

Transportation Element

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Photo by Gregory Richards



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Introduction

The Transportation Plan is designed to achieve a balanced reliance on multiple transportation modes: single-occupant vehicles, multi-occupant vehicles, public transit, bicycling, and walking. This balance will enable the Flagstaff metropolitan area to attain high levels of mobility and accessibility while preserving community character and quality of life. The Transportation Plan includes a Roadway System Plan, a Transit System Plan, and Non-Motorized Systems Plans for trails and bikeways.

The Transportation Element of the *Regional Plan* can be summed up in five words: *safety*, *balance*, *connectivity*, *efficiency* and *diversity*. “Safety” is the first concern. It is reflected in the goals and policies related to traffic calming. “Balance” is the mix of transportation modes, choices, and road facilities we want to make available. Transit, bicycles, and pedestrians are prominently featured in the policy framework. “Connectivity” creates resilience, choices, and opportunities across and beyond the region not afforded by the existing system. The *Regional Plan* recognizes deficiencies in the road system, and consequently the bike and pedestrian systems, and the plan maps clearly show where we will make corrections. “Efficiency” is the quality of performance achieved at each intersection and across the system. Signal synchronization and intersection improvements will help to achieve this end. “Diversity” recognizes the full array of transportation needs for our economy, our visitors, and residents. It is a quality of life issue as much as anything. Truck routes, the railroad, and the references to transportation in most of the plan elements support the diversity of the system.

The Transportation element includes several systems maps: a Roadway System Plan (Map 8), a Transit System Plan (Map 9), and Non-Motorized System Plans for trails and bikeways: Bikeways Plan (Map 12) and FUTS (Map 13). It also includes two administrative maps: Truck Route Plan (Map 11) and Roadway Categorization Plan (Map 10). These maps describe the locations of existing and future facility locations needed to support the land use and economy-related plan elements.

The Truck Routes map positively identifies where trucks are to operate for cross and through-town trips. The *Regional Plan* policies direct the City and County to develop regulations for specifying how trucks may make deliveries (i.e., make use of the shortest route in and out of a residential area, during certain hours in certain zones). The map will guide investment and design decisions so that trucks may operate in the Flagstaff region safely and efficiently.

The Roadway Categorization Plan (RCP) map is a further delineation of the Roadway System Plan. The System Plan defines major roadways. The RCP distinguishes major arterials from minor arterials and goes further to denote minor collectors, commercial local streets and a special category of street called a connector. Four roadway categories in the RCP system are not mapped for purposes of clarity: Residential local streets, Narrow residential local streets, Connector streets, and Alleys. Connectors are more often local streets that need to be built to allow low-speed, non-through trip connections between neighborhoods. The RCP will be the basis for guiding design decisions, traffic calming implementation, and landscaping, among other things.

In establishing the criteria for category designation, special attention was given to the role different types of roads play in defining the region's role in the state, the district's role in the region, and the neighborhood's role in the district. Similarly, transportation is interwoven throughout all of the *Regional Plan* elements. This will help in remembering that transportation is a means to an end—a higher quality of life, and not an end in itself.

GOAL T1

A safe, convenient, user-friendly transportation system will be developed throughout the region, addressing both short- and long-term needs, and emphasizing alternative transportation modes while reducing dependency on the automobile.

Rationale

Similar to other cities and regions throughout the United States, the automobile is the dominant mode of transportation in the Flagstaff region. However, the continued reliance on the automobile to meet the growing transportation needs of a growing region is likely to degrade air quality levels; increase unacceptable traffic congestion and driving times; negatively impact neighborhoods; require widening of roads and other expensive infrastructure improvements; and consume land that could be used to provide jobs, housing, or open space. The quality of life for the region’s residents would deteriorate if they had to rely primarily on the automobile to travel locally or regionally. Therefore, the *Regional Plan* encourages an efficient and balanced transportation system that ensures local and regional connectivity and neighborhood integration, while at the same time offers viable alternatives to the automobile, thereby minimizing auto dependency and unnecessary driving trips.

Implementation Matrix Key

In the “Time Frame” column, the first number indicates when the action should be initiated and the second number indicates when it should be completed relative to *Regional Plan* ratification. For example, “0–1” means the action should be initiated as soon as possible and be completed no later than within one year of *Regional Plan* ratification. These time frames are set with the understanding that they are meant as best estimates and may have to be adjusted given the numerous parties involved in implementation of any given strategy.

The following abbreviations are used throughout the matrix:

- | | |
|--|--|
| ADOT Arizona Department of Transportation | PRA Planning Reserve Area |
| CIP Capital improvement Program | RGB Rural Growth Boundary |
| FHWA Federal Highway Administration | UGB Urban Growth Boundary |
| FMPO Flagstaff Metropolitan Planning Organization | USFS United States Forest Service |

Policies and Strategies

<i>Policy</i>	<i>Strategy</i>	<i>Responsible Party</i>	<i>Time Frame/ Years</i>
<p>Policy T1.1—Develop a Balanced Transportation System</p> <p>The local transportation system shall strike a balance so that each mode of travel (single-occupant vehicle, multi-occupant auto, pedestrian, bicycle and public transit) is effectively utilized to meet local mobility choices and needs.</p>	<p>Strategy T1.1(a)—Develop Multi-modal Street Design Criteria</p> <p>Design all arterial and collector streets (new roads and major reconstruction projects) to effectively provide mobility and accessibility for pedestrians, bicyclists, and public transit vehicles as well as for private motor vehicles.</p>	<p>City, County, FMPO</p>	<p>0-2</p>

Policy	Strategy	Responsible Party	Time Frame/ Years
	<p><i>Strategy T1.1(b)—Establish Multi-modal Corridors</i></p> <p>The City and County shall identify multi-modal corridors throughout the region that will receive priority for multi-modal investments appropriate to each corridor. These corridors should create a gridded network throughout the community.</p> <p><i>Strategy T1.1(c)—Coordinate With ADOT and FHWA</i></p> <p>Coordinate policies with ADOT and FHWA to assure compatibility with <i>Regional Plan</i> objectives, including design, viewshed protection, streetscape enhancements, and noise attenuation.</p>	<p>City, County, FMPO</p> <p>City, County, ADOT, FHWA</p>	<p>0-5</p> <p>Through-out life of <i>Regional Plan</i></p>
<p>Policy T1.2—Create an Efficient Transportation System</p> <p>The City and County shall work to ensure connectivity and continuity in local roads and streets between adjacent neighborhoods, and between neighborhoods and nearby commercial areas and schools in order to minimize auto dependency, minimize unnecessary driving, especially for short trips, and achieve a better distribution of traffic across the roadway network, avoiding unnecessary congestion on collector and arterial routes.</p>	<p><i>Strategy T1.2(a)—Develop a Traffic Signal Capital Program and Management System</i></p> <p>The City shall work with ADOT to develop and implement a traffic signal improvement and traffic signal management system in the near- to mid-term.</p> <p><i>Strategy T1.2(b)—Develop Transportation Facility Design and Updated Roadway Cross Section Guidelines</i></p> <p>The City and County should develop the guidelines within two years following adoption of the <i>Regional Plan</i>. The guidelines shall cover streets, sidewalks, crosswalks, bicycle facilities, and transit facilities. Roadway design guidelines shall be tied to Roadway Planning Categorization.</p> <p><i>Strategy T1.2(c)—Develop Connectivity Guidelines</i></p> <p>The City and County shall adopt street system standards for large commercial and residential development projects providing for connectivity with streets serving adjacent land uses and providing for continuity in collector and local streets. These standards shall be implemented through the development review process to ensure development of an efficient, connected roads and streets network. The standards may include such requirements as maximum block length, minimum number of street connections per mile, or similar standards. The standards shall address streets, pedestrian facilities and bicycle facilities. The standards may allow exceptions for development projects adjacent to existing residential areas to accommodate concerns about cut-through-traffic and other traffic impacts on established neighborhoods.</p>	<p>City, County, FMPO, ADOT</p> <p>City, County, FMPO</p> <p>City & County</p>	<p>2-3</p> <p>2-3</p> <p>0-1</p>

Policy	Strategy	Responsible Party	Time Frame/ Years
<p>Policy T1.3—Establish Roadway Improvements Categories</p> <p>The <i>Regional Plan</i> shall establish the relative priorities of categories of roadway improvements for local (City and County) investment, and set local priorities for State of Arizona investments in arterial roadways through the continuing actions of the Flagstaff Metropolitan Planning Organization. The priorities shall conform to the following direction:</p> <ol style="list-style-type: none"> 1. The highest priority shall be projects that solve or improve demonstrated or anticipated safety problems, provided however, motor vehicle safety shall not be improved at the expense of reduced safety of movement by pedestrians, bicyclists, public transit or other legitimate means of travel. 2. The next highest priority shall be placed on “transportation systems management” investments that improve the flow of traffic through existing roadway facilities. These include improved signalization, access management, intersection reconstruction, intersection separations, and similar types of projects. 3. The City and County shall identify and work to resolve missing links and key connections in the urban street grid, especially for north-south movements near the city core. 4. The City and County shall take a lead role in identifying the need for, and assuring the provision of, key radial connectors and circumferential routes, including those which will ultimately be privately funded in connection with new development. While such projects shall not be a high priority for local public funding, the City and County may provide “up-front” funding for such projects to be repaid later by developers. 	<p>Strategy T1.3(a)—Develop and Adopt a Transportation Improvement Program</p> <p>The City and the County, working with the Flagstaff Metropolitan Planning Organization, shall establish a Transportation Improvement Program (TIP). The TIP shall be adopted and developed as a part of the transportation plan. The TIP identifies the transportation projects and programs (all modes) required to support the plan and preferred land use pattern. Project limits, project and program descriptions, and estimated costs shall be listed and mapped.</p>	<p>City, County, FMPO</p>	<p>Annually</p>

Policy	Strategy	Responsible Party	Time Frame/ Years
<p>5. Other criteria being equal, some additional priority may be placed on certain roadway links and connections which would enable better response times for emergency services or which would provide needed redundancy in routes for emergency access or circulation.</p>			
<p>Policy T1.4—Reduce Negative Traffic Impacts in Residential Neighborhoods</p> <p>Traffic calming shall be incorporated in neighborhoods to mitigate negative impacts, and streets serving residential areas shall be designed in a manner that does not encourage through-traffic in neighborhoods.</p>	<p><i>Strategy T1.4(a)—Develop a Traffic Mitigation Program</i></p> <p>The City and County shall develop a traffic mitigation program to be prepared by the City and County within three years following adoption of the <i>Regional Plan</i>. The Traffic Mitigation Program (TMP) shall include a catalogue of approved tools (including design templates) for mitigating traffic on neighborhood streets, including traffic calming and speed reduction measures. The TMP shall also provide a process that evaluates the indirect consequences of proposed traffic calming measures, and prioritizes traffic mitigation projects.</p>	<p>City, County, FMPO</p>	<p>0-3</p>
<p>Policy T1.5—Coordinate Regional Transportation Funding</p> <p>The City and County shall coordinate on development of a regional system of transportation funding that ensures that the costs of serving new development are not borne disproportionately by existing residents and property owners. This system shall also determine an equitable allocation of the costs of providing or improving major transportation facilities (including arterial and collector roads, regional trails and public transit systems) and shall allocate those costs accordingly through local taxing and fee systems.</p>	<p><i>Strategy T1.5(a)—Develop and Adopt Transportation Funding Mechanisms</i></p> <p>The recommended funding measures required to support the Transportation Improvement Program (including both local and federal/state sources) shall be part of the transportation plan. Specific implementation measures involving approvals by the City Council, County Board of Supervisors and ultimately the public shall be pursued aggressively following adoption of the <i>Regional Plan</i>.</p> <p><i>Strategy T1.5(b)—Pursue Mass Transit Funding</i></p> <p>The City and county shall pursue additional funding sources for public transit and associated infrastructure.</p> <p><i>Strategy T1.5(c)—Develop and Adopt Measures Requiring On-Site Improvements</i></p> <p>The City and County shall establish the responsibility of developers for on-site provisions for pedestrian, bicycle, public transit, and motor vehicle infrastructure.</p>	<p>City, County, FMPO</p> <p>City, County, FMPO</p> <p>City, County, FMPO</p>	<p>0-3</p> <p>0-5</p> <p>0-2</p>

Policy	Strategy	Responsible Party	Time Frame/ Years
<p>Policy T2.1—Coordinate a Public Transit System</p> <p>The City and County shall work together to establish a Public Transit System that includes the following elements:</p> <ol style="list-style-type: none"> 1. A consistent and reliable transportation system for the transit dependent elements of the population including elderly citizens, children, low-income families, disabled persons, and others unable or unwilling to drive. 2. A network of local routes connecting to all major employment and activity centers. 3. Activity center circulators, including a core area circulator with a high level of service linking downtown with the NAU campus and the medical/hospital complex, as well as other future circulators serving or connecting activity centers. 	<p>Strategy T2.1(a)—Implement Short-Range Transit Plan</p> <p>The Transportation Improvement Plan shall identify the transit projects and programs required for implementing the Short-Range Transit Plan.</p>	<p>City, County, FMPO</p>	<p>0-1</p>
<p>Policy T2.2—Develop a Cost-Effective and Efficient Public Transit System</p> <p>The City and County shall implement a public transit system in a manner that is cost-effective and efficient, and shall be designed to induce strong ridership response.</p>	<p>Strategy T2.2(a)—Identify Revenue Sources</p> <p>Stable revenue sources shall be identified that allow for capital planning and service development over time.</p> <p>Strategy T2.2(b)—Develop Transit System</p> <p>The transit system shall be developed incrementally, building on successes one step at a time, rather than attempting a large expansion of transit service in a short amount of time.</p>	<p>City, County, FMPO</p> <p>City, County, FMPO</p>	<p>0-5</p> <p>Throughout life of Regional Plan</p>
<p>Policy T2.3—Integrate Transit System Design</p> <p>Public Transit shall be part of a multi-modal system that maximizes travel choices and ensures that the modes work well together and are mutually supportive.</p>	<p>Strategy T2.3(a)—Integrate Multi-modal Street Design Criteria</p> <p>Integrate public transit into the design of multi-modal travel corridors.</p>	<p>City, County, FMPO</p>	<p>0-2</p>

GOAL T3

The region’s development pattern will support a diverse range of transportation choices, including transit, walking and bicycling, as well as driving.

Rationale

In general, development in the region is oriented to a street system developed to serve the automobile. Auto-oriented development patterns lend to sprawling subdivisions and strip commercial developments. This land development pattern typically is not in a form or density that supports transit, walking, or bicycling, although exceptions can be found Downtown and in older neighborhoods. In order to support a multi-modal transportation system, the region’s development patterns must change to support a balanced transportation system.

Policy	Strategy	Responsible Party	Time Frame/ Years
<p>Policy T3.1—Establish a Comprehensive Bicycling Network and Trails System</p> <p>This system shall connect all residential and commercial districts of the region, and provide direct access to schools, the NAU campus, public parks and the external recreational trail system on public lands. Advanced cyclists will largely be served by on-street facilities: bike lanes, wide shoulders, and in limited circumstances, wide curb lanes. Where no opportunities for such facilities exist, advanced cyclists may be accommodated on off-street multi-use paths. In many cases, parallel systems will be necessary to serve the utilitarian needs of basic riders. This may mean parallel paved bike paths or multi-use paths or nearby, parallel roads with lower volumes of traffic. The utilitarian trips of children cyclists—primarily trips to school—will be accommodated on signed bike routes, bike lanes on lower volume roads (i.e., minor collectors), and, where compatible with the Flagstaff Urban Trail System plan, off-street multi-use paths.</p> <p>Speed, volume, and connectivity factors, among others, will influence which types of facilities are necessary and when they must be improved to accommodate the various levels of cyclists.</p>	<p><i>Strategy T3.1(a)—Implement Transportation Improvement Program</i></p> <p>Develop pedestrian, bicycle, and trail master plans and incorporate related projects into the Transportation Improvement Program.</p>	City, County, FMPO	Annually
	<p><i>Strategy T3.1(b)—Coordinate Trail Programs with USFS Trail System</i></p> <p>The City and County shall coordinate the trail program with the Forest Service to support the policies in this <i>Regional Plan</i> and the recommendations in the <i>Greater Flagstaff Area Open Spaces and Greenways Plan</i>.</p>	City, County, USFS	Throughout life of <i>Regional Plan</i>
	<p><i>Strategy T3.1(c)—Identify Critical Bikeways Corridors</i></p> <p>Critical corridors will be identified for bikeways to establish a system that provides connectivity and mobility for bicyclists.</p>	City, County, FMPO	0-2
	<p><i>Strategy T3.1(d)—Develop Bikeways Facilities</i></p> <p>Develop bikeways facilities that serve the utilitarian needs of advanced, basic, and children bicyclists.</p>	City, County, State & FMPO	0-2
	<p><i>Strategy T3.1(e)—Develop Standards for Range of Cyclists</i></p> <p>Develop standards for the development of bikeways facilities for advanced, basic, and children cyclists.</p>	City, County, State & FMPO	0-2

<i>Policy</i>	<i>Strategy</i>	<i>Responsible Party</i>	<i>Time Frame/ Years</i>
<p>Policy T3.2—Promote Accessible, Pedestrian-Friendly Community Design</p> <p>Future commercial and residential projects in the region shall be planned and designed to ensure that sites and land uses are readily accessible to all modes—pedestrians, bicycles, public transit, and autos. Site plans shall not be approved which give auto circulation and access primacy over other modes to the extent that auto travel is favored and other means of travel are rendered difficult, unpleasant or unsafe. Future development in the region shall be planned and designed to be pedestrian-friendly, with full accommodation for safe, comfortable and convenient walking on a continuous, well-connected system of sidewalks, walkways and safe street crosswalks, all of which shall meet minimum pedestrian facility design standards, including all Americans with Disabilities Act requirements.</p>	<p><i>Strategy T3.2(a)—Adopt Accessible Community Design Standards</i></p> <p>The City and County shall establish standards for commercial and residential projects to ensure they are planned and designed to be readily accessible to all modes—pedestrians, bicycles, public transit, and autos. The standards shall establish minimum planning and design requirements for sidewalks, walkways, and crosswalks.</p>	<p>City, County, FMPO</p>	<p>2-3</p>
	<p><i>Strategy T3.2(b)—Adopt Transit-Oriented Design Standards</i></p> <p>All districts of the region that are expected to be transit-served shall be subject to criteria and standards for transit-oriented design.</p>	<p>City, County, FMPO</p>	<p>0-3</p>
	<p><i>Strategy T3.2(c)—Establish Pedestrian Districts</i></p> <p>Pedestrian districts shall be established around regional activity centers (e.g., Downtown and NAU, schools, and parks). Higher design standards for pedestrian facilities within these districts shall be established. These standards may include additional signing, special crosswalk features, and traffic controls.</p>	<p>City & County</p>	<p>2-3</p>

GOAL T4

The Region’s transportation system will be developed and managed with attention both to supply-side (e.g., new roads) and to demand-side strategies.

Rationale

As the region grows over the next two decades, it will no longer be feasible to meet all of the growing demand for vehicular travel through increased supply of roadways (building new roads, adding new lanes, etc.). To attempt to do so would be environmentally damaging, would lower quality of life for existing residents, would threaten established neighborhoods and commercial areas, and would be prohibitively expensive. Instead, the City and County, working with the Arizona Department of Transportation, the Flagstaff Metropolitan Planning Organization, and the public transit agency, should begin to implement “demand-side” programs and projects which reduce the rate of growth in demand for roadway capacity by reducing unnecessary auto dependency, by encouraging balanced utilization of the multi-modal transportation system, and by ensuring that single-occupant vehicular travel is not encouraged or supported to the detriment of other modes. The two most important elements of this approach include implementation of an employer-based travel demand management program and the encouragement of mixed-use development patterns, which facilitate walking, bicycling and public transit ridership.

Policy	Strategy	Responsible Party	Time Frame/ Years
<p>Policy T4.1—Promote Transportation Modes Other than Single Occupancy Vehicles</p> <p>The City and County shall develop a transportation demand program that promotes and facilitates the use of transportation modes other than single occupancy vehicles.</p>	<p><i>Strategy T4.1(a)—Cooperate with Area Employers</i></p> <p>The regional demand management program shall focus on a cooperative effort with area employers to reduce drive-alone commuting.</p>	City & County	Through-out life of <i>Regional Plan</i>
	<p><i>Strategy T4.1(b)—Implement the Regional Plan Land Use, Neighborhood, and Economic Development Policies</i></p> <p>The <i>Regional Plan</i> emphasizes mixed-use neighborhoods, activity centers, and employment centers supported by a network of pedestrian, bicycle, transit and automotive systems. The vertical and horizontal mix of uses places them close enough to permit walking and bicycling. The intensity of use at the centers facilitates transit service.</p>	City & County	Through-out life of <i>Regional Plan</i>

FLAGSTAFF AREA MOBILITY TRENDS AND CONDITIONS

Projected population growth will bring with it increasing traffic to the Flagstaff area. Daily travel is expected to grow to 3.8 million daily vehicle miles of travel (VMT) by 2020, an 84% increase over 1997. However, population growth will account for only about 65% of the growth in VMT, with the rest attributable to other causes.

First, the average length of local trips has been increasing. This will continue as residential development occurs at locations removed from commercial areas. Second, daily vehicle trips will grow faster than population due to increases in daily travel by visitors and tourists. There will also be increases in through-traffic on the state highways, including truck traffic. Finally, Flagstaff will continue to serve as the primary economic center for a growing north-central Arizona region.

Over 90% of daily person trips in the Flagstaff area utilize private motor vehicles (PMVs). Less than 10% of mobility in the winter is accomplished via public transit, walking and bicycling. In the summer these modes account for only about 12% of daily trips. However, many larger cities in the mountainous west are working aggressively to reduce “auto dependency” and enable “alternative modes”—transit, walking, bicycling—to account for more than 25% of daily travel in some cases.

Table 4 below provides an estimate of the potential impact of modal shift programs in Flagstaff, including adequate investment in transit and pedestrian and bicycle infrastructure. This conservative estimate is based on cities of comparable demographics and climate and with levels of facilities and services that Flagstaff may achieve within the planning period. Supporting transportation demand management programs (e.g., employer transportation coordinator networks) would also be needed.

Table 4: Potential Modal Shifts—Flagstaff Region (by 2020)

Percent of Daily Person Trips	Summer/Fair		Winter/Inclement	
	Now	Potential	Now	Potential
Pedestrian	10%	15%	8%	14%
Bicycle	2%	6%	1%	2%
Public Transit	< 1%	3%	1%	4%
“Alternative Modes”	12%	24%	10%	20%

FLAGSTAFF AREA MOBILITY ISSUES AND OPPORTUNITIES

Achieving a Pedestrian-friendly Community

Citizens involved in the *Flagstaff 2020* visioning process placed considerable emphasis on a desire for the greater Flagstaff area to become a pedestrian-oriented place. This was one of the major themes emerging from the vision.

Yet, Flagstaff today does not represent an ideal pedestrian environment for these reasons:

1. Lack of sidewalks.
2. Poor street crossings.
3. Sidewalks are too narrow and too close to the road.
4. Public transit service is minimal.

At the same time, Flagstaff has important assets that could support the development of a walkable city. It is relatively small in scale, with many destinations located within what could be walking range. Finally, the local climate is relatively mild by North American standards with cool summers and cold but sunny winters.

The Flagstaff area would benefit from a concerted effort to become a walkable city. This would improve quality of life for all classes and ages of people. It would reduce congestion by avoiding the unnecessary use of roadway system capacity for short trips. Finally, it would support economic vitality and sustainability.

Capitalizing on the Bicycling Opportunity

A number of university towns in the western U.S. stress bicycling as a mode of travel. In these places, bicycling plays a significant role in daily mobility.

Informal interviews with bicyclists and bike shop employees reveal that the Flagstaff area is regarded as “good” for bicycling because the city is small in scale (many destinations fall within a five-mile radius for many residents) and because a network of “excellent” rural and forest trails is directly accessible from the city without need for recourse to a motor vehicle for transport to a trailhead. However, local bicyclists complain about traffic on the major thoroughfares and about the lack of bike lanes. They also note that local streets are icy much of the winter.

The City has pursued completion of a Flagstaff Urban Trails System (FUTS) since the mid-1980s. This is planned as a citywide network of non-motorized transportation corridors and linear recreation areas. FUTS trails are planned as connections to and between employment centers, **activity centers**, neighborhoods, schools and parks. The FUTS network includes “primary” and “secondary” segments. The bicycle system plan also includes on-street bike lanes and bike routes.

The Flagstaff area has the potential over the next twenty years to become an environment where bicycling adds significantly to personal mobility for residents, where traffic (at least in fair weather) is reduced by diversion of trips to bicycles and bicycles linked to transit, and where bicycling is a significant recreational attraction for residents and visitors alike. This will require completion of the Flagstaff Urban Trails System and an extensive network of on-street bike lanes connecting living, shopping, and employment locations.

Planning a Future Roads and Streets System

Vehicular Transportation System Overview

The Flagstaff area is served by a hierarchy of roadway types, including freeways and arterial, collector, and local streets that provide mobility and access for residents. Arterial streets include interstates and major and minor arterials. Freeways include Interstate 17, which provides access to Phoenix and connections to Interstate 10; and Interstate 40, which provides access to Albuquerque, Las Vegas, Los Angeles, and points along the eastern coast of the U.S.

Major arterials providing inter-regional access include U.S. Highways 89 and 180, and State Highway 89A. Other arterials important to the region include historic Route 66 through the downtown Flagstaff area and points east and west of the city.

The road network is the principal infrastructure for all modes of travel. Transit buses run on the streets mixed with other motor vehicles. Most sidewalks run along streets and are built as part of the street cross section. Bike lanes (often the most direct type of bikeway) are a part of streets, and many FUTS trails run parallel to or along streets.

Roadway System Issues

The process of planning for the future of the Flagstaff area roadway system revolves around three issues:

- How should development respond to increasing congestion?
- What kind of network does the Flagstaff area need?
- What specific roadway projects should be pursued?

The amount of the Flagstaff area roadway system that is “congested” will increase from only about 8 miles today to over 47 miles by 2020. Motorists using these roads will encounter long queues and significant delays at traffic signals, especially during peak travel times (7:30 to 8:30 AM and 4:00 to 6:00 PM). The most heavily traveled and congested parts of the network will be the state highways through the core area: U.S. 66 east and Milton Road. This will greatly increase the number of people using I-40 for local trips. The Flagstaff Metropolitan Planning Organization will need to wrestle with the issue of what to do about this congestion. Supply-side approaches—building bigger, wider streets and new roads—bring significant costs and impacts and may not be as beneficial in alleviating congestion as hoped.

In most cases the congestion occurring in a given roadway corridor is caused not by an inadequate number of through lanes, but by the intersections. Wherever signalized intersections exist, the capacity of the roadway to deliver cars to the intersection significantly exceeds the capacity of the intersection itself, since at least some portion of the “green time” must be allocated to the cross street movement.

This phenomenon has caused some cities to adopt a “narrow roads, wide nodes” approach where improvements to intersections (turn lanes, signal optimization) are favored over “add-lanes” projects.

What kind of network does the Flagstaff area need?

Recent research indicates that much of the benefit of a rectilinear grid—which Flagstaff’s terrain prevents—can be achieved by simply requiring better **connectivity** between subdivisions and between residential areas and commercial areas. The requirement that collectors and connectors be planned and built either by developers or as public/private partnerships can achieve much of the benefits of a grid, while still allowing a curvilinear street layout that conforms well to the landscape. (A connector is a street that does not provide long distance continuity, but does connect adjacent developments.)

An evaluation of the Flagstaff area roadway network reveals two significant characteristics that are affecting traffic distribution and the resulting congestion. First, a well-connected continuous system of streets for north-south movements is lacking. Part of this problem results from discontinuities (missing links) in routes, but part of it relates to a simple lack of north-south collector or arterial routes. The strongest traffic growth is projected for areas south of I-40 with destinations as far north as Route 66. This further underscores these missing north-south links.

Second, the railroad presents a significant barrier to travel within the core of the city. Addressing these two issues and requiring better connectivity in the planning of developments would do much to provide the roadway capacity that the Flagstaff area will need by 2020.

What specific roadway projects should be pursued?

Based on the above discussion of roadway issues, a categorization of projects is presented in Table 5 along with an initial suggestion of overall priority.

Table 5: Types of Roadway Projects

Category	Project Type	Suggested Priority
Capacity Increase, System Expansion	New roadways	Low
	Add lanes to existing roadways	Low
Network Connectivity, Missing Links	New roadways to eliminate missing links	High
	Grade separations over railroad	High
	Interchanges connecting to new roadways built to eliminate missing links or new grade separations over railroad	High
System Efficiency	Intersection upgrades, new turn lanes	High
	Traffic signal coordination, timing, maintenance	High
	Access management systems	High
	Incident management systems	High
	ITS/Smart highways	Low
Safety	All types	High

Two final issues should be addressed in planning a future roadway system for the Flagstaff area: traffic signal coordination and maintenance and highway access management.

Signals will play a major role in determining the efficiency of the road and street network in moving traffic.

Another aspect of roadway system development is rigorous management of access from adjacent properties. This is most important for collector and arterial roadways and most problematic in commercial areas. The addition of numerous driveways in commercial corridors (and especially in areas that are developing into commercial corridors) has a major impact on the effective throughput capacity of the roadways.

Developing a Transit System

The region’s public transit company is Pine Country Transit, which functions as a joint operation of the City of Flagstaff and Coconino County. Pine Country provides service Monday through Friday on three routes, with limited service on Saturday. Pine Country, who is changing its name to Mountain Line, operates a fleet of six transit vehicles on its normal fixed route system. In addition, Northern Arizona University operates a transit system for intra-campus movement of students, running on a fixed route from 7:30 AM to midnight.

As part of this project, a peer comparison of six other transit systems was prepared to help assess how Flagstaff is doing relative to what similar communities have done. The cities chosen are all western mountain towns with universities. The results are summarized in Table 6 below. As most local observers already realize, Flagstaff has yet to build a significant fixed route transit system.

Table 6: Peer Cities Transit Systems Comparison

	1998 Service Area Population	Number of Routes	Peak Local Headways (minutes)	Annual Bus Hours per Capita	Peak Fleet (buses)	Annual Operations Budget	Operations Budget per Capita	Annual Ridership per Capita
Boulder	98,312	27	6	2.22	71	\$14.0 M	\$143	67
Eugene	236,100	63	30	1.01	73	\$14.5 M	\$61	28
Flagstaff	63,801	3	60	0.15	3	\$0.4 M	\$6	2
Fort Collins	95,899	14	30	0.51	16	\$2.9 M	\$30	17
Logan	32,964	8	30	0.67	8	\$0.8 M	\$24	26
Missoula	60,930	12	30	0.53	17	\$1.7 M	\$28	10
Pocatello	53,392	9	60	0.34	8	\$0.6 M	\$11	4

However, what is less obvious, but clearly shown by the data, is the strong relationship between expenditures and ridership. (One anomaly is Logan, which operates its system as a fare-free service, thus generating a high ridership level per bus hour and per dollar of expense.) Flagstaff’s low transit ridership is directly attributable to the low level of service.

ROADWAYS SYSTEM PLAN

The Roadways System Plan illustrates existing and future significant street facilities and projects that establish the region’s roadway circulation network. The projects identified improve access and mobility by improving access to alternate east-west routes, reducing the impact of rail traffic on circulation, and establishing new parallel or alternate routes in some areas.

Traffic congestion has been gradually increasing in the Flagstaff region over the past decade. It is particularly noticeable at the entrances to the city at the intersections of Ft. Valley Road and Columbus Avenue, Lake Mary Road and Beulah Boulevard, and U.S. Highway 89 and Country Club Drive. Congestion is also growing at major internal intersections like Route 66 and Enterprise, Route 66 and Butler, and Milton Road and West Route 66. Congestion is expected to increase in the Flagstaff area, and the transportation improvements depicted are intended to manage congestion, not eliminate it. Congestion management efforts include improving the region’s network of arterial and collectors to provide better alternate routes, synchronizing traffic signals and controlling access to major roadways to maximize the efficiency of existing streets, and emphasizing alternate modes of travel to reduce demand for roadways.

The roadway classifications shown on the plan include freeways, arterials and major collectors. “Freeways” are the Interstates, I-40 and I-17. These are high-speed facilities with access permitted only at traffic interchanges. “Arterials” are high-capacity or relatively high-capacity roadways that connect the region to the state or enable travel across the region. “Major collectors” are those roadways that gather traffic in a district from the local residential and minor collector streets serving the neighborhoods and deliver it to the arterial system. The roadway classification guides decisions about the design of facilities, access to them, traffic calming, and landscaping.

Future planned or potential grade separations are also shown on the plan. These are the I-40 traffic interchange planned for Lone Tree Road and a grade separated intersection with Route 66 and Enterprise Drive that would be associated with a future railroad overpass project at Enterprise Drive.

The planned street improvement projects are numbered and categorized according to the agency or entity responsible for their construction. Arizona Department of Transportation (ADOT) projects correspond with proposed improvements in the ADOT I-40 Corridor Profile and I-17/US89 Corridor Profile. They will be programmed at ADOT’s discretion. Locally funded projects will require new revenues that may include bonded indebtedness, sales taxes, and impact fees. Other road improvements may take place through special assessment districts in the county. It is anticipated that developer-funded projects will be built by the private sector as development takes place.

The map also identifies **multi-modal** corridors for the region. These corridors will be targeted for public and private investments in many modes of travel. They create a transportation grid that will enable people to travel around town without the need for automobiles. These corridors could include bike lanes or paths, improved intersection crossings for pedestrians and bicycles, and transit facilities, such as bus pullouts, shelters, and benches.

Roadway Planning Categories

Roadway categorization based on function provides guidance to the County, the City and the state in making decisions about roadway design, connections, adjacent land uses and other characteristics of highways and streets. Through this system, roadways within the region are categorized for the planning purposes of access management, design standards, **multi-modal** purposes, and traffic mitigation. The planning categories shall include at least the following:

- Freeway
- Minor Arterial
- Minor Collector
- Local Commercial
- Local Narrow Residential
- Major Arterial
- Major Collector
- Connector
- Local Residential
- Alley

Connector roads identified in Policy T1.6 will be designed in compliance with connectivity Policy T1.2 and traffic mitigation Policy T1.4. Connector roads are built or platted as temporary deadends or as required connections to adjoining tracts and also will be designed into future developments. The accompanying map (Map 10: Roadway Categorization Plan) assigns roads to a category with the exception of alleys, private roads, and roads under federal jurisdictions. Alleys will be identified after completion of a field study.

The “function” of a roadway takes into account the purpose of that roadway in the regional roads and streets grid. Roadways may:

- connect the Flagstaff/Coconino region to other regions, the state and the nation;
- connect local districts within the Flagstaff/Coconino region; or,
- provide internal circulation within local districts.

Function also considers the character of each roadway based on abutting land uses, and the role of each corridor in supporting a **multi-modal** system of regional mobility. The planning categorization drives decisions in at least three areas to be developed in separate documents:

1. roadway design/cross section—i.e., maximum lane configuration, roadway width, bicycle accommodation;

2. traffic mitigation—i.e., traffic calming, speed reduction; and
3. access management—i.e., allowable connections to other roads and abutting property.

Certain roadways also occupy corridors that are designated as Multi-modal Corridors. The Multi-modal Corridors are mapped as an overlay to the planning categorization map.

Roadway Planning Category Summary Descriptions

A full description will be developed based on the following table and Strategy T1.6(a)—Adopt a Roadway Planning Categorization System and Map.

Freeway:

Purpose and Character: Freeways serve as high-capacity, high-speed facilities for long trips across and through the region. They tie this region to the state and nation. Freeways require massive infrastructure and rights-of-way (up to 300 ft. or more) and are intended to carry heavy traffic volumes at high speeds with a relatively large percentage of trucks. They are designed with full access control. Adjacent land uses may include commercial areas, open space, public lands, industrial sites and certain institutional sites. Residential property will not abut Freeways unless separated by adequate buffering.

Major Arterial:

Purpose and Character: Major Arterials provide relatively high-capacity roadways for longer trips. They provide direct service to major regional centers of activity and often serve as boundaries between districts. Major Arterials provide roadway continuity and length for trans-regional, inter-regional and inter-state trips and connect the Flagstaff region to surrounding regions. Throughput capacity will be emphasized over local access. Adjacent land uses include commercial areas, open space, public lands, industrial sites and institutional sites. Residential property will not abut Major Arterials unless separated by adequate buffering.

Minor Arterial:

Purpose and Character: Minor Arterials provide capacity and continuity for travel between different districts of the region. Adjacent land uses include residential and commercial areas, open space, public lands, industrial sites and institutional sites. The activity center for a district will often be located along a Minor Arterial or at the intersection of a Minor Arterial with another Minor Arterial or a Major Collector.

Major Collector:

Purpose and Character: Major Collectors collect traffic from Minor Collectors and Local streets within a district and deliver that traffic to Major or Minor Arterials. They are generally not intended to serve trans-regional trips and generally will not provide route continuity for more than a mile or two (except in rural areas where they may be longer). These roadways are generally contained entirely within a district and connect the neighborhoods of that district with each other. Adjacent land uses include residential areas, commercial areas, open space, public lands, industrial sites and institutional sites.

Minor Collector:

Purpose and Character: Minor Collectors collect traffic from Local streets and deliver it to Major Collectors or Minor Arterials. They will not serve trans-regional trips and will not provide route continuity for more than a mile (except in rural areas where they may be longer). Adjacent land uses include residential and commercial areas, open space, public lands, industrial sites and

institutional sites. The contribution of Minor Collectors to the structural framework of the region is minimal, but will affect neighborhood form.

Connector:

Purpose and Character: Connectors provide for direct vehicle, bicycle and pedestrian connections between adjacent neighborhoods, and between neighborhoods and commercial areas. Connectors provide no route continuity beyond the areas they connect. Adjacent land uses include residential areas, commercial areas, open space, public lands, industrial sites and institutional sites.

Commercial Local:

Purpose and Character: Commercial Local streets provide for direct vehicle, bicycle and pedestrian access to commercial land uses. The streets do not serve trans-regional trips and provide no route continuity beyond the areas they connect. Adjacent land uses include commercial areas, industrial sites and institutional sites.

Residential Local:

Purpose and Character: Residential Local streets provide for direct vehicle, bicycle and pedestrian access to residential land uses. Residential Local streets do not serve trans-regional trips and provide no route continuity beyond the areas they connect. Adjacent land uses will primarily be residential.

Narrow Residential Local:

Purpose and Character: Narrow Residential Local streets provide for direct vehicle, bicycle and pedestrian access to residential land uses. They do not serve trans-regional trips and provide no route continuity beyond the areas they connect. Adjacent land uses will primarily be residential. They differ from Residential Local streets in design and in connectivity.

Alley:

Purpose and Character: Alleys provide secondary access to the rear of residential or commercial properties that are served by a street. Alleys may also be used to provide access to parking garages and surface parking lots. Alleys do not carry trans-regional trips and provide no route continuity beyond the areas they connect.

Table 7: Roadway Planning Categories Summary

Roadway Classification	Route Function	Terminate At	Access Control	Maximum Vehicle Lanes	On-Street Parking	Bicycle Provision
Freeway	Interstate & inter-regional travel	Freeways or Major Arterials	Full Control	6 thru lanes, ramps as needed	No	Allowed on shoulder of some routes
Major Arterial	Inter-regional and inter-district travel	Freeway, Major Arterial, Minor Arterial	Partial Control	2 (rural) to 6 (urban) thru lanes, turn lanes as needed	Only in downtown Flagstaff	On-street lanes or parallel, close-by facility
Minor Arterial	Local travel between districts	Freeway, Major Arterial, Minor Arterial	Partial Control	2 - 4 thru lanes, 4 lane maximum	Yes, in commercial areas only	On-street bicycle lanes
Major Collector	Collect local traffic and deliver to arterials	Major Arterial, Minor Arterial, Major Collector	Partial Control	2 - 4 thru lanes, 2-way left turn only with 3-lane total	Yes, in commercial areas only	On-street bicycle lanes
Minor Collector	Collect local traffic and deliver to major collectors and arterials	Major Arterial, Minor Arterial, Major Collector, Minor Collector	Partial Control	2 thru lanes, turn lanes as needed, 2-way left turn only with 3-lane total	Yes, if width is available	On-street bicycle lanes
Connector	Connect adjacent neighborhoods	Minor Collector or Local	Partial Control	2 thru lanes, no turn lanes	Yes, if width is available	Bikes in vehicle lanes
Commercial Local	Access to commercial land uses	Major Arterial, Minor Arterial, Major Collector, Minor Collector	Partial Control	2 thru lanes, left turn lane if needed	Yes, if width is available	Bikes in vehicle lanes
Residential Local	Access to residential land uses	Major Collector, Minor Collector, Connector, Local	Partial Control	2 thru lanes, no turn lanes	Yes, if width is available	Bikes in vehicle lanes
Narrow Residential Local	Access to residential land uses	Minor Collector, Connector, Local	Partial Control	2 thru lanes, no turn lanes	Yes, if width is available	Bikes in vehicle lanes
Alley	Access to adjacent land uses	Major Collector, Minor Collector, Connector, Local	Partial Control	Lanes not delineated	No	Bikes in vehicle lanes

PLANNED ROADWAY IMPROVEMENTS

The following roadway projects and programs are included in the Transportation Plan. Certain other projects were considered in the planning process and, in some cases, were modeled but are not included in the plan because the analysis indicated they would contribute little value to the system. Some projects will eventually be needed, but are not planned within the 2020 planning horizon; these are indicated in the list below.

Arizona Department Of Transportation (ADOT) Projects

Projects included in the plan are:

- widen I-40 from I-17 to Country Club
- widen I-17 from Kachina Village to I-40
- reconfigure/reconstruct the interchange at Country Club and I-40

The reconfiguration of the Country Club interchange provides the most significant local benefit and its advancement by ADOT will be supported by the City and County. The over-widening of I-40 (beyond 6 lanes) is unwarranted and not recommended by this plan.

Developer-funded Projects Within the 2020 Horizon

Projects included in the plan are to extend:

- J.W. Powell from Lake Mary Road to new Lone Tree Road
- University Avenue to Woody Mountain Road
- Woody Mountain Road to Beulah Boulevard
- Fourth Street through Canyon del Rio

The City and County will require these projects to be built as development occurs, but will not provoke premature, leapfrog development in outlying areas by advancing or encouraging these projects before they are needed.

Developer-funded Projects Outside the 2020 Horizon

Projects which will someday be needed, but which are not included in this plan include extending:

- J.W. Powell from new Lone Tree to Fourth Street
- Butler Avenue east to Old Walnut Canyon Road

Local/Private/ADOT Joint Projects

Projects included in the plan are:

- build the Lone Tree Interchange with I-40
- extend “new” Lone Tree to J. W. Powell

The Lone Tree Interchange with I-40 coupled to the extension of “new” Lone Tree to J. W. Powell provides a critical linkage for the fastest growing travel market in the region—trips from south of I-40 into the core. The Lone Tree corridor will provide significant relief to Milton Road, San Francisco Street, Beaver Street and other streets in and around the University. Finally, this project will add a new north-south arterial in the core area, which is needed. Care will be taken to manage access to the new roadway and to ensure that development in the corridor and especially around the interchange is consistent with the Land Use Plan and is well-designed. This project is linked with the “Tank Farm” grade separation in the next category.

Locally-funded Projects Within the 2020 Horizon

Projects included in this Plan fall into five categories:

1. Railroad separations providing needed connections between the principal east-west corridors and improving continuity of the north-south arterial system. Build:
 - Fourth Street separation structure over the railroad, connecting into Route 66
 - Enterprise separation structure over the railroad, connecting into Route 66
 - Tank Farm separation structure over the railroad, connecting into Route 66
2. Simple connections and extensions designed to eliminate missing links in the roadway grid. Extend:
 - Soliere Avenue west to Fourth Street
 - Beulah Boulevard north to Yale Street
 - University Drive (stub) west to Beulah Boulevard
3. Intersection improvements providing “wide nodes” in a heavily-traveled street system:
 - Improve Route 66 westbound right turn to Fourth Street northbound
 - reconfigure/reconstruct intersection of Steves Boulevard and Lakin Drive
4. Projects which solve an important neighborhood issue:
 - provide traffic calming on Lockett Road
5. Projects which provide a significant system-wide benefit. Implement:
 - a connected, coordinated computer-controlled traffic signal system
 - an access management system cooperatively with Arizona DOT

Locally-funded Projects Outside the 2020 Horizon

Projects which will someday be needed, but which are not included in this plan include:

- Extend J.W. Powell east from airport to Lake Mary Road
- Build Rain Valley Road

Evaluation of Planned Roadway Network

Daily VMT (vehicle miles of travel)—the number of daily vehicle trips times the average trip length—is expected to grow about 82% by 2020. Both the roadway projects and the other modal programs combined with the roadway projects would reduce VMT in 2020 somewhat. This is an important characteristic of the proposed plan.

It is common for roadway improvement programs to increase daily VMT because they increase circuitous travel on new beltways and suburban roadways. However, this plan, which focuses roadway improvements in the core areas, will not have that effect. The average vehicle trip length in 2020 would be expected to be about 14% longer than today due to growth and land development patterns. Implementing the roadway projects will reduce this slightly by pulling trips onto core roadways (e.g., the new Tank Farm overpass). At the same time, implementing the full transportation plan (all modes) will increase average vehicle trip lengths slightly because most of the trips shifted to walking and bicycling are short, leaving the longer trips for driving and public transit. So, average person trip length will remain about the same, but average vehicle trip length will increase.

If this Transportation Plan were not implemented, the extent of congested roadways in the Flagstaff region would increase markedly by 2020. Level of service F (stop and go in peak

hours, with long delay at traffic signals) conditions would prevail on nearly 20 miles of roads, up from only about 3 miles in 1997.

MULTI-MODAL SYSTEM

This Transportation Plan is designed to achieve a balanced reliance on multiple transportation modes: single-occupant vehicles, multi-occupant vehicles, public transit, bicycling, and walking. This balance will enable the Flagstaff metropolitan area to attain high levels of mobility and accessibility while preserving community character and quality of life. Achieving a modally balanced transportation system rests on two general strategies:

- first, that investments be made in public transit, bicycling and walking systems to a greater extent than in the past (balancing the historic emphasis on investments in roadway capacity); and
- second, that the design of roadway projects take into account the circulation and safety needs of all modes (recognizing that the road network is the principal infrastructure, not just for private motor vehicles, but for all modes).

In addition to these programs, the City and County, working with the state and with private developers, will make targeted improvements in the roads and streets network. These are described in the Roadway System Plan section below.

This plan is designed to support the Comprehensive Plan of the City of Flagstaff and Coconino County, including the Land Use Plan and desired land development pattern. Consequently, the Transportation Plan targets resources and investments in a manner intended to support a **compact**, efficient urban form while at the same time protecting and enhancing existing neighborhoods and commercial areas.

Transit System

The Regional Transit System Plan (Map 9) is based on broadly stated goals and quantitative objectives derived from the Regional Transportation Plan, and on specific public transit system goals and objectives developed with the Transit Advisory Committee and the *Regional Plan* Task Force.

The public transit system goals state that public transit should be a genuine choice, financially accountable, a growth management tool, and integrated into a multi-modal system.

Specific objectives guiding the Transit Plan include targets for annual boardings, daily person trips, costs per boarding, and net operating ratio (fare box recovery ratio); a description of the future transfer system; and cooperative efforts between Northern Arizona University, the City of Flagstaff, and Coconino County, which operates the system, to provide for expanded transit operations.

Existing service was evaluated in terms of existing operations and in comparison to other peer cities to develop planned transit service changes. Some limitations of the existing system include long circular routes, excessive time between buses and limited service hours. In comparison with the other cities, the Pine Country transit system is operated efficiently; however, because of low ridership, the cost per boarding is high, which in turn leads to a low fare box recovery ratio. The Flagstaff region also offers the lowest level of transit service in terms of bus hours per capita.

Development of a future transit system requires an understanding of which key markets to serve. The markets identified by the plan include current transit patrons, college students,

commuters and core area short trips. Four specific service needs are also identified: fast cross-town travel, higher service frequency, core area circulation and an efficient transfer system.

Several strategies were developed to ensure success of the future system: employee pass program, student pass program, attractive vehicles, convenient bus stops and transfer centers, pedestrian access to the bus system, improved bus circulation, and need for a marketing program.

The planned future transit service will be organized around an express spine route operating along east and west Route 66 (between the city's southwest commercial area and the Flagstaff Mall). A core area circulator will connect the hospital, Downtown and Northern Arizona University. Finally, local routes will provide service to individual neighborhoods. The local service routes will connect to the spine route and the circulator at timed transfer nodes located in southwest Flagstaff, Downtown, midtown, and at the Flagstaff Mall.

Other elements of the service plan include extended weekday service, increased Saturday service, the addition of Sunday and holiday service, and increased peak hour service frequencies to 30 minutes.

The Transit Plan will be reviewed every two years to determine progress toward achieving goals and objectives. As the Transit Plan calls for service expansions, the success in implementing the service changes must be reviewed. Success will be monitored through specific operational parameters including number of weekday boardings, operating costs per boarding and fare box recovery ratio.

Transit System Plan

The Transit Systems Plan depicts future improvements to area transit service. Existing routes are not shown. Current service will be improved, reducing headway from 70 minutes to 30 minutes over the next 3 to 5 years. The service areas shown on the map will be connected by the improved transit system. Key future improvements include the "spine" route running from the Flagstaff Mall to the vicinity of the Woodlands Village Shopping Center; the Downtown circulator extending from the Flagstaff Medical Center through Downtown to Northern Arizona University; and improved local service to the residential markets. The service to these local markets will effectively replace today's service and route structure.

Implementation of the plan will improve service to those people who depend on transit, provide viable commuter service for those who choose to utilize it, and generally increase regional mobility. Coordination with the Northern Arizona University transit system will facilitate the implementation of these improvements. Transit policies may be found in the text under the Transportation Plan.

Non-Motorized Systems

A final, critically important element in this multi-modal Transportation Plan is the development of good pedestrian and bicycling systems throughout the region, especially in core areas.

Walking—the "pedestrian mode"—is the foundation of all mobility in the Flagstaff region. In addition to serving as a convenient, inexpensive and healthy means of making short trips, the pedestrian system provides access to transit and to auto parking. Bicycling also serves as basic mobility and as access to other modes.

A major emphasis in the Transportation Plan is placed on improving sidewalks, crosswalks and other walkways with the objective of developing a safe, continuous, well-connected pedestrian

system. Much of this will be accomplished through the design standards utilized in the construction of roads and streets projects and by incorporating well-designed pedestrian facilities into improvement projects. Private developers will make additional improvements to the pedestrian system as part of residential and commercial development projects.

Finally, the City and County will make direct investments where needed to eliminate important missing links (discontinuities) in the pedestrian system; provide improved crosswalks at intersections; and provide grade separations where high traffic volumes discourage pedestrian crossings.

The Flagstaff area enjoys a climate conducive to bicycling for all but a few weeks of the year. The urbanized area also benefits from ready access to a network of recreational trails on the public lands surrounding the city. Over the next 20 years the City and County will work cooperatively to complete the planned FUTS (Flagstaff Urban Trails System) network and to provide on-street bike lanes and signed bike routes so that there is a continuous, connected system of bicycling facilities available to all areas of the region.

Trails and Bikeways

The trails system and the bikeways system are often considered separately. They seem to have different functions, physical layout, and development procedures. However, they are actually planned to be interrelated, overlapping, and complementary in all these features. The systems maps that relate to them are the FUTS and the Bikeways Plan. However, the county trails program will consider trails and bikeways together.

Trails

The Flagstaff Urban Trail System, begun in 1989, is conceived as a combination recreation and alternative transportation system both within the city and connecting to surrounding national forest areas. (FUTS links typically are not only off-street pathways, but they are also completely separated from and independent of the street system.) Development strategy for FUTS has emphasized linking various parts of the city via primary trail corridors where there is a realistic possibility of acquiring needed right-of-way without condemnation or purchase of developed land at market prices. Use of existing greenbelts is a high priority. About 22 miles of trail are currently completed; approximately 30 miles more are proposed.

Development of FUTS is highly dependent on implementation of the City's Urban Open Spaces Plan, as the FUTS is either implemented through adjacent, private development dedication or public acquisition. In many of the older sections of the city, open space corridors are unavailable or discontinuous. In these locations, the FUTS makes use of roadside pathways that are also considered part of the Bikeways System.

While build-out of the primary system, which links important parts of the city such as arterial roads, is intended to occur via a combination of City funding and development requirements, it will eventually be completed whether or not there is adjacent private development. The secondary FUTS system, which consists mostly of connecting links such as collector roadways, will occur at the pace of development. This is particularly significant in the case of trail links through non-City-owned open space areas with little or no projected development.

Proposed Trail Link or System

Principal proposed FUTS and Arizona Trail Loop linkages include the following:

- A downtown FUTS crossing west of City Hall is to be included with the construction of the proposed Rio de Flag project. It is to include grade separations under Route 66 and the main line tracks of the BNSF Railroad. It is the new link between Wheeler Park and the existing Rio Canyon trail near I-40.
- The Foxglenn trail will provide a link to schools, neighborhoods, and Foxglenn Park in the southwest part of the city.
- The Bow & Arrow trail will provide a link to neighborhoods, schools, parks, the airport complex, and a loop to the University Heights/Tuthill trail.
- The Cheshire trail will provide a link to neighborhoods, Cheshire Park, the Museum of Northern Arizona, downtown, the FUTS system, and future development.
- The Rio de Flag alignment through downtown and east will connect the Rio north and the Rio south trail systems through the center of the city. It will also provide continuity between elements of the south side bikeways system and the Route 66 FUTS pathway. It is proposed that this project be constructed in conjunction with the Army Corps of Engineers' Rio de Flag floodplain project and include pathway undercrossings at Beaver Street and San Francisco Street. This will still grade separate at Burlington Northern Santa Fe (BNSF) streets as a greenbelt trail fully separated from the nearby street system.
- The McMillan Mesa trail would connect the Route 66 system with the McMillan system, the U.S. Forest Service trail system, and future development.
- The US 89/Rio/Old Route 66 east trail link would extend the system into the northeast portion of the city, connecting to the U.S. Forest Service trail system and Walnut Canyon National Monument.
- The Woody Mountain Road/Sinclair Wash/Flag Ranch Road trail will extend the FUTS system to the western portion of the city, to future development, to the Arboretum, and onto U.S. Forest Service lands.
- The Railroad Springs trail system will connect the Observatory Mesa trail back to the western part of the city, the Route 66/Woodlands Village system, and U.S. Forest Service lands.
- The Lake Mary Road to Fisher Point trail system will connect to other trails in the area, future development, and the U.S. Forest Service trail system. The Foxglenn to Fisher Point/Arizona Trail System trail will connect to other area trails, future development, and the U.S. Forest Service trails system.

The Arizona Trail

The Arizona Trail, a cross-state multiple-use trail, will form a loop through Flagstaff when complete. Traveling north-south, the trail now passes Marshall Lake and splits at Fisher Point. The Flagstaff segment will then travel north through the city, utilizing the FUTS system to connect to Buffalo Park and the Forest Service system trails. The alternate route, the Flagstaff Bypass, heads east from Fisher Point past Walnut Canyon, crossing Interstate 40 near Cosnino and will then loop back north, crossing Highway 89 near Elden Pueblo to connect with the existing Forest Service system trails. These two routes will meet at Schultz Pass where the trail will then continue to the Utah border.

Level of Service Standards—City FUTS

Primary trails are now required to have 10 feet of surface width, with at least 2 feet of shoulder on each side. Most existing trails have a specially designed packed aggregate surface. Some links, particularly those that serve as bike paths adjacent to streets, are already asphalt or concrete surfaced. Future links will be asphalt or concrete where use is anticipated to be high or where there are special maintenance concerns.

Connectivity is the single most important criterion in defining desired FUTS trail links. The goal is to link as many trail users, significant residential neighborhoods, commercial districts, schools, parks, and USFS trails as possible.

Safety is the other major criterion in defining system deficiencies. Grade crossings or other crossing improvements are proposed so trail users can access surface streets with adequate provision for safe movement. In some cases, existing concrete boxes or grade separation structures will be utilized; in others, new crossings are indicated. Grade separations are indicated wherever a primary link crosses a major highway or railroad at grade. Trail development is also linked to the City's roadway development policy, piggybacking FUTS links and crossings onto already proposed roads and bridges where possible.

Coconino County Future Trail Needs

The Coconino County Parks and Recreation Department has recently created a trails program and will develop a Coconino County Trails and Greenways Plan. This plan will be a cooperative effort between the county and local, state, and federal land managers. The plan will identify trails and greenway corridors, inter-agency trail linkages, and trail user education and volunteer programs.

The County will extend the FUTS system to communities outside the city limits. For example, the Sinclair Wash FUTS Trail now ends within Fort Tuthill County Park. The County intends to extend this trail to Kachina Village and Mountaineer. The Trails Plan will identify other potential trail connections.

Bikeways

City of Flagstaff policy acknowledges the bicycle as a legitimate transportation mode to be accommodated on the public street system. With the exception of the interstate highways, every street in the city is considered to be a bicycle street. New private and public street construction is designed to accommodate the cyclist in all new projects. Traffic and parking restrictions have been implemented on many streets to provide bike lanes, and the City Traffic Code has been amended to support cycling, even to the point of allowing bikes on sidewalks. The goal of past planning and development has been to create a physical bikeway system that allows cyclists the opportunity to move safely and conveniently throughout all parts of the community.

There are now marked bike lanes on approximately 21 miles of city streets, mostly arterials and collectors, and there are over 4 miles of streets with adjacent bike paths. The travel mode shift desired by the plan is starting to occur. The existing systems still lack internal connectivity and coverage in many areas, as well as connections between the City and the County. The *Regional Land Use and Transportation Plan* emphasizes that both a concerted effort to complete missing links in the system and an active promotion of cycling to reduce traffic problems are critical.

In summary, the emphasis of the *Regional Plan* with respect to bicycling is:

- Effectively utilize cycling to meet local mobility choices and needs.
- Facilitate cycling as a mode other than single occupancy vehicle.
- Actively promote mode shift to cycling.

Bikeways System Plan and Map

The Bikeways System Plan identifies an interconnected system of on-street bike lanes and off-street multi-use paths adjacent to the streets, which complements the urban trail systems (FUTS). The function of the bikeways system is more utilitarian than the trails system. The bikeways system consists of direct, high-speed connections between trip ends on paved routes on and along streets that interconnect adjacent neighborhoods and commercial districts. When completed as planned, as Bikeways and FUTS systems, they will serve all the cycling needs of the community:

- Commuters, who need efficient routes between home and other destinations such as work, Northern Arizona University, Coconino Community College, or school.
- School children, who need safe, direct routes between home and activity centers, schools, or parks.
- Recreational cyclists, who wish either to ride from home along nearby off-road trails or to directly access the more distant network of regional trails.

Short, convenient utility trips that were previously made by walking or driving could be made more easily and efficiently by bicycle.

Making the ride to bus stops more convenient will enhance multi-modal trips. (Note: The Transit Plan as well as current Pine Country Transit operations encourage multi-modal cycling trips.)

The complete bikeways plan and map is shown on the Regional Bikeway System Plan. The Bikeway System Plan identifies corridors that may include one or both of these two facility types: Type I and Type II.

Type I facilities are the Bike Paths. These are non-motorized multi-use paths, parallel to and near streets. Often in the street right-of-way or adjacent easements, they are paved and wide enough to accommodate moderate volumes of mixed bike and pedestrian traffic. They are designed for basic riders and children ('B' and 'C' cyclists) and provide direct connections between distant points and major system nodes while providing lateral separation from vehicular traffic.

Type II facilities are the Bike Lanes. On city streets, these are lanes marked on the pavement and identified by signs and pavement markings for exclusive use by cyclists. On state highways, Type II facilities are roadway segments with either adequate curb lane width so that motorists do not need to veer into the adjacent lane in order to pass a cyclist, or edge lines marking a paved shoulder 4 feet or greater in width. Specific bike signing and pavement markings are not used on the state highways. Type II facilities are intended for the more advanced 'A' cyclists and are the routes most often used for commuting trips.

Bicycle Facilities in the County

The existing and proposed bikeways systems reside primarily within the city. Exceptions are the highways leaving the city—US 89, AZ 89A, US 180 and Lake Mary Road—which have proposed or existing Type II facilities. The *Regional Plan's* street functional classification definitions for arterial and collector streets provide a structure for the County to use in establishing design standards that encourage alternate modes of travel within and between county areas and the city. Circulation within unincorporated areas in the county is addressed through the area plan process. Linking these areas to the city network is a goal of the *Regional Plan*.

THE RAILROAD CORRIDOR

The mainline railroad corridor (Burlington Northern/Santa Fe) through the core of the urban area represents a major local condition affecting mobility in the Flagstaff area. The only separated street crossing of the rail corridor within the core of the area occurs at the point that Milton/Route 66 curves to the east.

Train traffic through the corridor varies between 60 and 85 trains per day depending on the season. The trains are getting longer (a national trend) and can be over a mile long. On their way through Flagstaff they may block specific crossings for as little as a minute and a half or as much as three and a half minutes. The trains not only block intersections, but they also affect the timing cycles of traffic signals. It may take five to ten minutes or even more for the effects of a train passing through town to clear up and the flow of traffic to return to “normal.”

Generally, rail freight grows in proportion to the national economy, increasing during boom times and shrinking during recessions. Over the next twenty years or so, Flagstaff can expect to see freight traffic grow at a long-term rate of about 1% to 2% annually. While continued consolidations and reorganizations in the rail industry will affect rail traffic in a general way, these factors are unlikely to affect the amount of train activity through Flagstaff, since this line represents one of the few remaining major east-west cross-country rail corridors.

This corridor is also an important AMTRAK route. Flagstaff is one of a dwindling number of US cities with an active passenger rail station served by inter-city rail operations. About 200 passengers a day board AMTRAK in downtown Flagstaff. While the future of AMTRAK as an entity is uncertain, it is likely that the demand for rail passenger service to vacation/recreation destinations will increase over coming decades as the baby boom generation retires. As the National Park Service pursues the “de-automobiling” of the Grand Canyon’s south rim, the stage will be set for more people to think of coming to visit by means other than their automobiles, and AMTRAK will be an attractive choice for many of them.

Alternatives for reducing the impact of the rail corridor on mobility in Flagstaff include:

- Build a new mainline freight corridor; reroute through-freight traffic out of Flagstaff.
- Lower the grade of the railroad through the downtown area and build structures to carry major streets across.
- Elevate the railroad on structure and berm through downtown area.
- Leave railroad where it is and build grade crossings for two or three major streets.

A study of these alternatives suggests the separated grade crossing to be the most cost-effective and constructable.