing a new master plan for parks, recreation, open spaces, and community events. These types of master plans identify opportunities and unmet community needs for adding new recreational infrastructure such as playing fields and educational and cultural centers; purchasing additional open space; and expanding trails and greenway connectivity. They also examine how to improve the services that parks provide, and how the City and County can modify resources as recreational preferences change and as aging facilities need repair or replacement.

The City is working to reimagine existing buildings and land within parks, or in areas with an identified park need, and pursuing opportunities to designate new community parks and expand access to existing parks and recreational opportunities. For example, the City is looking to rehabilitate the former fleet building in Thorpe Park into a an Indigenous Community Cultural Center.

The City is holding other land it owns for future-designated parks. The Five-Year [CIP](#) includes funding for girls' softball fields at the largely undeveloped Continental Park and a multipurpose field at Cheshire Park. Other identified but unfunded park needs include a new or expanded regional park and/or open space in southwest Flagstaff; additional open space south of I-40; infill parks such as those noted in the *Southside Neighborhood Specific Plan*; and playing fields in the Clay Avenue Wash area on West Route 66. [Policy Map 3-1](#) indicates future park improvements that are part of the City's 10-Year CIP and those that are aspirational in the next 20 to 30 years.

The regional trail system (see [Policy Maps 4-5](#) and [4-6](#)) is the backbone to improve access to parks and open spaces. Trails within green spaces help protect wildlife corridors and habitats, historic and cultural areas, and [viewsheds](#) (see [Chapter 6, Transportation](#)). Providing access to parks, open spaces, trails, and green spaces of all kinds is an area of identified need. The wildlife linkages identified in [Chapter 7, Resource Stewardship and Resilience](#), are key locations for open-space preservation. Areas of denser [cultural resources](#) and pre-Western settlements, such as Elden Pueblo, Picture Canyon, and Walnut Canyon, encompass important resources that have been preserved by open space planning and acquisition. Securing new open space, expanding trails, and acquiring park lands are vital to maintaining diverse recreational opportunities for residents and visitors alike, as well as supporting public health and preserving the Region's invaluable natural and cultural resources.

In the 2019 [Coconino County Parks & Recreation Master Plan](#), most communities in the County identified trails, trail interconnectivity, and greenways as prominent themes, with specific emphases on the need to create county-wide connectivity to parks, open spaces, and recreation. The County plan identifies the two most important needs in the next five to 10 years as Open Space/Natural Areas and Trails & Greenways. It also identifies specific priorities and opportunities for communities throughout the county. For example:

- » **In Bellemont**, priorities include improved trail maintenance, ADA accessible parking at trailheads, trail wayfinding signage, an outdoor amphitheater for community events, and an urban trail system plan.
- » **In Doney Park and Timberline**, the highest overall priority is access to trails and greenways, followed by community events, active adult/senior programs, and fitness/wellness programs.
- » **In the Flagstaff area**, the highest overall priority is access to trails and greenways, with trail development and connectivity listed as a specific priority. Other priorities include more community events, outdoor recreation, and natural/cultural and historical programs.
- » **In the Kachina Village/Mountaineer area**, top priorities include access to trails and greenways. A [FUTS](#) extension to Kachina Village and access to the National Forest in Mountaineer are listed as specific priorities, as well as water access, preservation of open space, more community events for outdoor recreation, and natural/cultural or historical programs.

## Action Items

High Priority Action Items. See [Appendix C](#) for additional information.

Type of Action	Item	Timing
Fund	Leverage available funding to negotiate for the purchase of greenfield lands for parks, <a href="#">open space</a> , and trails in the JW Powell Boulevard extension area. (City only)	Midterm
Fund	Consider pursuing a County and/or City bond or finance mechanism to fund regional park, recreation, and open space initiatives, operations, and maintenance.	Midterm
Partner	Engage with the Arizona State Land Department (ASLD) to create opportunities for future development and open-space preservation, with a particular emphasis on the <a href="#">JLUS</a> findings.	Short term

Other Action Items: While important, these projects may be prioritized as opportunities and funding arise.

Type of Action	Item	Timing
Plan	Update the City's <i>Parks, Recreation, Open Space and Events Master Plan</i> . During this process, bring forward and build on the concepts of neighborhood open space, priority open space areas, and coordination and connectivity among all agencies in the management of open space and greenways from the <i>Flagstaff Area Open Spaces and Greenways Plan</i> , as an interagency guide for the preservation of open space.	Short term
Plan	Implement priorities from the <a href="#">Management Plan for Legally Designated Open Space</a> (2020) or updates to this document and area-specific open space plans.	Continuous
Partner	Work jointly and independently to identify key parcels of land and priorities to acquire for open space based on criteria established in the Regional Plan and by the appropriate City and County Commissions.	Long term
Partner	Create partnerships for construction of new <a href="#">active recreational</a> facilities and seek grant funding to leverage local public funds.	Long Term
Fund	Evaluate the potential for Parks and Recreation impact fees during the next review of the City's impact fee schedule. (City only)	Midterm
Plan	Maintain an up-to-date, GIS-based inventory of open space system lands, monitor those resources, and use the data to refine the City and County management practices and requirements as they pertain to cross-departmental open space management.	Continuous
Partner	Support opportunities for public-private partnerships for parks and open spaces to provide equitable outdoor environmental education, STEM activities, and public health education and activities for the Region.	Continuous
Partner	Support changes to state law that provide greater involvement and management by local and county government in the disposition of State Lands.	Long term
Partner	Coordinate the management and designation of public open spaces and corridors, and private land under conservation easements, with the AZGFD, the US Department of Agriculture (USDA) Forest Service, ASLD, and other landowners to allow for greenways and wildlife corridors.	Continuous

## Chapter 8 Endnotes

1. Urban Institute, *Investing in Equitable Urban Park Systems*, 2019.