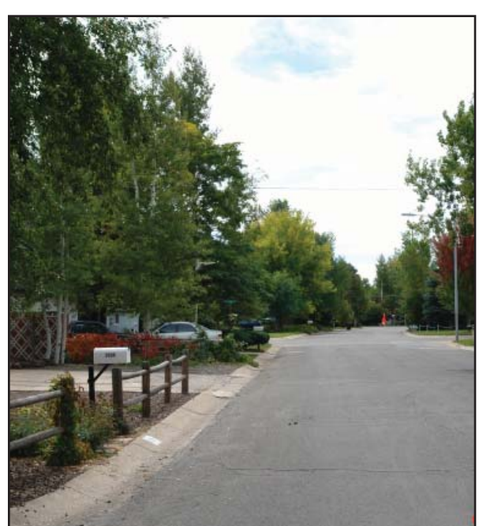
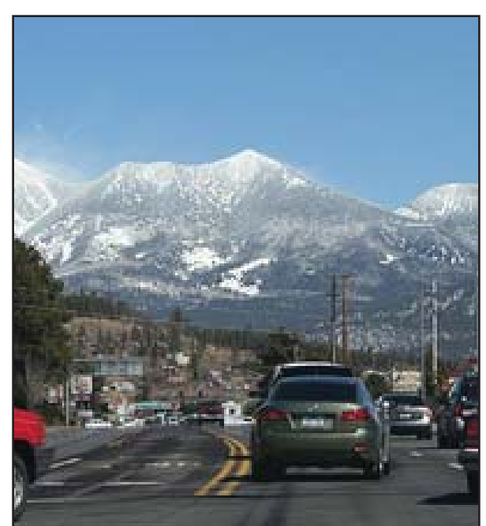
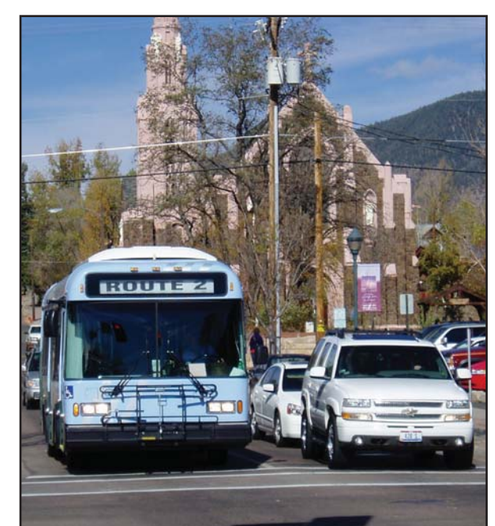
Flagstaff Metropolitan Planning Organization
Flagstaff Pathways 2030 Regional Transportation Plan

Final Report December 2009







Acknowledgements

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This FMPO Regional Transportation Plan Update was adopted by the FMPO Executive Board on December 16, 2009.

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**** Note: Document reads best in 11x17 flip-chart format, bound at the top ****

Introduction

The Flagstaff Metropolitan Planning Organization

The Flagstaff Metropolitan Planning Organization (FMPO) is the federally-recognized regional transportation planning organization for the Flagstaff area. Established by intergovernmental agreement and designated by the Governor of Arizona in September 1996, its membership includes Coconino County, the City of Flagstaff and the Arizona Department of Transportation. The FMPO is responsible for multimodal transportation planning within the 525 square mile area shown in the map below – from Bellemont to Winona and from the San Francisco Peaks to Kachina Village and Mountainaire.

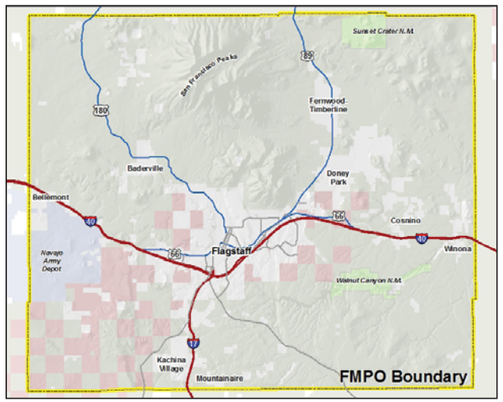


Figure 1 - FMPO Boundary

The FMPO is charged by the Arizona Department of Transportation and the US Department of Transportation with preparing a Long Range Transportation Plan. This document, "Flagstaff Pathways 2030," fulfills that mission and is effective pending approval by the state and federal governments.

Flagstaff Pathways 2030

Flagstaff Pathways 2030 is the Flagstaff MPO's Regional Transportation Plan (RTP). The RTP identifies and prioritizes future transportation investments for the Flagstaff region for driving, riding the bus, walking, biking and goods movement. A federal and state requirement to receive transportation funding, the RTP evaluates the cost and effectiveness of projects for each major travel mode, as well as addressing the relationships between land use, transportation, the economy, and the environment.

The RTP has a regional focus corresponding to the FMPO's planning area shown above. Accordingly, the RTP addresses transportation facilities at a very broad level while deferring to local jurisdictions for the details of local streets, sidewalks, and other small- and specific-scale issues.

The policies of the FMPO Regional Transportation Plan (RTP) Update reflect a commitment to current regional land use policy reflected in the Flagstaff Area Regional Land Use and Transportation Plan. These land use policies, confirmed through extensive public outreach and discourse within the FMPO Board and Committees include preserving the natural environment and improving the built environment through compact, infill, and activity center development.

The City and County are cooperating in the update of the Flagstaff Area Regional Land Use and Transportation Plan. This effort, known as the Regional Plan 2012, is scheduled to conclude in late 2011. FMPO is heavily engaged in that process and will amend this RTP to appropriately respond to any changes in land use policy. The RTP will be updated on a 5-year cycle from that point on while regional land use plans will be updated on a 10-year cycle.

Flagstaff Pathways 2030 – Highlights

- Meets state and federal requirements for transportation planning (Appendix J).
- Employed extensive public involvement process, which prioritized community and neighborhood preservation, environmental access and protection, multimodal investments, and capacity additions in certain circumstances (Appendix A).
- Integrates land use, character and transportation by relating investments by travel mode to activity centers and area type.
- Identifies transportation facility needs to support existing land use policy.
- Land use plans needing further scrutiny:
  - Number, size and priority of activity centers related to market viability
  - Size , number and capacity of special districts exceeds the projected employment needs of the region
  - Proposed development patterns create demand for newly planned "conditional" roads, many of which conflict with stated open space intentions
- Prioritizes project funding and programming through criteria-based evaluation.
- Finds that only eight road projects can be funded with current revenues, though future bond measures, developer improvements, grants and state funding may add to that list.
- Roadway project and transit service needs exceed $1.1 billion.

The extensive community and stakeholder engagement program reached more than 1,000 unique individuals using methods to satisfy federal requirements in the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), and ensures broad input at all levels to strengthen the plan. The effort consisted of stakeholder focus groups, public workshops, input opportunities at public events and fairs, on-line surveys, media outreach, a dedicated project website, and neighborhood association feedback sessions. The process deliberately engaged a broad cross section of residents, businesses, interest groups and transportation users at a variety of locations using visualization and other techniques. (See Appendix A)

Several common themes were identified during the process. Participants highly rate the existing transportation system, noting recent and ongoing project and service investments. There is a strong desire to increase travel choices and routes, particularly north-south travel, in a way that protects residential neighborhoods and preserves environmental quality and access. Given the region's constrained topography, there is some debate over when and where it is acceptable to build wider roadways when other preferred options, such as increased connectivity, may not be feasible.

Policy Foundation

Another important outcome was community support for and affirmation of mixed use activity centers at appropriate scales and locations as a planning strategy to link transportation, land use, and community character. Accordingly, this RTP emphasizes the activity centers strategy in determining investment suitability and priorities by travel mode. This approach builds on current and adopted policies addressing activity centers in future land use planning.

The results of this outreach and discourse recommend the following transportation policy foundation and purpose statements upon which RTP policies and objectives shall rest.

Foundation Statement

Our transportation system will coordinate with envisioned land use to support a sustainable economy, a livable community, and a preserved and protected environment in accordance with the Flagstaff region's core values and vision for the future.

RTP Policies and Primary Objectives

1. Maximize personal mobility by providing balanced travel choices (drive, bus, walk, bike) that maximize safety and security for transportation users and the region as a whole.
2. Reduce greenhouse gas emissions and optimize existing infrastructure before adding more.
3. Fund transportation projects and facilities that support and enhance neighborhood and community character, environmental sustainability, safety, and the region's economy.
4. Serve all three elements of mobility: access (local), circulation (between neighborhoods and activity centers), and travel (regional).
5. Integrate transportation decision-making with long-range local and regional land use planning.

Transportation Strategies

The following RTP transportation planning strategies apply to all areas and modes:

1. Apply a context sensitive solution to all investments.
Context-Sensitive Solutions, or CSS, is a way of designing and building transportation facilities and infrastructure to seamlessly reflect and minimize impacts to adjacent land uses and environmentally-sensitive areas. A CSS project complements its physical and natural setting while maintaining safety and mobility. Such projects result in transportation facilities that reflect community values based on the input of designers and stakeholders and are integrated with surrounding land uses. A critical element of context sensitive solutions is "green streets," specifically the use of low-impact development (LID), eco-system based design strategies to manage stormwater, minimize its environmental disruption, and minimize "end-of-pipe" treatments. LID can enhance the local environment, protect public health and sustainability, and improve community livability. LID strategies can also save developers and local governments time and money – both upfront and over time.

2. Strive to implement complete streets.
"Complete Streets" are streets, roadways, and highways that are designed to safely and attractively accommodate all transportation users: drivers, bus riders, pedestrians, and bicyclists. Travelers of all ages and abilities can safely move along and across a complete street.

Complete streets increase personal mobility and play an important role in managing traffic flow and reducing vehicle congestion. As with CSS, complete streets also address access management opportunities.

3. Optimize connectivity for all modes.
A well-connected street grid diffuses traffic along multiple routes rather than concentrating traffic within one or two major corridors. Multiple travel routes provide greater mobility for driving, walking, and biking, and help reduce congestion. Without multiple access points, residential traffic is concentrated at a limited number of locations, causing significant congestion, wide roads and intersections, and higher vehicle speeds, all of which are unsafe for drivers, pedestrians, and bicyclists.

4. Maximize personal travel choices.
Providing residents, visitors, workers, and employees with a range of travel mode choices and strategies is key to social equity, sustainability, active living, economic competitiveness, and other personal and regional benefits. Supportive smart growth land use and urban design policies expand personal travel choices. Transportation demand management (TDM) strategies – particularly for employees- also increase personal mobility through transportation allowances, carpool incentives, transit passes, and other TDM strategies. Finally, this approach sets mobility policy expectations for land use decision-making to focus on mobility for people and all transportation system users, not just cars.

When the RTP's policies, objectives, and strategies seemingly conflict in considering or evaluating specific transportation investments, particularly roadway projects, the RTP offers the following guidance. The criteria below were developed from the public outreach process. Criteria weights are based on a constant-sum-paired comparison exercise conducted with project stakeholders and the FMPO Executive Board, and with input from the MPO's Technical Advisory Committee. Each criteria was paired against another and a constant score split between them based on their relative value. Please see page 34 for a more complete explanation of the criteria components.

Table 1: Policy Tradeoffs Prioritization

Policy Guidance	Criteria (All Area Types)	Criteria Weight
Policy tradeoffs for the location, design, and objectives of roadway investments	Road Maintenance & Ops.	1.51
	Increase Safety	1.51
	Community Character	1.41
	Economic Development	1.34
	Environment	1.33
	Reduce Duration of Trips	1.33
	Expand Mode Choices	1.28
	Reduce Number of Trips	1.25

Strategies & Objectives

Transportation System Purposes

I. Transportation support for the Economy

Our economy is based on tourism, government/education, retail & services, medical products and health services, and emerging green and high-tech industries.

A. To support all of these sectors, the transportation system must...
1. provide a range of affordable transportation choices for the work force to facilitate employee recruitment and retention
2. provide access to work force housing and essential daily services:
3. provide access and facilitate travel flow within and outside the region for customers – including tourists, goods, services, and freight
4. be scaled appropriately for the area and use
5. perform safely for customers, clients, haulers, and employees

B. To support tourism, the transportation system must...
1. be easy to understand and navigate
2. provide viable alternatives to auto travel with safe and seamless intermodal connections
3. enhance, and not detract from, our region's beauty
4. provide access to our cultural and natural attractions

C. To support government/education, the transportation system must...
1. provide safe, affordable, attractive choices for students and faculty mobility and for access to major events
2. be accessible to government clients and customers, particularly the disadvantaged
3. be cost effective and a good value for citizens

D. To support retail and services, the transportation system must...
1. respond to the range of markets served, global to local
2. balance the right volume and mix of customers, trip choices and traffic

E. To support regional medical services, the transportation system must...
1. provide safe and effective access and mobility for emergency medical vehicles

F. To support bioscience and medical product research, and high tech development and manufacturing, the transportation system must...
1. provide and maintain ready access to air services and Pulliam and major southwest airports
2. maintain convenient access to high capacity shipping and distribution networks
3. facilitate a secure environment and related services like hazardous materials handling

G. To support current and future heavy manufacturing, the transportation system must...
1. provide viable choices for shipping and receiving
2. provide facilities designed to handle needed delivery vehicles

II. Transportation support for the Environment

Our environmental values include healthy ecosystems, forests and wildlife habitats and maintaining access to the natural environment.

A. To support healthy forests and wildlife habitats, the transportation system must...
1. align infrastructure (roads, bikepaths, etc.) with respect for terrain, drainage, and wildlife needs to avoid fragmentation of ecosystems
2. reduce pollutants that impact air and water quality through best practice design and operations
3. encourage infill development to most efficiently utilize existing infrastructure and utilities

B. To maintain access to our natural environment, the transportation system must...
1. enhance access, but not overexpose natural resources
2. increase and enhance non-motorized access to natural areas

III. Transportation support for Community Character

The region's community character is defined by its common identity, natural setting – including protection of landscapes and views, and small-town charm – epitomized by the historic downtown, distinct neighborhoods, and urban and rural open space. Within this physical space, our residents value diversity, family and households, health, education, arts & culture and the relationships they support.

A. To establish a common identity reflective of our culture and heritage, the transportation system must...
1. possess gateways and corridors with aesthetic and architectural features reflecting Flagstaff's unique heritage
2. provide opportunities to display and encounter art

B. To sustain small-town charm, the transportation system must...
1. be scaled appropriately
2. support trip-making where social exchange may take place
3. provide access to urban open spaces and physically define them when appropriate
4. provide well-landscaped, attractive facilities and infrastructure
5. provide a variety of access to the downtown
6. be sensitive to historic and prehistoric sites and buildings

C. To support landscapes and views the transportation system must...
   1. create opportunities for views
   2. incorporate elements that complement our landscapes and views

D. To create and maintain distinct neighborhoods, the transportation system must...
   1. balance mobility, access, and trip choice to the needs and design of each neighborhood
   2. create access to basic services: jobs, shopping, recreation, worship
   3. Support the development and evolution of activity centers identified with a neighborhood or neighborhoods

E. To support diversity, the transportation system must...
   1. be accessible to all residents
   2. distribute positive and negative impacts equitably

F. To support healthy families and households, the transportation system must...
   1. be sensitive to the costs of travel, both time and money
   2. provide for safe and appealing urban and rural settings
   3. limit impacts to air and water quality

Transportation Mobility and Land Use Planning Guidance

Introduction

Within the complex relationships between transportation and land use is the simple concept that how and where we live influences how we travel. Put another way, travel choice options and investments depend on land use and community character.

Development patterns inherently influence, if not dictate, travel behavior. Jobs and housing located far apart and connected only by highways or freeways result in long commutes by car. Shops or employment located close to housing encourages walking, biking, and transit use in addition to driving. Research locally and nationwide indicates that neighborhoods integrating housing, shops, offices, and educational and recreational opportunities in a compact, well-designed way can increase personal mobility while reducing vehicle congestion. Such land use strategies are not meant to force drivers from their cars, nor to negatively impact existing stable neighborhoods. Rather, applied at strategic locations and thoughtfully over time, these strategies are intended to maximize personal travel choices and mobility, reduce the need to always drive long distances for every trip, and to provide the region with as many transportation options as possible to address new growth over time.

The RTP Update recognizes that land use planning is a transportation strategy. The RTP seeks to provide policy and programming guidance regarding context-sensitive transportation investments. Through defining "mobility-supportive" land use patterns and the multimodal transportation design characteristics appropriate in each land use context, the RTP serves as a tool for transportation and land use planning, programming, and decision-making.

Existing and Future Conditions

Demands of the existing population base on the transportation system resulted in many recent improvements. The Highway 89 traffic interchange was recently reconstructed, and the Fourth Street railroad overpass and connection was also recently completed. Miles of trails and bike lanes have been constructed and the region recently (May 2008) passed several 10-year sales tax ballot measures to fund and significantly expand transit service. Consequently, the Flagstaff region's transportation network performs very well, and is rated highly by residents, stakeholders, and other users.

Yet, major transportation issues and challenges remain. These include Milton Road congestion, limited access to downtown, railroad crossing congestion, Northern Arizona University related traffic, parking access and supply (especially downtown), and improving pedestrian, bike and transit levels of service in existing areas. Safety is a concern also. Appendix B also summarizes a comprehensive safety analysis undertaken as part of this RTP.

Tables 2 through 4 summarize existing and projected demographic and transportation conditions for the region. There is a striking difference in projections. Earlier expectations had the region reaching 103,000 population by 2020, a level now projected for 2030. The scale, location and pace of growth have implications for transportation. Scale influences the number of trips generated. Location effects whether trips can be made by walking, biking or other means. Pace is related to the timing of construction and can also affect the cash-flow that may help pay for it.

Development trends applied to the projections in Table 2 and in compliance with land use plans assume residential growth on the periphery of current development. This includes areas near Woody Mountain Road, east of Coconino Community College on Lone Tree Road, and dispersed development in the unincorporated areas of the region. Major shopping expansion at the Flagstaff Mall is relatively distant from much of the population and absorbs much of the retail demand into the future. Consequently, new trips are longer and often made by car.

Table 2: Population and Employment - FMPO Region

	1998 (1)	2007 (2)	Previous 2020 (3)	2030 RTP (4)	2050 (4)
Regional Data					
Population	68,500	79,383	103,743	103,621	117,674
average annual growth rate		1.8%	2.4%	1.3%	0.7%
City	56,420	63,551		83,746	96,418
County	12,081	15,832		19,875	21,256
Employment	31,000	36,815	n/a	53,969	63,265

(1) Data from Census and/or staff estimation.
(2) Data from Arizona Department of Commerce and staff estimation.
(3) Data from Flagstaff Area Regional Land Use and Transportation Plan.
(4) Data from Arizona Department of Commerce and staff estimation.

Transportation & Land Use Guidance

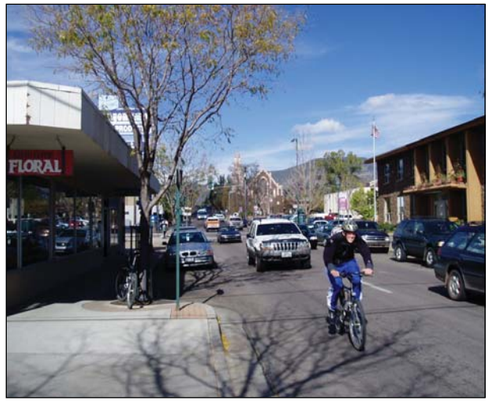
Trend is not destiny and implementing these RTP policies will have a positive result on community character, the economy and the environment. Table 3 shows that existing urban form already influences trip-making behavior. Higher density and mixed-use in the downtown clearly result in more people walking and biking. Transit service in the downtown was limited at the time of the survey.

Table 4 highlights the effects of different investment strategies - increasing the amount of roads, pedestrian and bicycle facilities or transit service and of pursuing activity center development. Maps depicting roadway congestion under some of the different conditions are also provided. The data come from the FMPO regional transportation model.

This model uses housing patterns, employment types, densities, and levels of service for transportation systems to estimate travel demand and patterns. The model has proven accurate for smaller areas in the region and can be considered reliable for regional patterns. Appendices C and D illustrate some of the population assumptions and model results.

Clearly, targeted investment and land use patterns influence trip behavior, but changes in overall behavior are modest. First, because total growth is modest trip behavior changes little. Second, the assumed shift into activity centers is also small, meaning relatively few new residents would be influenced by higher walk, bike and transit levels of service in these activity centers. Third, on a percentage basis, the region made very large strides from 1998 to 2007 in the provision of walk, bike and transit services. Moving forward, gains will be smaller on a percentage basis.

The 2030 activity center scenario envisions a shift of 18% of future residences from the periphery into activity centers and 8% of future businesses from strip centers into the activity centers. Although there is higher density, the vehicle hours of travel – congestion – goes down. The 2050 activity center scenario has 37% of new housing between 2030 and 2050 and 11% of business going into activity centers while transit and pedestrian service continues to climb. Again, growth and land use change increases the demand for all types of transportation facilities. Note that the presence of conditional roads in 2050 now decreases vehicle miles of travel where in 2030 it resulted in an increase.



Future land use planning, beginning with the Regional Plan 2012, will ultimately set these land use policy decisions. To achieve a greater shift of trips from cars to walking, biking and transit even more emphasis should be made on bringing people and services together by:

1. Increasing the density of activity centers;
2. Increasing the balance of jobs and housing within those centers;
3. Increasing the level of transit service to those centers; and
4. Improving the pedestrian environment accessing the transit service.

Flagstaff also enjoys favorable attitudes towards the environment and healthy lifestyles. Educational campaigns accompanied with incentives to walk, bike or ride transit should prove effective in shifting even more trips to these modes.

Finally, the regional model does not make assumptions about several large-scale, global trends that could also drive up participation in walking, biking and transit use. These include oil supply and the cost of gasoline, climate change and any related costs to transportation, and water supply that may influence development patterns.

Table 3: Existing Conditions - FMPO Region

Travel Mode	Geographic Region			
	Core: Downtown & NAU	Rest of Flagstaff	Rest of Region	Entire Region
Car	71%	77%	95%	78%
Pedestrian	17%	12%	4%	12%
Bicycle	11%	8%	1%	7%
Transit	1%	3%	0%	2%
Totals	***100%***	***100%***	***100%***	***99%***

Source: Flagstaff MPO Trip Diary Survey, May 2007.
Survey results indicate transit ridership is over-reported.

Transportation & Land Use Guidance

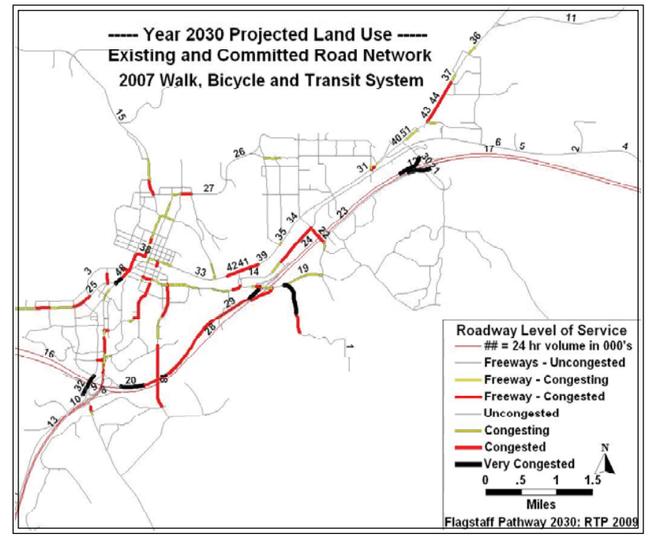
Table 4A: Comparing System Performance Under Scenarios					
	Condition				
Measure	2007	2030 Trend Development & Financial Constraint (1)	2030 Trend Development, All Roads & Limited Alternate Modes	2030 Trend Development, All Roads & Full Alternate Modes	2030 Trend Development, No Conditional Roads & Full Alternate Modes
Total Person Trips	603,149	823,184	823,165	821,332	821,332
Vehicle Hours Travel	63,957	119,482	111,830	110,457	112,334
Vehicle Miles of Travel	2,329,284	3,373,327	3,351,534	3,317,318	3,313,372
Mode Share - Internal Trips Only					
walk/bike	10.85%	10.40%	10.40%	11.48%	11.46%
transit	0.32%	0.22%	0.22%	0.76%	0.79%
vehicles	88.83%	89.39%	89.39%	87.76%	87.75%
VMT/Capita	29.5	32.8	32.5	32.2	32.2
VHT/Capita	0.8	1.2	1.1	1.1	1.1
Percent Growth by Mode (2007 - 2030)					
walk/bike		-4.2%	-4.2%	5.9%	5.7%
transit		-32.8%	-32.8%	135.3%	145.7%
vehicles		0.6%	0.6%	-1.2%	-1.2%

(1) Future funding provides so little new service that the existing conditions model is used to represent the financially constrained condition.

(2) This scenario is for illustrative purposes and represents a shift of approximately 18% of residential and 8% of commercial into select centers.

Table 4B: Comparing System Performance Under Scenarios			
Measure	2030 Activity Center Development, All Roads & Full Alternate Modes	2050 Activity Center (1) Development, No Conditional Roads & Full Alternate Modes	2050 Activity Center Development, All Roads & Full Alternate Modes
Total Person Trips	819,790	1,004,290	1,004,289
Vehicle Hours Travel	109,603	196,617	192,030
Vehicle Miles of Travel	3,227,929	4,353,466	4,340,315
Mode Share - Internal Trips Only			
walk/bike	12.12%	11.97%	12.06%
transit	0.76%	1.65%	1.65%
vehicles	87.12%	86.39%	86.29%
VMT/Capita	31.3	37.2	37.1
VHT/Capita	1.1	1.9	1.9
Percent Growth by Mode (2030-2050)			
walk/bike	11.7%	-1.3%	-0.5%
transit	135.1%	117.4%	117.2%
vehicles	-1.9%	-0.8%	-1.0%

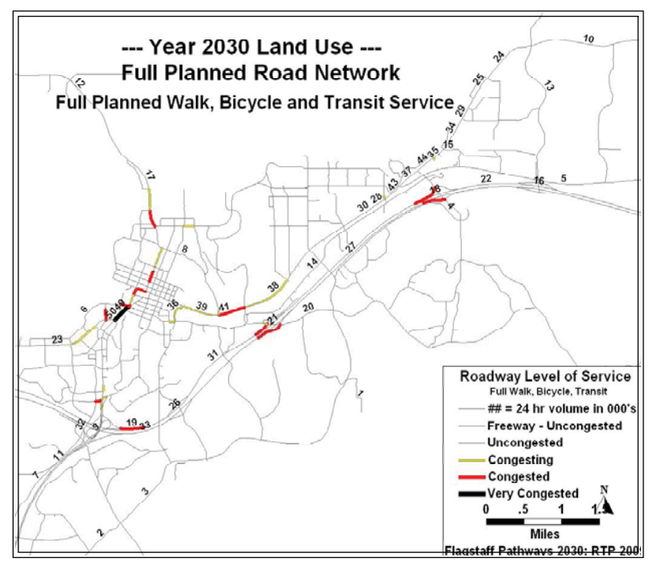
(1) This scenario is for illustrative purposes and represents a shift of approximately 37% of residential and 11% of commercial into select centers between 2030 and 2050.



By 2030, regional population increases by more than 20,000. Growth occurs in areas on the edge of existing development south of I-40, near Woody Mountain Road and elsewhere.

Under the financial constraint condition, few new roads are assumed built or widened. No improvements to walk, bike and transit conditions occur. Taxes exist to nominally expand walk, bike and transit service and developers will build or improve some roads.

Congestion – similar to downtown today - occurs on all roads leading into town and on the interstate.

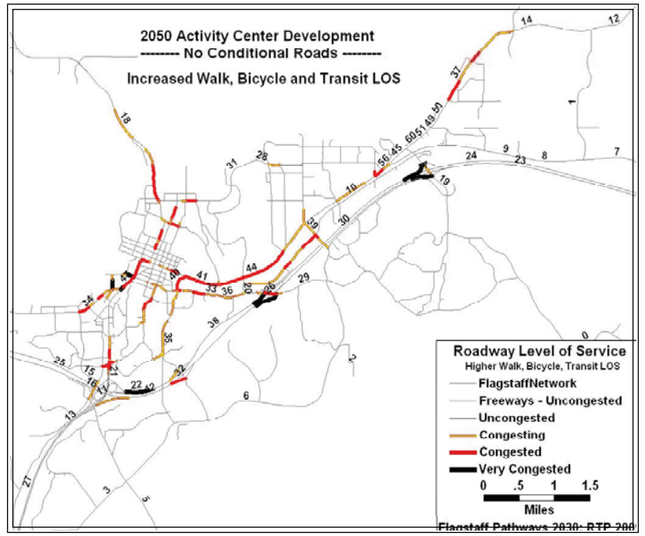


Adding new roads, widening some – like the interstates -- and expanding walk, bike and transit services per the maps in this plan addresses many congestion issues.

A similar congestion pattern occurs in the 2030 Activity Center condition when some growth is shifted to activity centers. This creates small reductions to vehicle hours and miles of travel suggesting the activity centers are a practical way to manage growth.

Funding for all of these solutions is not available by 2030. However, demand for roads like J.W. Powell may come later than 2030 and other funding sources may come available.

Transportation & Land Use Guidance



In 2050, the population is 117,000. Here, conditional roads are not modeled causing congestion on US 89 and Lone Tree. In the tables, see that in 2030 these roads actually increased vehicle miles of travel. In 2050, new areas without the conditional roads require longer trips (more vehicle miles traveled).

Growth is divided between centers like N. Fourth Street and areas like south of Little America. Activity centers (assuming shifting modest growth to them) and more transit lessen congestion downtown, on campus and Fourth Street when compared to a condition with no shift in development patterns and 2030 levels of walk, bike and transit.

Land Use Policy and Activity Centers

It is the RTP's policy to encourage and promote land use decisions that maximize personal mobility and travel choices through activity centers that contain locally-acceptable densities, a complementary mix of "origin" and "destination" land uses, an urban design and form that clusters uses in close proximity, and a well-connected transportation network that incentivizes safe and convenient driving, transit, walking, and biking.

Working within current policy guidance in the Regional Land Use and Transportation Plan, the RTP formulates a series of rural, suburban, and urban areas and their respective activity centers across the region, with potential transportation investments directed within and between activity centers. These area types are mapped by traffic analysis zones (TAZs) which do not always correspond to land use planning geography, so judgment may need to be applied, particularly at the TAZ borders. The RTP states a preference for traditional neighborhood development (TND), with the implication that greenfield development is presumed to have a higher level of urbanity, such as a more-concentrated mix of complementary land uses and higher densities than in surrounding areas (see Table 7).

Generally speaking, activity centers:

- Range in size according to their service area: neighborhood (not addressed in the RTP), district, community, and region. Employment centers are special activity centers concentrating employment in one or more activities such as office, medical services, or manufacturing.
- Activity centers should trend over time toward more density, greater mixes of use, and a more traditional form of development to better facilitate economic activity and mode shift.
- Prioritization of investments in activity centers should consider redevelopment goals and the proximity of the center to a planning criteria threshold (Appendix E) or the next mobility service level, as well as the presence of schools and parks.
- Finally, larger or more intensive activity centers also serve the functions of smaller and less intensive centers. For example, a Community activity center may also serve the functions of a District and Neighborhood center for the surrounding areas.

Area Types

Area types and activity centers are detailed in tables 5 through 7 and are described as follows:

Rural - Large areas of contiguous, low-density housing of 2.5 acres or more per dwelling unit, interspersed by larger areas of public use open space or agricultural lands. Rural land use is typically unincorporated and under the jurisdiction of the County. Communities are regularly, though not universally, exemplified by the keeping of large or small livestock and evidence of outdoor pursuits such as hunting, hiking, boating, camping, off-roading, and collecting firewood.

Suburban - Typically residential areas surrounding the dense core(s) of a city or town characterized by densities between three and seven units per acre, supported by occasional low intensity retail and service establishments along high travel corridors.

Urban - The dense, often multi-story, mixed use core or cores that serve as the focal points for cities and towns. These are often the seat of local government, financial, and cultural and social centers for the surrounding community due to the face-to-face interactions made possible by the density and diversity of activity.

Table 5: Activity Center Distribution and Guidelines (1)

Center Type	Size (acres)	Service Area Miles (radius)	Percent Residential	Residential Density	Service Population	Total for 80k pop.	Total for 103k pop.
Crossroad (2)	Parcel	3 to 5	n/a	n/a	varies	n/a	n/a
Rural	10 to 20	1 to 5	0-15%	5-10	varies	n/a	n/a
Neighborhood (2)	2 to 4	3/8 to 1/2	20%	12	5,000	16	21
District (3)	7 to 15	3/4 to 1.5	10%	16	10,000	8	10
Community (3)	20 to 40	3 to 5	5%	25	60,000	1	2
Regional	40 to 300	10 to 50	5%	25	80,000	1	1
Institutional (4)	5 to 100	3 to 4	0%	n/a	varies	n/a	n/a
Employment/Special District	300 to 600	10 to 50	2-5%	n/a	120,000	1	1

(1) Flagstaff's centers will generally serve smaller populations than centers within larger metropolitan areas
(2) Crossroad and Neighborhood Centers are "corner stores" serving an immediate population with convenience items. Both are recommended by policy but too small to address individually at a regional scale.
(3) The terminology for "District" and "Community" centers is interchangeable in the literature. The RTP considers "District" smaller.
(4) "Institutional" center is not found in the literature. In TND practice, these activities are integrated with other center activities.

Activity Centers

Crossroads - A near singular commercial or cultural activity located in a rural area providing residents located far from larger commercial activities a shorter trip to obtain convenient access to goods or services. An example is Mountain View Store at Townsend-Winona Road/Lumberjack. "Hamlet or Clustered Land Development"

Rural Activity Center - A collection of two or more commercial activities located in a rural area that serves both regional residents and pass-by traffic. Such a center usually has the ability to expand in intensity and diversity of activity that may include residential development. An example is the Bellemont Truck Stop. "Hamlet or Clustered Land Development"

Transportation & Land Use Guidance

Neighborhood Activity Center - A suburban or urban counterpart to the rural crossroads, these small centers serve the immediate neighborhood (often understood in Flagstaff as one or more subdivisions) with convenience goods and services. Pass-by traffic a secondary part of their market. Example: O'Leary Street Market. "Village or Traditional Neighborhood Development"

District Activity Center - These centers contain a diversity of retail, office and service uses often including a grocery store. Residential uses are an integral part of these developments. They serve a collection of neighborhoods over a fairly large and well-defined part of the region often bordered by major roadways or important topographic (i.e., McMillan Mesa) features. Example: Cedar Safeway Shopping Center. "Village or Traditional Neighborhood Development"

Community Activity Center - A large center often anchored by a larger retailer (i.e., Wal-Mart) and intended to serve residents of all districts within the entire community. Often accessed by the larger roadways in the region. Example: Wal-Mart/Woodlands Village Shopping Center. "Transit Oriented Development"

Regional Activity Center - These areas provide services to residents and visitors from beyond the community and regional boundaries. They are, in aggregate, of a large scale. Examples: Downtown Flagstaff, Flagstaff Mall. "Regional Center Development"

Institutional Activity Center – Generally, a collection of public or quasi-public activities, varying in size, purpose, and service area. Examples: Flagstaff High School/Middle School/Marshall Elementary/Thorpe Park. "Special Districts"

Special District Centers - These areas are usually dominated by a single use or type of use, are large in scale and concentrate significant amounts of employment. Table 6 describes these areas. Note how much employment capacity exists. Examples: Northern Arizona University, Pulliam Airport Business Park. "Special Districts"

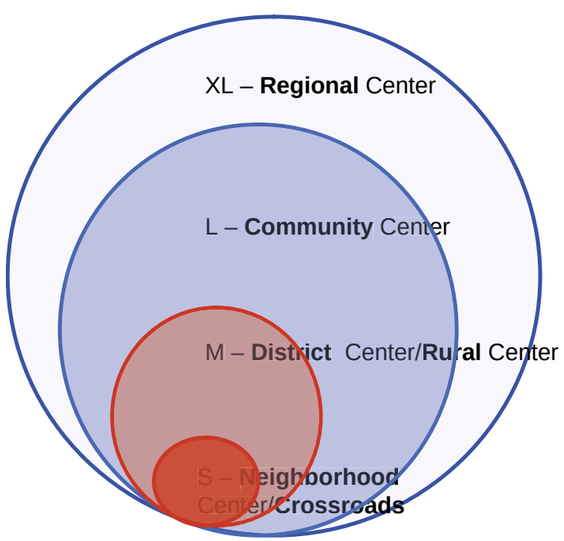


Table 5 and the accompanying map provide more detailed information regarding activity center characteristics and locations. Similar information for special districts is shown in Table 6. The component land use characteristics underlying the area types, activity centers and special districts are shown in Table 7. This table, which can be read both horizontally and vertically, shows the characteristics defining each activity center type, the components describing each land use element, the range of metrics to quantify these characteristics and components, and the priorities placed on broad modal categories.

City of Flagstaff Zoning Code Update –
The city's update is employing form-based codes - a regulatory system based on transects and associated with "New Urbanism." New urbanists call activity centers and their surroundings by different names. They are cross-referenced in "italics" at the end of each definition to establish the relationship between these efforts.

Travel Modes Intent

Tables 8 to 12 show specific relationships between transportation facility and service design and rural, suburban, and urban areas and their respective activity centers. More specifically, these tables indicate which types of facility (and transit service) characteristics and design are appropriate and ideal for each area type based on its component land use characteristics or context.

The maps accompanying the tables illustrate an initial application of these tools for each mode by area type. As shown in the maps, the application of each tool by mode (except roadways) uses the framework of "none" to "high" to provide specific mobility investment guidance by area type.

Roadway projects were evaluated using a "three step" process. First, a broad universe of conceptual projects was identified based on current and previous plans, public input, proposals, and ideas. These conceptual projects were then evaluated from a fatal flaw and reasonableness perspective to develop a set of candidate projects. These projects were then formally evaluated as described subsequently in this RTP to develop a "Needs Plan" set of projects (see pages 29-30 and Appendix F). Based on the evaluation process, candidate projects were recommended for inclusion, inclusion with conditions, or dropped from the Needs Plan. Finally, the Needs Plan project costs were then compared with 2030 revenue forecasts, per federal SAFETEA-LU requirements, to develop the final cost-feasible RTP.

Travel Modes Policy Statement

It is the RTP's policy that design standards and thresholds shown in Tables 8 to 12 represent minimum investment level targets for each area and activity center type. Where feasible, greater design standards and service supporting the RTP's policy foundation, primary objectives, and land use policy shall be implemented. Applying these greater standards should also consider redevelopment goals and the proximity of the area to a planning criteria threshold or the next service level. It is also the RTP's policy to support the locally-acceptable evolution of land use, neighborhoods, and activity centers over time to reach the next-highest level of transportation investment targets. The highest investment level may be reserved for a smaller area – perhaps a few blocks – at the core of the activity center. Investment level may then transition to the next lower service level as one moves away from the core.

Planned roadways not in the original Regional Land Use and Transportation Plan are deemed necessary or worthy of further study to support the mobility needs of planned land uses. Many also address issues raised during public input including the need for additional north-south and east-west arterials and a bypass of downtown congestion.

Facility Guidance, Policy Tables and Maps

Tables 8 through 12 on the following pages are accompanied by graphics and maps illustrating intended service and system treatments for the transit, pedestrian, bicycle and street modes of travel. The first table describes facilities for the mode. The following page illustrates those facilities. The next table identifies the expected level of service by area type. It is used in conjunction with the following map. This series is repeated for each mode. Remember "context sensitivity." A high level of service in a rural area is different from a high level of service in a suburban or urban area. The "Using the Tool" box associated with the level of service policy tables explains how to read the table and map together. Appendix E provides some of the analytical tools and additional planning guidance related to this section.

Facility Guidance, Policy Tables & Maps

Table 6: Flagstaff Regional Transportation Plan - Special Districts

Name	Camp Navajo	Flagstaff Ranch	Pulliam Airpark	N.A.U.	FMC/USGS	Industrial Dr.	Sheep Hill
Size (acres)	600	380	720	450	130	280	390
Area Type (surrounding)	Rural	Suburban	Suburban	Urban/Suburban	Suburban	Suburban	Rural
Urban Form (desired)	**unknown**	**conventional**	**hybrid**	**traditional**	**traditional**	**unknown**	**conventional**
Primary Activity	Industrial	Light Manufacturing	Light Manufacturing	Institutional	Institutional	Heavy Manufacturing	Heavy Manufacturing
Secondary Activities	Military	Warehousing	Warehousing	Residential	Research & Development	Light Manufacturing	Utilities
	Warehouse	Distribution	Distribution	Retail	Light Manufacturing	Distribution	
	Distribution		Office	Cultural	Office	Services	
			Research & Development	Research & Development	Residential	Wholesale	
Density (permitted F.A.R.)	**0.5**	**0.41**	**0.41**	**0.4**	**0.41**	**0.41**	**0.5**
Employment (capacity) (1)	26,136	13,600	25,700	4,300	4,600	10,000	17,000
Special or Priority Issues	Security	Integration with emerging residential areas	Integration with existing residential areas	Multimodal Access	Regional wayfinding	Track crossing safety	Environmental impact
			Parking and integration with other modes	Neighborhood Access			
	Separation of traffic streams		Access to bulk inputs	Regional wayfinding		Highway access	
Transportation Strategies	***See respective mode tables for details***						
Non-Auto Travel							
Transit	Commuter Express	Local: Intermediate	Local: Intermediate	Local: Frequent	Local: Frequent	Local: Minimum	None
Bicycle	Suburban: minimum	Suburban: moderate	Suburban: moderate	Urban: high	Urban: moderate	Suburban: moderate	Suburban: minimum
Pedestrian	Rural: minimum	Suburban: moderate	Suburban: moderate	Urban: high	Urban: moderate	Suburban: minimum	Rural: minimum
Roadways	*varies by specific location, uses, needs, challenges, and site context - see freight & goods priorities below*						
Freight & Goods							
Air	Indirect	Indirect	Direct	Indirect	Indirect	Indirect	Indirect
Highway	2nd Interchange	Woody Mtn. T.I.	I-17 Widening	Lone Tree T.I.		Industrial Drive paving	F-40 rebuild
		Woody Mtn. Connector	J.W. Powell	Lone Tree Corridor		I-40 widening	89 bypass
		I-40 widening	High Country Trail	Milton upgrade		Rte 66 upgrade	
Rail	Intermodal Yard					**Spurs/Sidings**	**Spurs/Sidings**
	Cross-dock						

(1) Based on acreage * floor area ratio * 2 employees per 1000 sq. ft.
(2) Based on local source data including the Northern Arizona University Master Plan

Facility Guidance, Policy Tables & Maps

Table 7: Area Type and Activity Centers Organization Framework

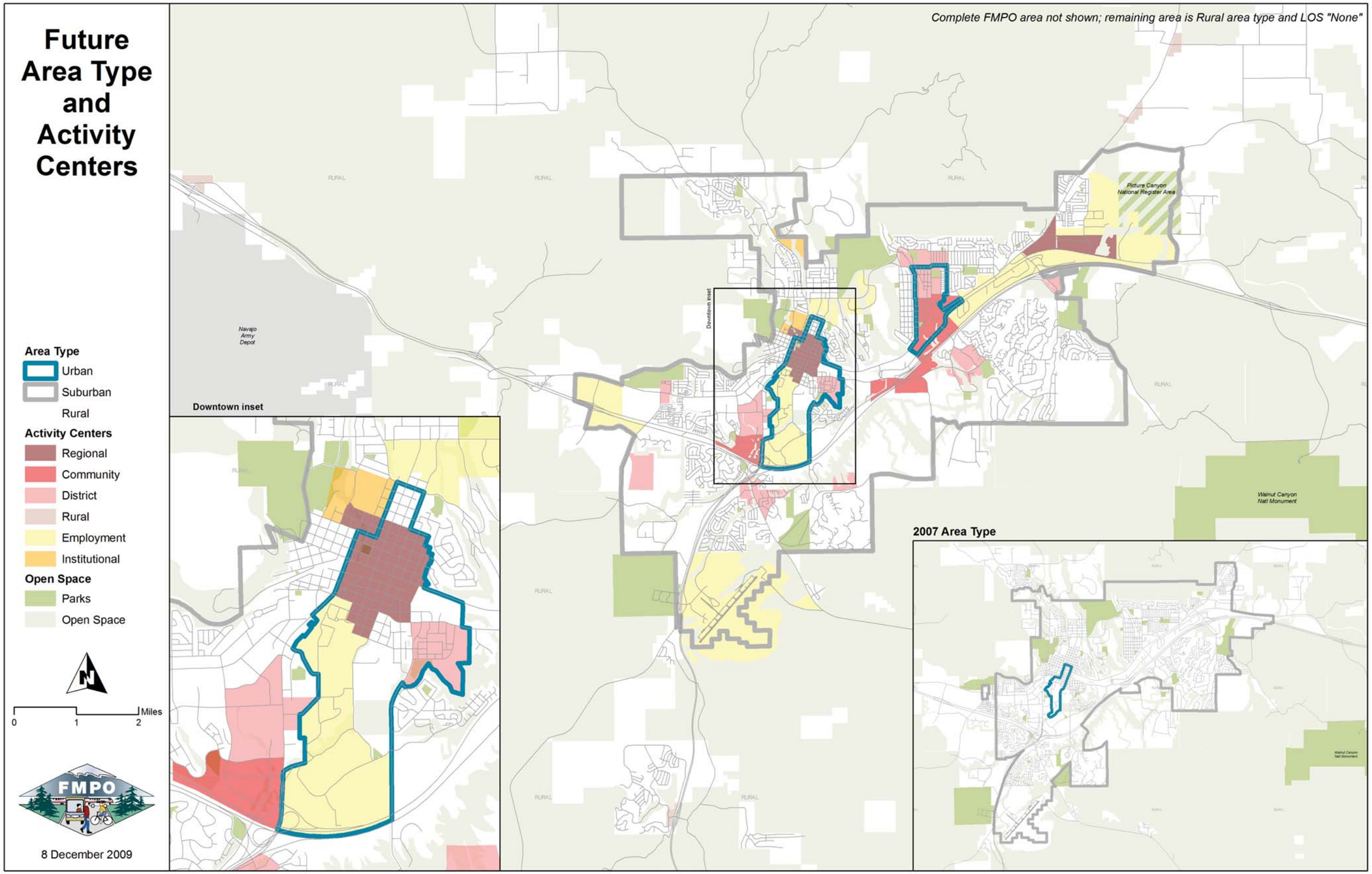
Land Use Component	Metric	Description (Range of Values)			
Area Type/Activity Center Development Character	*Description*	rural	suburban	urban	special district
	Definition	Areas of contiguous, low-density housing, interspersed by larger areas of open space or agricultural lands.	Primarily residential areas surrounding the dense core(s) of a city.	Dense, often multi-story, mixed use core(s) that serve as city focal points.	Areas predominated by a single use, large in scale, and significantly concentrated employment.
	Measurement	density, transect, policy designation			
Urban Form	*Description*	conventional	hybrid	traditional (TND)	unique
	Measurement	land use mix, density, lot size, connectivity, setbacks, unique facilities/infrastructure			
Land Use Mix	*Description*	single use	separate uses	mixed uses	unique uses
	Measurement	number, proximity, integration, compatibility of land uses, buffer from dis-similar uses			
Density	*Description*	low	medium	high	
	Measurement	units/area, floor-area ratio, lot size/coverage, bldg. height, transect			
General Mobility Investment Strategy	*Overall Strategy by Area Type*	minimum investment standard to ensure safety for all modes and traffic flow	moderate investment by mode to create travel choice opportunities	high investment by mode to maximize travel choices	investment customized to unique needs; economic & frieght/goods emphasis
	see tables by mode for specific mobility investment guidance				

Using the Tool

- Employs land use components to define character as a means to guide mobility investment strategies by travel mode.
- Defines land use components of area types and activity centers.
- Matrix can be read horizontally and vertically.
- Special districts include industrial/business parks, Pulliam Airport, and other unique land uses.
- “Suitability” for transit, bike and pedestrian investments improves within and across area types as mix and density increase.

Facility Guidance, Policy Tables & Maps

Map 1 - Future Area Type and Activity Centers



Facility Guidance, Policy Tables & Maps

Table 8A: Transit Service - Guidelines for Use *(see illustrations on next page)*

		Rural	Suburban	Urban
Transit Service Investments				
Non-fixed Route	(Includes transportation demand management, paratransit, park-and-ride, express bus, commuter route etc.)	• See Rural Service Matrix in Appendices	• See Rural Service Matrix in Appendices	
Local Bus (Fixed Route) Major Roads	Local fixed route (basic)	**Gray-shade: Service not applicable**	• 60 or longer, no peak service • min residential density (du/acre) - 4	
	Local fixed route (intermediate)		• 20-60 peak and off peak • min residential density (du/acre) - 7	• 20-60 peak and off peak
	Local fixed route (frequent)		• peak - 15 minutes or shorter • off peak - 60 minutes or shorter • min residential density (du/acre) - 12	• peak - 15 minutes or shorter • off peak - 60 minutes or shorter • min residential density (du/acre) - 12
B.R.T.	Bus rapid transit		• peak - 15 minutes or shorter • off peak - 60 minutes or shorter	• peak - 15 minutes or shorter • off peak - 60 minutes or shorter
Curb-side Factors				
Passenger Access			• ADA accessible sidewalks/pathways provided • access and land use coordination (connectivity)	• ADA sidewalks/pathways provided • access and land use coordination (connectivity)
Shelters			• boarding level requirement - 25 per day • major destinations/activity centers • place near end of bus stop zone along pedestrian facility	• boarding level requirement - 50-100 per day • major destinations/activity centers • place near end of bus stop zone along pedestrian facility
Seating			• set by transit demand, bus frequency, and transfers at stop	• set by transit demand, bus frequency, and transfers at stop
Bicycle Storage			• associated with commuter markets (suburban) • major destinations/activity centers • coordinate the location with existing on-site lighting	• major destinations/activity centers • coordinate the location with existing on-site lighting
Trash Receptacles			• standard	• may have higher need for context sensitivity
Route or Patron Information			• route name, stop, and general time information at all stops • route map and system information at all shelters	• route name, stop, and general time information at all stops • route map and system information at all shelters
Lighting			• provided at all shelters and access points	• provided at all shelters and access points
Street-side Factors				
Stop Spacing			• 600-2500 feet • typical spacing 1000 feet	• 300-1200 feet • typical spacing 600-750 feet
Bus Bays			• traffic speed is greater than 40 mph • traffic in the curb lane exceeds 250 vehicles during the peak hour • bus volumes are 10 or more per peak hour on the roadway • passenger volumes exceed 20 to 40 boardings an hour	• generally not desired in urban areas and activity centers
Bus Stops - Far side			• far-side intersection placement is best • Locate at signalized intersections so that gaps in traffic are created	• far-side intersection placement is best • Locate at signalized intersections so that gaps in traffic are created
Bus Stops - Near side			• Not preferred because of right turn conflicts and bus delay	• Not preferred because of right turn conflicts and bus delay
Bus Stops - Mid-block			• Only when associated with major activity center and safe crossing	• generally not desired or needed
Nubs			• reduce pedestrian crossing distance • best used along street with lower traffic speeds/volumes and in places with significant pedestrian activity	• reduce pedestrian crossing distance • best used along street with lower traffic speeds/volumes and in places with significant pedestrian activity

Transit Facilities

Rural Service (non-fixed route)

Fixed Route Service

Frequent Fixed Route Service

Bus Bay

Transit Shelter

Bicycle Rack on Bus

Bicycle Locker at Transit Stop

Route and Schedule Information

Bus Rapid Transit (Rail-equivalent bus service)

Streetcar

Light Rail

Commuter Rail

Facility Guidance, Policy Tables & Maps

Table 8B: Transit Service - Level of Service Guidelines

Level of Service	Rural	Suburban	Urban
None - *Areas of the county outside of Rural Activity Centers will receive no service, some isolated suburban areas will receive Dial-a-ride only*			
Minimum			
Transit Service Investment	• *commuter route, express bus, etc.*	• *commuter route, express bus, etc.* • *basic local fixed route*	• commuter route, express bus, etc.
Curb Side Investment		• bus shelters and stops	• bus shelters and stops
Street Side Investment		• bus bays, hubs, etc.	• bus bays, hubs, etc.
Moderate			
Transit Service Investment	• basic local fixed route • intermediate local fixed route	• *basic local fixed route* • **intermediate local fixed route**	• *intermediate local fixed route*
Curb Side Investment		• bus shelters and stops	• bus shelters and stops
Street Side Investment		• bus bays, hubs, etc.	• bus bays, hubs, etc.
High			
Transit Service Investment	• frequent local fixed route • bus rapid transit	• *frequent local fixed route* • **bus rapid transit**	• *frequent local fixed route* • **bus rapid transit**
Rail Transit	The RTP's policy position is to recognize passenger rail transit for the Flagstaff region as feasible opportunities arise and as growth increases within and outside of Flagstaff. The Arizona DOT "*Building a Quality Arizona*" vision describes regional, intra and interstate transit services desired by 2050. FMPO will work with ADOT to monitor their potential and plan accordingly. (See Appendix E-2 for planning threshold information)		
Curb Side Investment		• bus shelters and stops	• bus shelters and stops
Street Side Investment		• bus bays, hubs, etc.	• bus bays, hubs, etc.

Baseline Policy Investment Expectation
Desired Policy Investment Expectation
Minimum Mobility Suitability Environment
Moderate Mobility Suitability Environment
High Mobility Suitability Environment
Not applicable

Using the Tool

1) Locate the area of interest on the Map 2.
2) Determine the area type: rural, suburban, urban.
3) Identify the level of service by color code.
4) On Table 8b, find the corresponding area type column and level of service color and label row. Colored areas indicate the prescribed policy position. Remember context sensitivity: an urban-high level of service is greater than a suburban-high level of service.

NOTES:

- Recommended transit service investments are based on suitability environment and area type. As suitability increases, transit service response may include increasing frequency on a route, adding a route, or adding new service such as Bus Rapid Transit.
- Includes provisions for non-fixed route, rural, and captive rider transit service.
- Use with Map 2 to define future opportunities and priorities. Future conditions will determine delivery of service. Not a route planning tool.

Facility Guidance, Policy Tables & Maps

Map 2 - Transit Future Level of Service

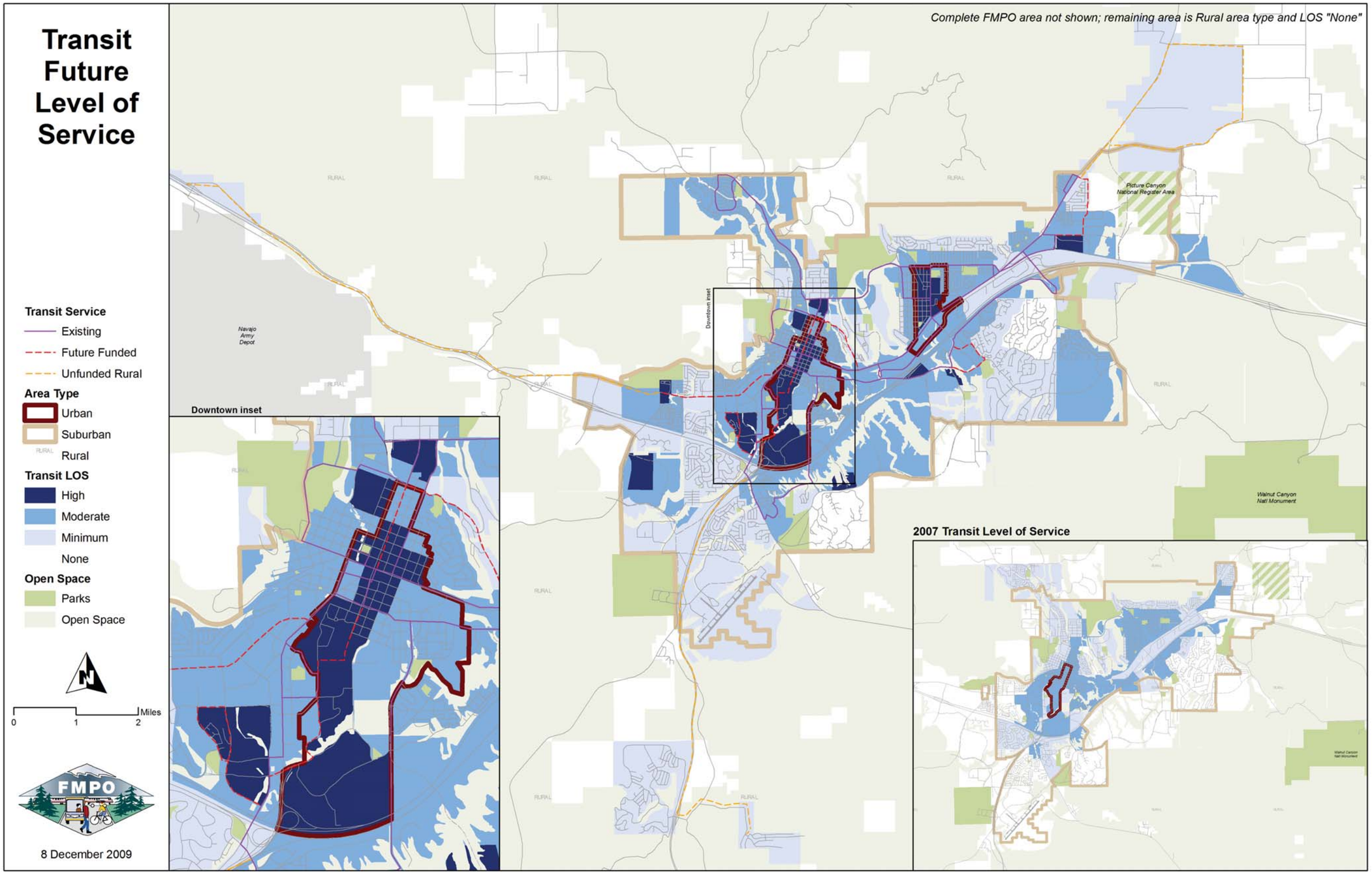


Table 9A: Pedestrian Facilities - Guidelines for Use *(see illustrations on next page)*

	Rural	Suburban	Urban
Basic Facilities			
Unpaved shoulder	Local streets without curb and gutter	Not used	Not used
Paved shoulder	Arterials and collectors without curb and gutter	Not used	Not used
Path	Significant open space National forest	Significant open space	Not used
Multi-use trail	Between major destinations Parallel to high speed/high volume roads	Between major destinations Parallel to high speed/high volume roads Greenbelts, open space, parks, recreation areas, drainage corridors	Greenbelts, open space, parks, recreation areas, drainage corridors
Sidewalk	Activity centers	Along all streets	Along all streets Some midblock pass-thrus to meet spacing objectives
Parkway	Landscaped	Landscaped	Furnishing strip
Arcade/promenade	Not typically used	High-level activity centers	Activity centers
Amenities: street furniture, etc.	Not typically used	High-level activity centers, transit stops Benches, specialty lighting, trash receptacles	Activity centers Benches, specialty lighting, trash receptacles, signing
Crossings			
Marked crosswalk	Activity centers	Major intersections Activity centers	Most intersections
Enhanced crosswalk	Activity centers, where high visibility is desired	High-level activity centers	Activity centers
Mid-block crossing	Not typically used	To meet spacing objectives	To meet spacing objectives
Mid-block crossing with ped signal	Not typically used	Pedestrian attractors/generators on either side of street High levels of concentrated ped crossings Significant distances between controlled intersections	Pedestrian attractors/generators on either side of street High levels of concentrated ped crossings
Grade-separated crossing (See appendices for more information)	Where grades allow on very high-speed/high volume roads	Where grades allow on high-speed/high volume streets	Not typically used
Curb extensions	Not typically used	High-level activity centers	Activity centers
Raised median/crossing island	Activity centers	High-level activity centers	Activity centers
Roadway Design			
Traffic management – diverters, closures	Not typically used	Local streets	Local streets
Traffic calming	Local streets - not typically used	Local streets Arterials and collectors through high-level activity centers	Local streets Arterials and collectors

Pedestrian Facilities

Pedestrian Actuated Signal

Pedestrian Actuated Signal

Pedestrian-Friendly Environment

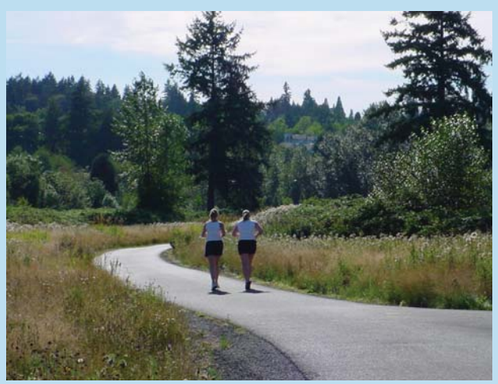
Pedestrian Friendly Environment

Ped - Bike Underpass

Ped-Bike Overpass

Raised Pedestrian Crossing

Textured Crosswalk



Multiuse Path

Walk to Transit

Perpendicular Curb Ramp

Natural Surface Path with Curb Ramp

Facility Guidance, Policy Tables & Maps

Table 9B: Pedestrian Facilities - Level of Service Guidelines

Level of Service	Rural	Suburban	Urban
None	**(Rural Arterials & Collectors only)**		
Sidewalk et al			
Vehicle speed	<55 mph	Unacceptable	Unacceptable
Traffic volume	>8,000 ADT		
Minimum	**(Rural Arterials & Collectors only)** **Exception for areas of 1 acre zoning**		
Sidewalk	5 feet	5 feet	< 6 feet
Parkway	5 feet	5 feet - landscaped	none
Amenities		Rarely used	Sometimes used
Crossing frequency		<660 feet	< 440 feet
Crosswalks - Marked		Standard	Standard or none
Extensions/islands			none
Target vehicle speed	45 mph	35 mph	30
Traffic volume	<30,000 ADT	<25,000 ADT	< 20,000 ADT
Moderate	**(Rural Arterials & Collectors only)**		
Sidewalk	5 feet	6 feet	6-8 feet
Parkway	5 feet	5 feet - landscaped	5 feet – furnishing zone
Amenities		Sometimes used	Regularly used
Crossing frequency		<440 feet	<330 feet
Crosswalks - Marked		High visibility markings	High visibility, pattern, color
Extensions/islands		Crossing islands	Crossing islands, curb extensions
Target vehicle speed	40 mph	30 mph	25 mph
Traffic volume	<25,000 ADT	<20,000 ADT	<10,000 ADT
High	**(Rural Activity Centers only)**		
Sidewalk		6-8 feet	8-10 feet
Parkway	The County may wish to require	5 feet - landscaped	5-15 feet – furnishing zone
Amenities	pedestrian amenities in these areas	Regularly used	Frequently used
Crossing frequency	to achieve higher safety, social or	<330 feet	<250 feet
Crosswalks - Marked	aesthetic objectives	High visibility, pattern, color	High visibility, texture, pattern, color
Extensions/islands		Crossing islands, curb extensions	Crossing islands, curb extensions, raised intersection
Target vehicle speed		25 mph	20 mph
Traffic volume		<15,000 ADT	<5,000 ADT

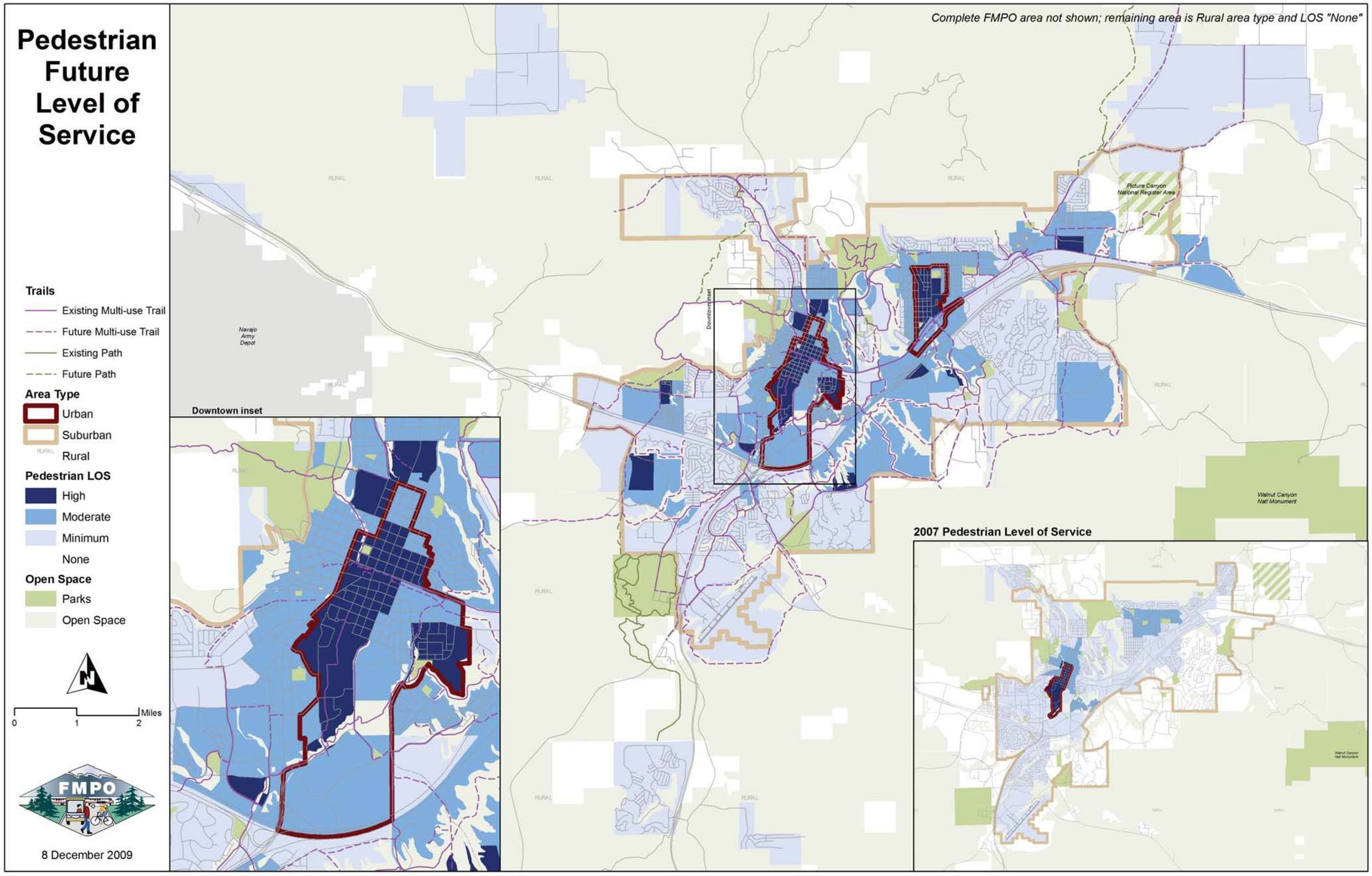
Using the Tool

1) Locate the area of interest on Map 3.
2) Determine the area type: rural, suburban, urban.
3) Identify the level of service by color code.
4) On Table 9b, find the corresponding area type column and level of service color and label row.

NOTES:

- Remember context sensitivity: an urban-high level of service is greater than a suburban-high level of service.
- Gray = prescribed policy level. Despite map, equal treatment of both street sides is accepted.
- White = above the prescribed policy level and may be pursued; or below the prescribed level and is not desired.
- Traffic volume and speed guidelines refer to side streets, not regional travel facilities (arterials and some collectors).
- See Table 10B – Bicycle Facilities for multi-use path information.

Map 3 - Pedestrian Future Level of Service



Facility Guidance, Policy Tables & Maps

Table 10A: Bicycle Facilities - Guidelines for Use *(see illustrations on next page)*

	Rural	Suburban	Urban
Basic Facilities			
Paved shoulder	Arterials and collectors without curb and gutter	Arterials and collectors that are "strip-paved;" an interim condition without curb and gutter	Not used
Shared roadway	Paved local streets	Local streets	Local streets
Bike lane	Arterials and collectors with curb and gutter	Arterials and collectors	Arterials and collectors
Multi-use trail	Between major destinations Parallel to high speed/high volume roads	Between major destinations Parallel to high speed/high volume roads Greenbelts, open space, parks, recreation areas, drainage corridors	 Greenbelts, open space, parks, recreation areas, drainage corridors
Path	Significant open space or National forest	Significant open space	Not used
Special facilities			
Shared lane markings	Not typically used	Moderate-speed/moderate volume streets where bike lanes are not possible but bike use is high	Moderate-speed/moderate volume streets where bike lanes are not possible but bike use is high
Boulevard	Not typically used	Parallel to high-speed/high-volume arterials Between major destinations	Parallel to urban arterials To meet spacing and grid objectives
Cycle track	Not typically used	High-speed, high-volume streets	Urban arterials
Buffered bike lane	Not typically used	High-speed, high-volume streets	Urban arterials
Colored bike lane	Not typically used	Complicated intersections High-volume intersections with high bike use	Complicated intersections High-volume intersections
Contra flow bike lanes	Not typically used	One-way streets to avoid out-of-direction travel	One-way streets to avoid out-of-direction travel
Bike box	Not typically used	High volume intersection with a high percentage of turning movements and high bike use	High volume intersection with a high percentage of turning movements
Parking			
Bike racks	Destinations, on-site	Destinations, on-site Select public locations in high-use areas	Destinations, on-site Frequent public locations
Bike shelter	Not used	Major destinations, on-site	Major destinations, on-site Select public locations in high-use areas
Bike lockers	Not used	Major destinations, on-site	Major destinations, on-site Select public locations in high-use areas
Bicycle sharing station	Not used	Major tourist attractions Transportation terminals	Major tourist attractions Transportation terminals Select public locations
Bike station	Not used	Not used	Single facility in convenient location

Bicycle Facilities

Bicycle Boulevard

Bike Box

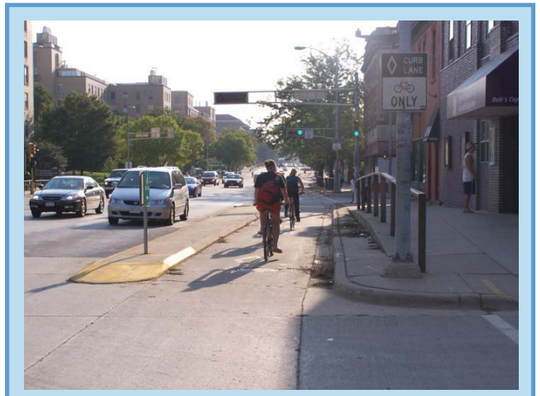
Bicycle Corral

Bike Lockers

Bike Pass Through

Bike Rentals

Colored Bike Lane



Contra Flow Bike Lane

Cycle Track

Bicycle Right Turn Lane

Bike and Bus Lane

Underpass

Facility Guidance, Policy Tables & Maps

Table 10B: Bicycle Facilities - Level of Service Guidelines

Level of Service	Rural	Suburban	Urban
None	**(Arterials & Collectors Only)**		
Path*	2-4 feet		
Multi-use trail	Aggregate, 6-8 feet		
Bike lane			
Shared roadway		Unacceptable	Unacceptable
Paved shoulder			
Special facilities			
Parking			
Vehicle speeds			
Spacing	>1 mile		
Minimum	**(Arterials & Collectors Only)**		
Path*	2-4 feet		
Multi-use trail	Aggregate, 8 feet	Aggregate, 8-10 feet	Less than 8' or none
Bike lane		Standard width	none
Shared roadway		Unsigned	Typical signing
Paved shoulder	4 feet		
Special facilities		Rarely used	Rarely Used
Parking	Racks	Racks	Infrequent
Vehicle speeds	<45 mph	<35 mph	<30 mph
Spacing	1 mile	1/2 mile	> 1/4 mile
Moderate	**(Arterials & Collectors Only)**		
Path*	4-6 feet		
Multi-use trail	Aggregate, 8-10 feet	Aggregate, 8-10 feet or paved, 10 feet Paved, 10 feet	Paved, 10-12 feet
Bike lane	Some roads	Standard and extra width	Standard width
Shared roadway		Signing on major routes	Regular signing
Paved shoulder	8 feet		
Special facilities		Sometimes used	Regularly used
Parking	Racks	Racks, locker, shelters	Racks, locker, shelters, sharing
Vehicle speeds	<40 mph	<30 mph	<25 mph
Spacing	1/2 mile	1/4 mile	1/4 mile
High	**(Arterials & Collectors Only)**		
Path*			
Multi-use trail	Paved 8-10 feet	Aggregate, 8-10 feet or paved, 10 feet	Paved, 12-14 feet
Bike lane		Standard and extra width	Standard width
Shared roadway		Regular signing	Universal signing, pavement markings
Paved shoulder			
Special facilities		Regularly used	Frequently used
Parking		Racks, locker, shelters, sharing	Racks, shelters, lockers, sharing, station
Vehicle speeds		<25 mph	<20 mph
Spacing		1/4 mile	1/8 mile

Using the Tool

1) Locate the area of interest on Map 4.
2) Determine the area type: rural, suburban, urban.
3) Identify the level of service by color code.
4) On Table 9b, find the corresponding area type column and level of service color and label row.

NOTES:

- Remember context sensitivity: an urban-high level of service is greater than a suburban-high level of service.
- Gray = prescribed policy level. Despite map, equal treatment of both street sides is accepted.
- White = above the prescribed policy level and may be pursued; or below the prescribed level and is not desired.
- Use with map on the following page to define requirements for new development, redevelopment, and bicycle/FUTS system refinement and expansion over time.

*** Path**

- Paths are not always parallel to a road.
- Paths serve pedestrians, too.
- Paths are most often used for recreational pursuits, but can also have a utilitarian function.
- Paths provide critical connections to "public multiple use lands" and access should be preserved and protected.

Map 4 - Bicycle Future Level of Service

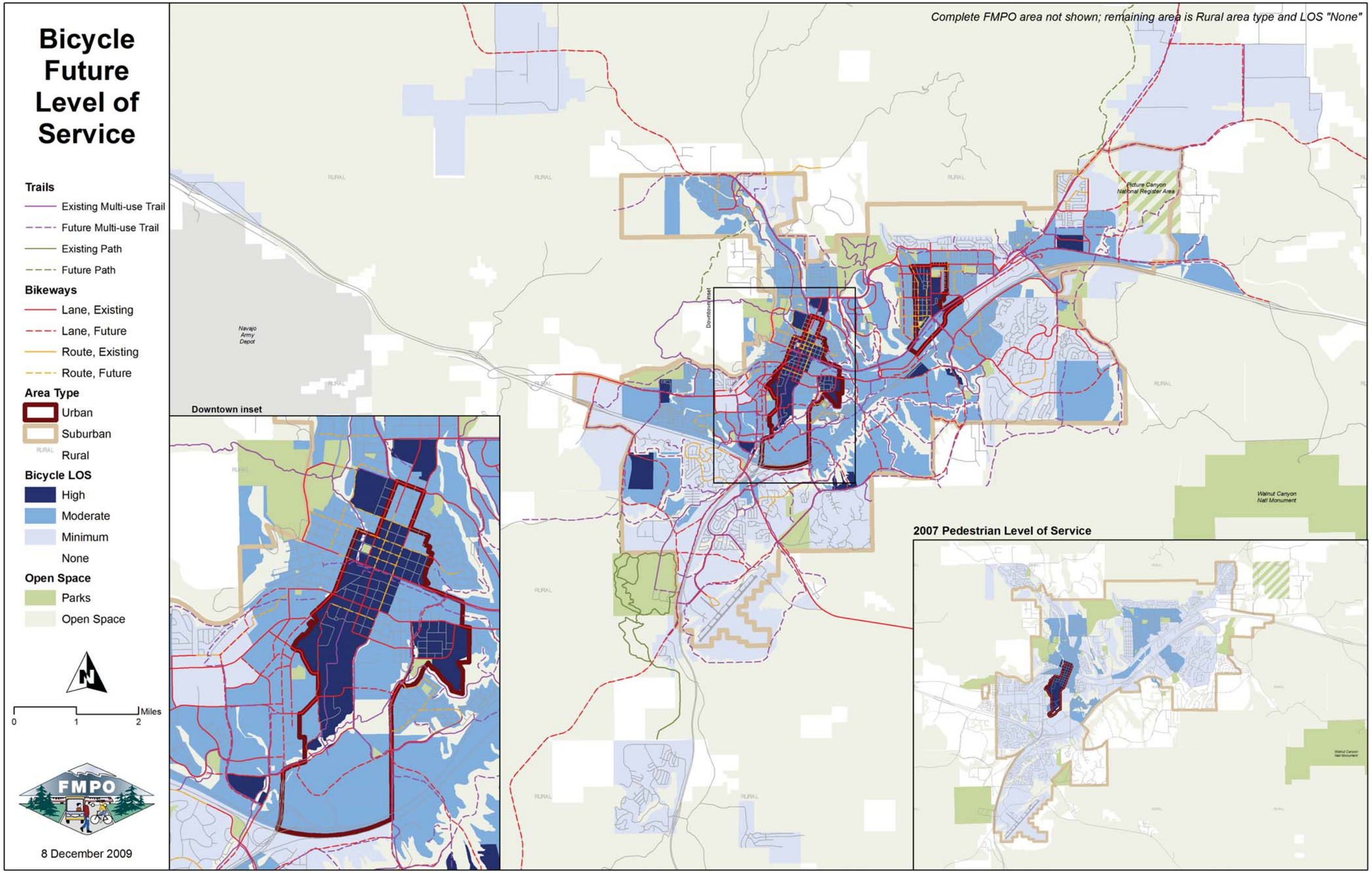
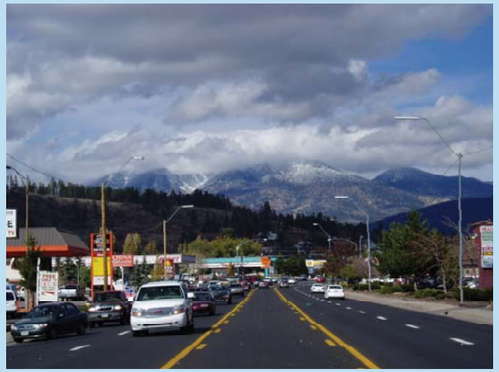


Table 11A: Streets and Roadways Planning/Design Criteria *(see illustrations on next page)*

Facility Type	Definition	Facilities (Multimodal)	Connectivity Measures →	Connectivity Standards
Access (local streets)	Local access to adjacent land uses	local streets, parking, sidewalks, crosswalks	• block length (ft.) • block size (area, perimeter, width, length) • block density (blocks/square mile • intersection density (int./square mile) • street density linear miles of streets/sq. mile of land) • connected node ratio (# of street int./# of tot. int. & cul-de-sacs) • connectivity index (# of links/# of nodes) • grid pattern (% of area w/4-way intersect.)	• 330' preferred, 528' max. (for access streets) • 1,000' preferred, 1,400' max. (for access streets) • 160 preferred, 100 min. • 160 preferred, 100 min. per square mile • 26 miles preferred, 18 miles minimum • 1.0 preferred, 0.7 minimum • 1.4 preferred, 1.2 minimum • 95% preferred, 85% minimum
Circulation (collectors/ connectors)	Movement between neighborhoods and non-residential land uses	collectors, connectors, transit routes, bike trails and lanes	• block length (ft.) • block size (area, perimeter, width, length) • block density (blocks/square mile) • street spacing (ft.) • grid pattern (% of area w/4-way intersect.)	• 330' preferred, 528' max. (for access streets) • 1,000' preferred, 1,400' max. (for access streets) • 160 preferred, 100 min. • 1/4 mile preferred, 1/2 mile max. • 95% preferred, 85% minimum
Regional Travel (arterials, freeways)	Long-distance travel across and between regions	freeways, arterials, rail transit, express bus lanes	• access management criteria balancing traffic flow, safety, and multimodal mobility	• to be developed through Regional Plan 2012 based on ADOT framework
Multimodal Corridors - circulation & travel overlay	Complete streets connecting area types, activity centers, and special districts for short and long trips	Complete streets with context-sensitive/appropriate multimodal facilities - overlay of circulation & travel facilities	Use underlying facility type-specific criteria above	

Street Facilities



Travel (Arterial) Corridor

Travel (Arterial) Corridor

Circulation (Collector) Corridor - Flagstaff

Circulation (Collector) Corridor

Access (Local) Street

Access (Local) Street

Road Enrichment

Road Enrichment

Multimodal Corridor

Multimodal Corridor

Intersection with Bike Lane

Intersection with Bus Treatment

Facility Guidance, Policy Tables & Maps

Table 11B: Level of Service (LOS) Policy Guidance (Development Review and Ongoing Performance Monitoring) (1) (2) (3)

Facility Type	Rural	Suburban	Urban	Special District
Access (local streets)	LOS C	LOS C	LOS C	Varies based on unique land use and infrastructure components of special districts. Priorities should be access to freight/goods movement and intermodal connections.
Circulation (collectors/connectors)	LOS C	LOS D	LOS D	
Regional Travel (arterials, freeways)	LOS D	LOS D	LOS E	
Multimodal Corridor	At least LOS D to/from designated urban areas and activity centers. Corridors should be designed as context-sensitive complete streets with at least "Minimum"-level walk/bike facilities for safe and consistent long-distance travel.			
Non-Auto Alt. Modes	Efforts to maintain intersection vehicle level of service and eventually mitigate decline in level of service will apply multi-modal approaches. These approaches will be applied internally to a development project or growth area. They may be applied externally to the areas surrounding the impacted intersection and the activity centers of varying scale associated with the development.			
Freight & Goods	Safety and goods movement	Rural and delivery access, neighborhood separation	Rural and suburban and balanced street design for delivery, movement, and personal mobility	

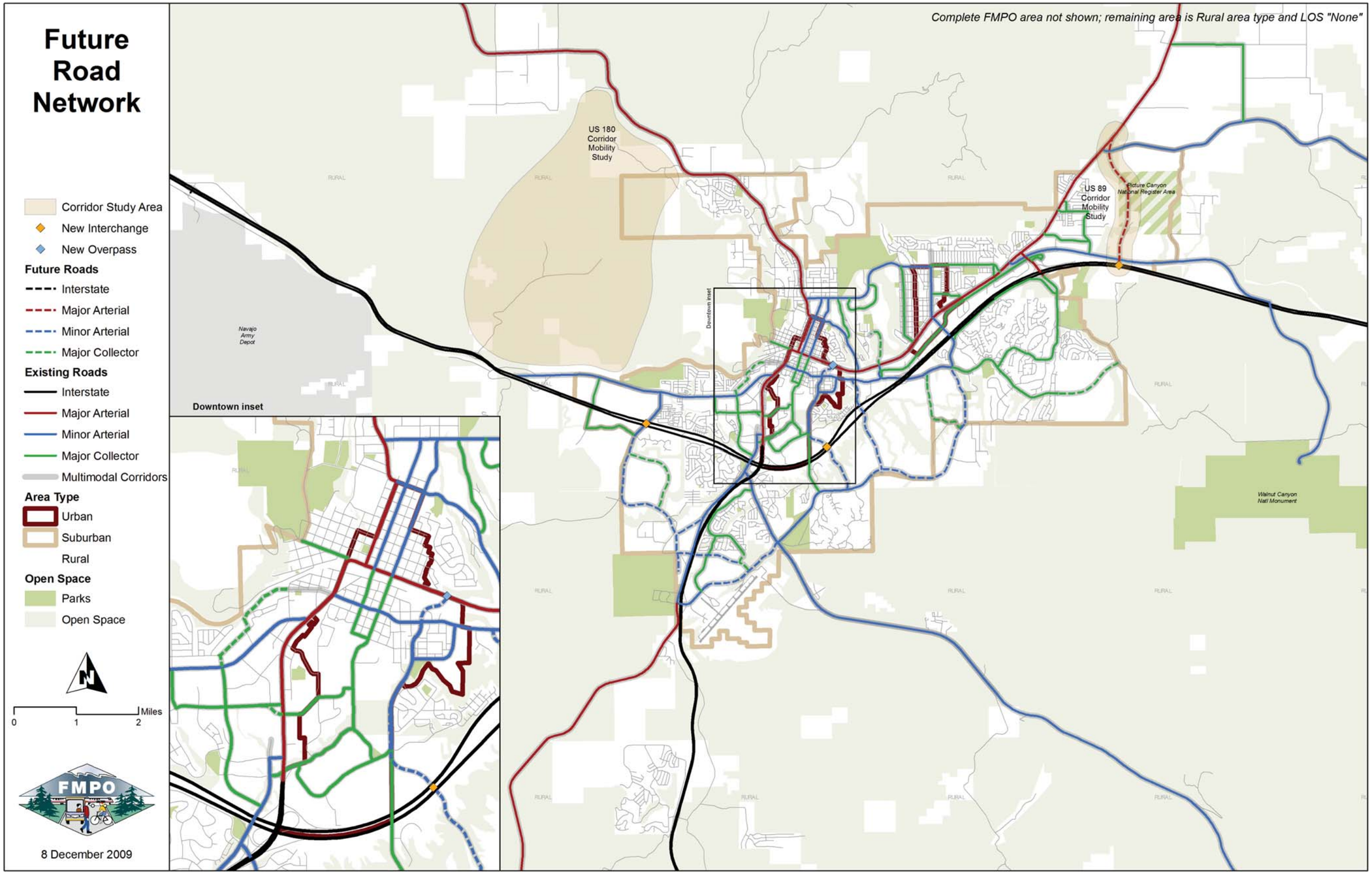
(1) Applied to development-impacted controlled intersections (PM peak hour) during entitlement TIA process.
(2) Applied to volume/capacity traffic model analysis for ongoing system performance monitoring.
(3) Intersection Level of Service, including critical movements, is a valued resource paid for and enjoyed by existing system users. Growth is responsible ofr addressing proportional impacts to service levels through improvements that address capacity supply or vehicular demand for the intersection(s) impacted. Responsibility may be accepted directly through the exaction process or indirectly through payment of a mobility fee.

Using the Tool - Streets and Roadways Planning Criteria

- Provides connectivity and access management criteria by facility functionality (access, circulation, regional travel, and multimodal corridor).
- Recommends automobile level of service at signalized intersections by area type. LOS is defined by the Federal Highway Administration and reflects intersection delay.
  LOS “A “is best or uninterrupted, “F” is worst and can mean grid-lock. Standardized software exists for evaluating intersection level of service.
- At intersections of two different facilities, the higher-classified facility LOS standard should be applied.
- Controlled intersection LOS analysis should be conducted within at least a one-mile impact radius from the project site.
  Signalized intersections should be evaluated as an optimized analysis of all signalized intersections within the impact area.
- Activity centers should meet the intersection LOS thresholds specified for the area type surrounding the activity center.
  Non-auto thresholds should be met as specified in each mode-specific table (transit, walk, and bike) for the desired (not baseline) investment for the area type surrounding the activity center.
- At such time as growth pushes an intersection below the standard set in Table IIB and expansion of the intersection is deemed infeasible, the options available may include denial of the project, deferring the project until a mitigating publicly programmed capital project is delivered, reduction in the scale of the project, or negotiated additional multimodal improvements equivalent to the cost of expanding the intersection.

Facility Guidance, Policy Tables & Maps

Map 5 - Future Road Network



Cost Constrained Projects & Revenue

Roadway Project Prioritization

A project's relative importance is related to how it affects the region's economy, character, and mobility over time. Each project is scored against a set of criteria to determine its relative value to the region within the next 20-years. Score for each project are located in Table 12 below and the components of the scores in Appendix F2. Costs by agency are found in Table 14.

Improvement projects are generally described as:

- Bypass – a new facility parallel to an existing route intended for congestion relief, network connectivity or both.
- Extension – the lengthening of an existing route to provide network connectivity.
- Widening – the addition of a new travel lane, lanes or turn lane to an existing road.
- Upgrade – enhancement of existing conditions. In urban areas this will often include median, landscaping, streetscaping, and pedestrian crossings. In rural areas it will likely involve shoulder or safety improvements.

The Alpha_ID field corresponds to the labels on the map. Tables 12 and 13 respectively list the projects by score and number. As a basis for comparison, FMPO scored several existing projects.

Fourth Street Railroad Crossing	22.9
Butler/Enterprise Intersection	15.2
Soliere Extension	16.3

Projects with higher scores won't always be built first. Funding availability, project readiness, the timing of development, and partnership opportunities will push some projects up or back in the capital program. Projects with low scores aren't necessarily excluded from the plan. Some may serve development not projected to occur within the 20-year period. Others may be exceptional relative to one or more criteria. Several of these are conditional projects described at right.

Using the Tool – Planned Road Projects

- Reference Table 12 to see how it scored. See the listing below for the treatment of "Conditional" projects.
- See the Appendices for a more complete description of the projects, their costs, and other information.

Conditional Projects – Route Preservation Strategy

- Clay Avenue Upgrade (#8) & Clay Avenue Extension (#7) – Extraordinary circumstance: the projects may be relegated unnecessary by major improvements to the Milton Road corridor. Conditions for Acceptance: Milton Rd. study indicates continued need for facilities AND neighborhood impacts can be mitigated.
- Lake Mary Road widening (# 33)– Extraordinary circumstance: The project may lend itself to narrowing at some point southeast of Cochise providing room for multimodal facilities. Conditions for Acceptance: Capacity study and cursory drainage review indicates probability of success.
- Metz Walk extension (#43) & Riordan Ranch Street South extension (#56) , & new Milton cross street (#45) - Extraordinary circumstance and Conditions for Acceptance: All projects improve circulation on Milton. All require redevelopment plans addressing right-of-way issues and intersection safety.
- Switzer Canyon Drive Extension (#61) – Identify appropriate areas for corridor preservation between Bow & Arrow Wash and Butler Avenue and require development to design for its potential extension. Extraordinary circumstance: The area served by this facility is by policy preferred traditional neighborhood development (TND). TND works best with a dense network that distributes traffic and a full scale connection between Butler and J.W. Powell Boulevard achieves this. Condition for Acceptance: Development comes at densities requiring the extension through the Rio de Flag canyon AND aesthetic, recreation and wildlife issues are mitigated.
- US 180 Bypass (# no number) – An early proposal from Woody Mountain Road to Hidden Hollow road was removed for violating open space policy and not providing desired emergency service access northwest of its northern termini. Extraordinary circumstance: Safety, evacuation and congestion issues related to winter snow play and support for future activity centers remain. Conditions for Acceptance: Mitigation measures such as traveler information, shuttle services and dispersed snowplay are exhausted AND measures are in place to exclude development of Observatory Mesa, preserve open space, and aggressively manage wildlife corridors.
- US 89 Bypass (#70) – Extraordinary circumstance: The project resolves system vehicular delay at a rate 300 times more than most other projects, yet can only score 33% more than any other project in the criteria matrix. Alternatives to the bypass are increased congestion on the existing highway or widening an already large facility. Conditions for Acceptance: A completed design concept report find widening the existing corridor is feasible and preferable OR determines mitigations for the impacts to open space,cultural and wildlife resources, and neighborhood.
- Woody Mountain Airpark (#74) – Extraordinary circumstance: Development driving the I-17 interchange at the west end of this project is coming in at lower densities, avoiding the requirement. If the interchange is eliminated, the road may be eliminated or terminate at Pulliam.
- Anita Drive Extension (#78) & Zuni Drive Extension (#79) – Extraordinary Circumstance: Both projects are subject to greater scrutiny by Northern Arizona University and the Arizona Board of Regents. Condition for Acceptance: NAU accepts the roadways into their master plan.

Cost Constrained Projects & Revenue

Table 12 - Road Projects by Score

Alpha_ID	Project	Score	Plan Status
35	Lone Tree Road Overpass (1)	25.95	Yes
59	W. Rte 66 Widening	25.94	Yes
6	Butler Avenue Widening	23.29	Yes
66	University Avenue Realignment	22.03	Yes
16	Fourth St. Upgrade - 66 to Cedar	22.03	Yes
58	Route 66 Enrichment	22.03	Yes
73	West Street Upgrade	20.78	Yes
2	Beulah Boulevard Extension	20.60	Yes
1	Bellemont TI Reconstruction	20.52	Yes
44	Milton Road Upgrade	19.54	Yes
7	Clay Avenue Extension	19.30	Conditional
12	Fort Valley Road Upgrade	19.27	Yes
56	Riordan Ranch St Extension - S	19.27	Conditional
17	Fourth St. Widening - Soliere to Butler	19.04	Yes
77	Woody Mountain Road Upgrade	18.02	Yes
38	Lone Tree Rd Realignmnt & TI	17.54	Yes
29	Industrial Drive Widening	17.51	Yes
31	J.W. Powell Blvd - Airport	17.40	Yes
43	Metz Walk Extension	15.51	Conditional
45	Milton - new cross street	15.51	Yes
71	Walnut - Florence Connector	15.38	Conditional
27	I-40 Widening - Country Club to 89 bypass	15.10	Yes
60	E. Rte 66 Widening (F40)	14.23	Conditional
4	Beulah Boulevard Upgrade	13.95	Yes
39	Lone Tree Rd Widening - Sawmill to Pine Knoll	13.88	Yes
21	High Country Trail Extension	13.77	Yes
3	Beulah Boulevard Realignment	13.59	Yes
24	I-40 Widening - Woody Mtn. to Lone Tree	13.41	Yes
63	Townsend-Winona Widening - 89 to Koch	12.70	Yes
62	Switzer Canyon Dr RR Underpass	12.67	No
76	Woody Mountain Road TI	12.67	Yes
42	McConnell Road Extension - W	12.44	Yes
9	Empire Extension	12.43	Yes
41	Mcconnell Drive Upgrade - existing	12.25	Conditional
22	I-17 Widening	11.83	Yes
64	Townsend-Winona Widening - Koch to Rio Rancho	11.44	Yes
47	New Lone Tree Road TI	11.34	Yes
54	Ponderosa Parkway Extension	11.19	Yes
8	Clay Avenue Upgrade	11.06	Conditional
36	Lone Tree Rd Realignment - south of 40	10.75	Yes
80	Stardust Trail Extension	9.92	#N/A
14	Fourth Street Extension - South	9.34	Yes
33	Lake Mary Rd Widening - Beulah to JWP	9.27	Conditional
40	McConnell Drive Extension - E to Lone Tree	9.24	No
32	J.W. Powell Blvd Extension to mid-point	8.96	Yes
26	I-40 Widening - Lone Tree to Country Club	8.35	Yes
72	Walnut Hills Drive Extension	8.27	Yes
55	Railhead Avenue Extension to 89 bypass	6.86	Yes
65	Townsend-Winona Widening - Rio Rancho to Leupp	6.70	No
20	Herold Ranch Rd Widening	6.32	Yes
49	New Woody Mountain Collector	6.30	Yes
75	Woody Mountain Rd SW	6.29	Yes
74	Woody Mountain Rd Airpark	6.20	Conditional
61	Switzer Canyon Dr - Butler to JWP	5.93	Conditional
50	Palmer Avenue Extension	5.72	Yes
30	J.W. Powell Blvd Extension to Herold Ranch	4.89	Yes
57	Riordan Ranch St Extension - N	4.88	No
69	US 180 Upgrade - Far North	4.06	Yes
28	I-40 Widening - 89 bypass to Winona	3.89	No
78	Anita Drive Extension	3.66	Conditional
70	US 89 Bypass	2.71	Conditional
5	Butler Avenue Extension	2.46	Yes
52	Pipeline Arterial (2) - east end	1.54	No
68	US 180 Bypass	0.01	No
46	New Little America Collector	-0.11	No
53	Pipeline Arterial (1) - west end	-1.31	No
10	Enterprise Drive Overpass	n/a	No
11	Fanning Street Extension	n/a	No
13	Fourth Street Extension - North	n/a	No
15	Fourth Street TI	n/a	No
18	Gemini Drive Extension	n/a	Yes
19	Herold Ranch Road Extension	n/a	No
23	I-40 Widening - Bellemont to A-1	n/a	No
25	I-40 Widening - A-1 to Woody Mtn.	n/a	No
34	Lake Mary Rd Widening - JWP to limits	n/a	Yes
37	Lone Tree Rd Realignment - Sawmill	n/a	Yes
51	Pine Cliff drive Extension	n/a	Yes
67	University Drive Extension	n/a	Yes
79	Zuni Drive Extension	n/a	Conditional

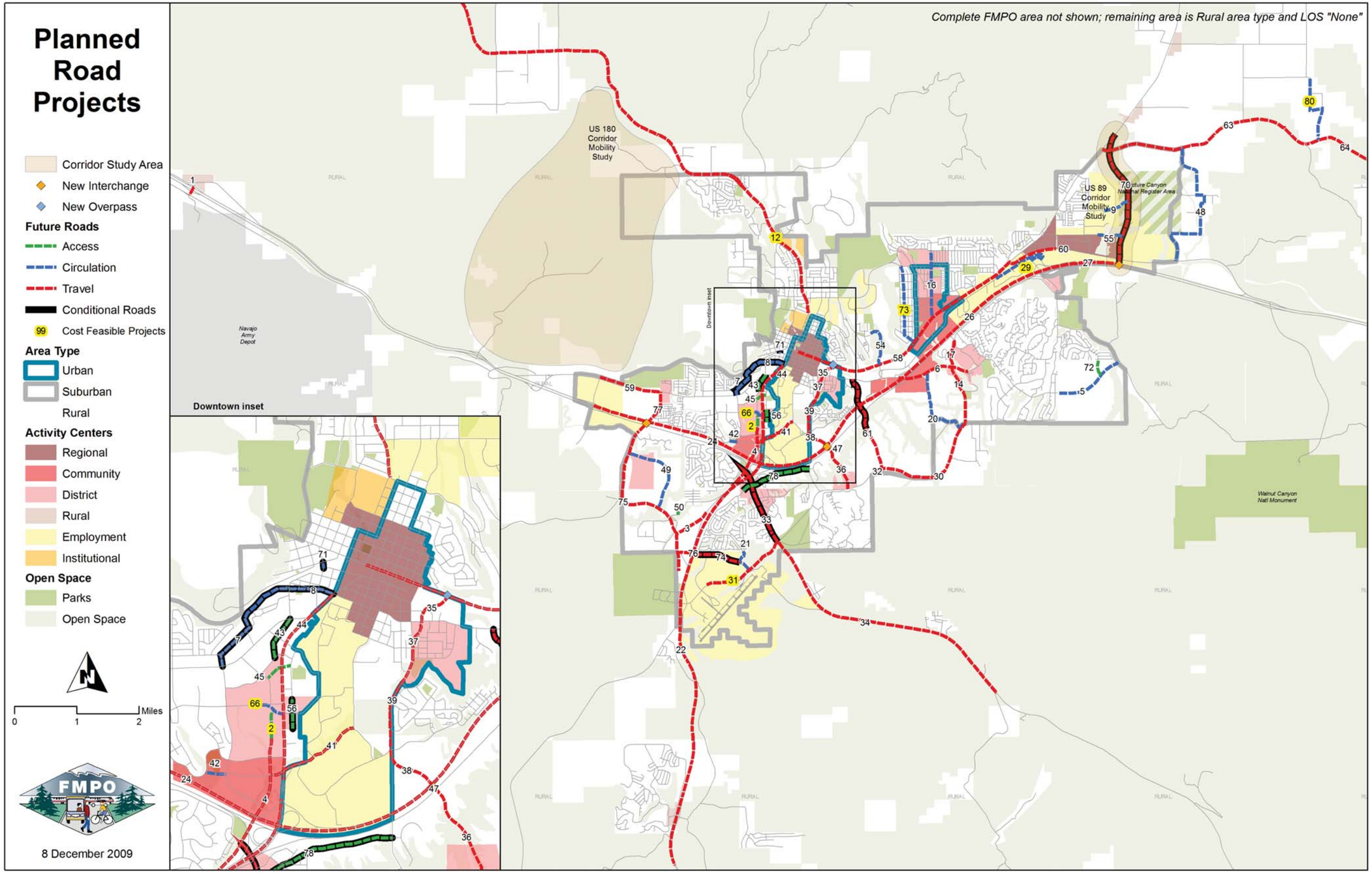
Cost Constrained Projects & Revenue

Table 13 - Road Projects Alpha-Numeric Listing

Alph_ID	Project
1	Bellemont TI Reconstruction
2	Beulah Boulevard Extension
3	Beulah Boulevard Realignment
4	Beulah Boulevard Upgrade
5	Butler Avenue Extension
6	Butler Avenue Widening
7	Clay Avenue Extension
8	Clay Avenue Upgrade
9	Empire Extension
10	Enterprise Drive Overpass
11	Fanning Street Extension
12	Fort Valley Road Upgrade
13	Fourth Street Extension - North
14	Fourth Street Extension - South
15	Fourth Street TI
16	Fourth St. Upgrade - 66 to Cedar
17	Fourth St. Widening - Soliere to Butler
18	Gemini Drive Extension
19	Herold Ranch Road Extension
20	Herold Ranch Rd Widening
21	High Country Trail Extension
22	I-17 Widening
23	I-40 Widening - Bellemont to A-1
24	I-40 Widening - Woody Mtn. to Lone Tree
25	I-40 Widening - A-1 to Woody Mtn.
26	I-40 Widening - Lone Tree to Country Club
27	I-40 Widening - Country Club to 89 bypass
28	I-40 Widening - 89 bypass to Winona
29	Industrial Drive Widening
30	J.W. Powell Blvd Extension to Herold Ranch
31	J.W. Powell Blvd - Airport
32	J.W. Powell Blvd Extension to mid-point
33	Lake Mary Rd Widening - Beulah to JWP
34	Lake Mary Rd Widening - JWP to limits
35	Lone Tree Road Overpass (1)
36	Lone Tree Rd Realignment - south of 40
37	Lone Tree Rd Realignment - Sawmill
38	Lone Tree Rd Realignmnt & TI
39	Lone Tree Rd Widening - Sawmill to Pine Knoll
40	McConnell Drive Extension - E to Lone Tree
41	Mcconnell Drive Upgrade - existing
42	McConnell Road Extension - W
43	Metz Walk Extension
44	Milton Road Upgrade
45	Milton - new cross street
46	New Little America Collector
47	New Lone Tree Road TI
48	New Rain Valley Collector
49	New Woody Mountain Collector
50	Palmer Avenue Extension
51	Pine Cliff drive Extension
52	Pipeline Arterial (2) - east end
53	Pipeline Arterial (1) - west end
54	Ponderosa Parkway Extension
55	Railhead Avenue Extension to 89 bypass
56	Riordan Ranch St Extension - S
57	Riordan Ranch St Extension - N
58	Route 66 Enrichment
59	W. Rte 66 Widening
60	E. Rte 66 Widening (F40)
61	Switzer Canyon Dr - Butler to JWP
62	Switzer Canyon Dr RR Underpass
63	Townsend-Winona Widening - 89 to Koch
64	Townsend-Winona Widening - Koch to Rio Rancho
65	Townsend-Winona Widening - Rio Rancho to Leupp
66	University Avenue Realignment
67	University Drive Extension
68	US 180 Bypass
69	US 180 Upgrade - Far North
70	US 89 Bypass
71	Walnut - Florence Connector
72	Walnut Hills Drive Extension
73	West Street Upgrade
74	Woody Mountain Rd Airpark
75	Woody Mountain Rd SW
76	Woody Mountain Road TI
77	Woody Mountain Road Upgrade
78	Anita Drive Extension
79	Zuni Drive Extension
80	Stardust Trail Extension

Cost Constrained Projects & Revenue

Map 6 - Planned Road Projects



Cost Constrained Projects & Revenue

Criteria Descriptions

The projects were evaluated against criteria derived from the values expressed by public involvement participants. Stakeholders and the Executive Board scored the criteria against each other and developed weights that were discussed and adjusted finally at an FMPO open meeting in September 2009. Staff then established a scoring system from -3 to 3 for each of the criteria. The weights and scores are:

Increase Safety: Weight 1.51 - The degree to which fatalities, injuries and accidents are reduced

Score	Description
3	Corrects known high accident locations or emergency response deficiency
0	Has no impact on safety (new projects are presumed to be neutral)
-3	Creates an unsafe condition

Maintain Roads & Improve Operations: Weight 1.51 - The degree to which the City, County and State maintain and improve existing road and trail surfaces, signal and other roadway operations and transit operations before they invest in new facilities.

Score	Description
3	New Lane Miles/Volume-to-Capacity (VOC) 0 to 10
0	New Lane Miles/VOC 11 to 50
-3	New Lane Miles/VOC 50+

Build on Existing Community Character: Weight 1.41 - The degree to which the mix, scale and design (aesthetics and level of amenities like landscaping) of facilities matches their surroundings.

Score	Description
3	Supports activity center(s), results in no widening of existing roads, does not violate expected open space and does not negatively impact neighborhood(s)
0	Achieves at least one of the above or prevents widening
-3	Achieves none of the above

Support for Economic Development: Weight 1.34 - The degree to which the transportation project delivers appropriate facilities to support our diverse economy.

Score	Description
3	Project runs through or is adjacent to an Employment Center
0	Project supports no centers
-3	Project diminishes access to centers

Preserve the Environment: Weight 1.33 - The degree to which the transportation project or system disrupts the natural environment.

Score	Description (resource = wildlife corridor, habitat, cultural resource)
3	Impacts no resources or impacts can be fully mitigated
0	Impacts resources and can be partially mitigated
-3	Impacts resources and cannot be mitigated

Shorten the Duration of Vehicle Trips: Weight 1.33 – The degree to which vehicle delay and trip distance are reduced. (VHT = vehicle hours of travel; VMT = vehicle miles of travel

Delay (1.33)

Score	Description
3	VHT increases by 0.48%+ without the project
0	VHT is neutral
-3	VHT decreases 0.48%+ without the project

Distance (1.33)

Score	Description
3	VMT increases 0.5%+ without the project
0	VMT is neutral
-3	VMT decreases 0.5%+ without the project

Reduce the Number of Vehicle Trips: Weight 1.25 - The degree to which the transportation project reduces vehicles trips primarily through the provision of facilities supporting pedestrian, bicycle and transit trips.

AND

Expand Travel Mode Choices: Weight 1.28 - The degree to which more people have access to a broader range of viable travel choices.

Score	Description
3	Runs through two or more activity centers, supporting access by all modes
0	Runs through or by no activity centers
-3	Diminishes access to activity center(s)

See the appendices for a breakdown of each project and its score for each criteria including projects ultimately rejected for inclusion in the plan.

Cost Constrained Projects & Revenue

Table 14 - Project Cost by Agency in 2009 Dollars: Cost includes Design, Right-of-Way, Construction

Arizona Department of Transportation

Alpha_ID	Project Name	Cost
1	Bellemont TI Reconstruction	$ 8,930,000
12	Fort Valley Road Upgrade	$ 5,670,000
22	I-17 Widening: Kachina to I-40	$ 37,720,000
23	I-40 Widening: Bellemont to A-1	$ 24,980,000
24	I-40 Widening: Woody Mtn. to Lone Tree	$ 20,960,000
25	I-40 Widening: A-1 to Woody Mtn.	$ 15,570,000
26	I-40 Widening: Lone Tree to Country Club	$ 24,680,000
27	I-40 Widening: Country Club to new 89	$ 6,380,000
28	I-40 Widening: new 89 to Winona	$ 51,140,000
44	Milton Road Upgrade: Riordan to 180	$ 19,220,000
69	US 180 Upgrade - Far North Shoulders	$ 54,560,000
	Subtotal	$ 269,810,000
	Five I-40 interchanges**	$ 125,000,000
	Partnership share of expenses*	$ 17,790,000
	TOTAL	**$ 394,810,000**

City of Flagstaff

2	Beulah Boulevard Extension	$ 2,190,000
7	Clay Avenue Extension	$ 7,850,000
8	Clay Avenue Upgrade	$ 4,450,000
16	Fourth Street Upgrade	$ 19,620,000
17	Fourth Street Widening	$ 13,850,000
29	Industrial Drive Widening	$ 7,790,000
31	J.W. Powell Blvd Airport	$ 14,160,000
33	Lake Mary Rd Widening: Beulah to JWP	$ 15,480,000
35	Lone Tree Road Overpass: 66 to Butler	$ 36,430,000
39	Lone Tree Road Widening: Sawmill to Pine Knoll	$ 8,850,000
40	McConnell Drive Extension - E to Lone Tree	$ 2,910,000
45	New Milton Access Road	$ 3,540,000
60	E. Rte 66 Widening (F40)	$ 22,120,000
66	University Avenue Realignment	$ 2,450,000
	Subtotal	$ 161,690,000
	Partnership share of expenses*	$ 41,810,000
	TOTAL	**$ 203,500,000**

* See the "Partnership Expense" part of the table. Final negotiations may shift all or most expenses to one or more parties.

** The number of interchanges, segment to be widened and number of lanes is subject to the ongoing I-40 Design Concept Report. Interchanges might include A-1, Flagstaff Ranch, Butler and Country Club.

Northern Arizona University

41	Mcconnell Drive Upgrade: on Campus	$ 6,890,000
	TOTAL	**$ 6,890,000**

Developer

3	Beulah Boulevard Realignment	$ 14,950,000
4	Beulah Boulevard Upgrade	$ 13,080,000
5	Butler Avenue Extension	$ 6,880,000
14	Fourth Street Extension - South	$ 7,480,000
18	Gemini Drive Extension	$ 6,100,000
20	Herold Ranch Road Widening	$ 18,030,000
21	High Country Trail Extension	$ 890,000
30	J.W. Powell Blvd Extension: midway to 4th	$ 10,010,000
32	J.W. Powell Blvd Extension: Lone Tree to midway	$ 4,070,000
36	Lone Tree Road Realignment: 40 to JWP	$ 8,500,000
37	Lone Tree Road Realignment: Butler to Sawmill	$ 4,070,000
42	McConnell Road Extension - W to Highland Mesa	$ 1,540,000
48	New Rain Valley Collector	$ 9,590,000
49	New Woody Mountain Collector	$ 6,640,000
50	Palmer Avenue Extension: S to Woody Mtn.	$ 300,000
51	Pine Cliff drive Extension: N to Forest	$ 2,550,000
54	Ponderosa Parkway Extension: S to 66	$ 4,860,000
72	Walnut Hills Dr Extension: S to Butler	$ 2,270,000
74	Woody Mountain Rd: Airpark	$ 12,080,000
75	Woody Mountain Rd SW	$ 28,350,000
78	Anita Drive Extension: East to Zuni	$ 7,760,000
	Subtotal	$ 170,000,000
	Partnership share of expenses*	$ 41,810,000
	TOTAL	**$ 211,810,000**

Coconino County

63	Townsend-Winona Widening: 89 to Koch	$ 13,140,000
64	Townsend-Winona Widening: Koch to Rio Rancho	$ 6,280,000
65	Townsend-Winona Widening: Rio Rancho to Winona	$ 19,680,000
80	Stardust Trail	$ 3,750,000
	TOTAL	**$ 39,100,000**

Partnership Expenses

6	Butler Avenue Widening	$ 8,860,000
9	Empire Extension	$ 2,770,000
38	Lone Tree Rd Realignmnt & TI: Pine Knoll to I40	$ 24,760,000
43	Metz Walk Extension: S to Plaza Way	$ 3,190,000
55	Railhead Avenue Extension: E to new 89	$ 6,460,000
56	Riordan Ranch St Extension - S	$ 2,000,000
58	Route 66 Enrichment: 180 to Fanning	$ 5,780,000
59	W. Rte 66 Widening: Woodlands to Flag Ranch	$ 10,370,000
61	Switzer Canyon Dr Extension: Butler to JWP	$ 16,980,000
76	Woody Mountain Road TI	$ 24,470,000
	TOTAL	**$ 105,640,000**

GRAND TOTAL **$ 961,750,000**

Final Plan Cost Estimates

Costs for the "Needs" plan illustrated on Map 6 are depicted on this page. Costs estimates are in 2009 dollars. They are comprised of design fees at 16% of construction cost, estimated right-of-way expenses, construction costs, and 20-years of maintenance. The last component uses a lane mile figure. Costs exclude contract administration estimated at 10-15% of construction. The partnership expenses assigned to agencies and developers are rough estimates and ultimately subject to negotiation.

Construction cost components include a per-lane-mile cost plus additional costs for enhancements, slope, drainage, bridges, major intersections and contingencies.

Transit costs are much less accurate in that future routes are not planned. One estimate based on a 2.5% inflation rate, staged service increases and the geographic expansion shown on the Map 3 is $176,000,000.

The total roadway and transit expense for the plan exceeds $1.1 billion.

No cost estimates for trails and sidewalks are provided.

See Appendix G for more information.

Cost Constrained Projects & Revenue

Cost Feasible Projects, Costs, and Revenues

It is a federal and state requirement that this RTP identify and balance 2030 project costs and revenues to develop a list of "cost feasible" transportation projects for funding. Project construction or delivery costs have been inflated to the year of expenditure and related to revenue estimates. These revenue estimates, in Table 15 below, in turn aggregate all federal, state, and local transportation project delivery revenues reasonably anticipated to be available through 2030 for the Flagstaff region.

This has the effect of excluding development provided projects and bond projects. Also, the ADOT project selection process is difficult to predict outside of the 5-year capital program, so the projects identified are somewhat speculative.

Table 15 - Regional Transportation Revenues 2010 - 2030

By Jurisidiction and Source	
City of Flagstaff	
Sales Tax*	227,305,263
HURF	168,538,894
LTAF	8,509,111
TE Grants	4,166,667
subtotal	404,353,268
Coconino County	
HURF	61,229,315
LTAF	2,936,590
TE Grants	3,125,000
subtotal	64,165,906
Arizona DOT	
Federal	90,750,800
HURF	36,750,000
subtotal	127,500,800
NAIPTA	
5307	15,499,480
Other (non-tax)	8,270,466
FMPO	
STP	6,000,000
HSIP	12,000,000
Total	**629,519,454**

By Purpose	
Maintenance	321,844,505
Fourth Street*	27,793,451
Ped/Bike*	37,723,148
Transit*	138,913,573
Planning	1,200,000
Roads Capital	**102,044,776**
Maintenance Assumptions	
15% of Street Tax (35% in 2021)	
95% of City HURF	
95% of County HURF	
60% of Federal	
90% of State HURF	
Other Assumptions	
4th Street Tax ends 2020	
All other taxes extended	
City TE grant every 3 years	
County TE grant every 4 years	
All LTAF to transit	
$110k/yr BBB for trails	
No property tax bonds assumed	
No developer fees or exactions	

Acronyms/Definitions	
Sale Tax	Sum of 2000 and 2008 city sales taxes for transportation
*	Sales taxes exist for Fourth Street, Ped/Bike, Transit and Streets
HURF	Highway User Revenue Fund, state gas tax
LTAF	Local Transportation Assistance Fund, lottery, all for transit
TE Grants	Transportation Enhancement grants, Federal through the state
Federal	Federal gas tax to the state
STP	Surface Transportation Program, federal gas tax through state
BBB	Bed, Board and Beverage city tax, percentage toward trails
5307	Federal urban transit funding named for section in federal law
ADOT	Arizona Department of Transportation
NAIPTA	Northern Arizona Intergovernmental Public Transportation Authority "Mountain Line" Transit Agency
FMPO	Flagstaff Metropolitan Planning Organization
HSIP	Highway Safety Improvement Program

As these efforts demonstrate, future roadway needs and priorities far exceed the region's funding resources and capabilities. As shown, the city can fund only five local projects Additionally, ADOT is projected to deliver two projects within the 2030 time horizon – the J.W. Powell/89a Intersection and the upgrade of Ft. Valley Road within the City limits. Coconino County is projected to deliver only one project within the time horizon – the extension of Stardust Trail to Rio Rancho Road.

However, it should be noted that many projects will be paid for by private development as it creates the need for them (known as "pay as you grow"). ADOT's capital programming process precludes identifying long-range funds predictably, so it is possible that an important project, like improvements to an interstate, may be funded in the future. Some projects will be bonded for by the City of Flagstaff as voters approve them. Grants may be received or high priority federal projects identified and other opportunities arise over time.

For transit projects, NAIPTA is aggressively implementing a 10 year transit plan funded by voters through sales tax measures passed in 2008. NAIPTA has also identified new service investments desired for outlying communities and rural areas, but no funding is currently available, NAIPTA's proactive planning work will facilitate service implementation if and when funding opportunities arise.

The region is also proactively planning for bicycle/pedestrian investments and enhancements to the FUTS (Flagstaff Urban Trail System) network. These projects are more opportunistic, undertaken by new development, through roadway enhancement/enrichment projects, or as other opportunities arise.

Most importantly, the value of the RTP is to express a transportation system based on needs related to community policy preferences and values. As project costs, revenue estimates, and even transportation needs change over time, this RTP provides the technical and policy tools to guide transportation investment integrated with land use and urban form.

Cost Constrained Projects & Revenue

Federal Funds

None of the local government roadway projects are projected to use federal funds. The funds received by FMPO for construction will be used for a combination of transportation studies and supplementing other safety and roadway projects as needed. The highway safety funds received by FMPO will be programmed according to the "Safety Component" study highlighted in Appendix B.

Table 16 - Cost-Feasible Road Construction Projects

Years	Agency	Project	Cost
2010-2014	Flagstaff	Beulah Boulevard Extension	$ 2,060,000
	Flagstaff	West Street Upgrade - Full	$ 10,070,000
	ADOT	J.W.Powell/89a Intersection	$ 7,250,000
2015-2019	Flagstaff	University Avenue Realignment	$ 2,960,000
	Flagstaff	Industrial Drive Widening	$ 11,090,000
	Coconino	Stardust Trail	$ 2,370,000
	ADOT	Ft. Valley Road Upgrade	$ 7,759,787
2020-2024		NO PROJECTS IN THIS TIME PERIOD	
2025-2030	Flagstaff	J.W. Powell Blvd - Airport	$ 29,810,000

Table 17 - NAIPTA
Fiscally Constrained Revenue Hours

Year	Revenue Vehicle Hours
2010	59,146
2015	60,822
2020	62,382
2025	63,957
2030	65,572

NOTE: The cost constrained projects listed on this page are subject to change.
These lists are based on:

- Scoring from the original criteria
- Federal requirement for a minimum 4% per year inflation rate
- Access to different funding streams for various activities – maintenance, pedestrian and bicycle facilities
- Coordinating funding assumptions and timing between agencies where partnerships are required.
- Assuring past commitments to the public are appropriately fulfilled.
- Exploration of phasing scenarios.
- Project readiness

Acronyms & Glossary

List of Acronyms

ADA - Americans with Disabilities Act
ADOT - Arizona Department of Transportation
BRT - Bus Rapid Transit
CSS - Context Sensitive Solutions
FHWA - Federal Highway Administration
FMPO - Flagstaff Metropolitan Planning Organization
FTA - Federal Transit Administration
GHG - Greenhouse Gas
HURF - Highway User Revenue Fund
LID - Low Impact Development
LOS - Level of Service
MPG - miles per gallon
MPO - Metropolitan Planning Organization
NAIPTA - Northern Arizona Intergovernmental Public Transportation Authority
SAFETEA-LU - Safe, Accountable, Flexible, Efficient, Transportation Equity Act - a Legacy for Users
STP - Surface Transportation Program
TAZ - Traffic Analysis Zone
TI - Traffic Interchange
TND - Traditional Neighborhood Development

Glossary

activity center – an area within a community characterized by mixed land uses, high density, and compact, traditional development patterns, typically resulting in a high level of activity

area type – the character of an area related to its pattern of development – urban, suburban or rural

arterial street – a larger road or highway purposed to carry longer trips across the region and to other regions

bicycle boulevard – a street where bicyclists share the roadway with motor-vehicle traffic, designed to provide bicycle travel greater continuity, safety and right-of-way advantages

bike box –a marked or painted rectangle located at signalized intersections between the motor-vehicle stop line and the crosswalk that allows bicyclists to pull in front of waiting traffic

bypass – a roadway or other transportation facility purposed with directing travel around a target area generally to avoid congestion or avoid creating congestion

collector street – a street purposed with collecting traffic from surrounding local roads, often within a neighborhood or district, and delivering to an arterial street

commuter [bus] route – a fixed bus route running only during peak commuter times, usually in the morning and evening

compact development – development that takes place within a defined, concentrated or central area, sometimes designated by an urban growth boundary

congestion – when the volume of cars on a given road is such that crowding, interaction between vehicles, and stop and delay increases

context – the nature of the surrounding environment including its development patterns, density, landscaping, history, residential, commercial or undeveloped character and other aspects to be respected

contra-flow bicycle lane – a signed and striped lane where bicycles travel in a direction opposite to vehicular traffic

conventional development – development characterized by separated land uses on large or disconnected blocks, lower densities and strip or shopping center commercial development

cycle-track – a bicycle lane separated from traffic by a wider buffer often with a physical element such as a curb

density – the amount of development within a given area, usually expressed in dwelling units, population or employment per acre or square mile

express bus – a bus route that may follow a standard route but skips several intervening stops, making a quicker trip to the destination

furnishing zone – the space between the curb and sidewalk that in urban areas is paved and occupied by benches, signs, etc.

greenhouse gas emissions – carbon dioxide and other gases that accumulate in the atmosphere and trap heat

hybrid development – a development pattern characterized by elements of conventional and traditional development

infill development – development that occurs on vacant parcels that are surrounded by existing development

intermodal (intermodal yard) – the interaction, sometimes transfer, between means or modes of travel. An intermodal yard involves moving freight between rail to truck modes of transport

level of service (LOS) -

local street – local streets serve immediate access to property and are designed to discourage longer trips through a neighborhood

mixed use development – a diverse and complimentary set of uses within close proximity to each other through vertical integration and/or smaller lot sizes

mobility – the degree to which people and goods may move safely, efficiently, and effectively between origins and destinations

mode – a means of travel such as pedestrian, bicycle, transit, truck

multimodal – travel or transportation systems characterized by more than one means or mode of transport

multimodal corridor – a road or highway designed and intended to carry more than one mode of travel with a high level of mobility

off-peak hour – those hours of the day – usually late evening into very early morning -- outside of peak hour where travel is light

parkway – the unpaved area between the curb and sidewalk reserved for landscaping, contrast to furnishing zone

peak hour – that hour or hours of the day when travel demand is greatest, often the morning and evening commute periods

redevelopment – the removal of existing development and replacement with newer structures that may contribute to the transformation of the area type

stakeholder – an individual or organization that can

traditional neighborhood development – development characterized by small blocks, small lots, and human-scaled buildings

traffic analysis zone – a unit of geography used to support traffic modeling. Zones are often defined by the road network and contain similar levels of activity, so rural zones are much larger than urban zones

transect – a sample strip of land, from the center of region to the edge, used to examine or define development patterns

urban growth boundary – a legislated boundary around a community within which all urban growth should occur

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B. HIGH ACCIDENT LOCATION SAFETY ANALYSIS

C. FUTURE LAND USE

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E. TRANSIT, PEDESTRIAN AND BICYCLE SERVICE AND FACILITY GUIDANCE

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I. POTENTIAL FMPO RTP IMPLEMENTATION STRATEGIES

J. SAFETEA-LU COMPLIANCE

Other materials available electronically are:
FMPO RTP 2009 - Inventory of Public Comment Period Responses
FMPO RTP 2009 Public Involvement Report
Safety Component of FMPO RTP Update

Note: Content to be provided electronically at time of final publication.
Appendices are not intended as policy. They are supplemental material to describe analysis, facilities, processes or provide further planning guidance.