5 | Roadway Plan

5.1 OVERVIEW

Changes in the Federal Transportation bill (MAP-21) now stress that MPOs reconsider the prioritization of future roadway plans and projects. In years past, new road improvements and facilities would react to projected population and employment growth figures. As growth pressures occurred, new infrastructure projects would be created to serve areas or to provide relief to road and street facilities. An example that played out in the Farmington MPO was the design and construction of US 64 from Bloomfield to Farmington. This multi-million dollar per-lane mile project gained momentum in the early 2000s based on projected increases in average annual daily traffic volumes (~25,000 to ~45,000) in 2025 compelling the need to expand capacity.

Making investments to maintain a state of good repair to the MPOs existing infrastructure requires an asset management and system preservation plan. These often played second fiddle to the expansion of the network. MAP-21 legislation now requires MPOs to reverse the emphasis to prioritize asset management and system preservation before the expansion of system facilities. With these new federal guidelines, and the requirements to maintain a fiscally constrained Transportation Improvement Plan (TIP) the MPO approached the roadway plan that meets realistic expectations.

When justifying which new road facilities to program in the regional TIP, the MPO benefits from travel demand software (Visum), which can be used to illustrate a variety of road scenarios that guide the decision-making process. The model can be used as a tool to help prioritize a new or proposed road project which then needs to be appropriately programmed into the MPOs TIP.

5.2 ASSET MANAGEMENT

The American Association of State Highway Officials (AASHTO), created a Transportation Asset Management (TAM) manual which provides guidance for implementing asset management concepts, principles, performance targets, strategies, tools, analysis methods, data collection, and application of management information systems. Their new guide also includes examples of tools for evaluating return on investment, economic efficiency, resource allocation and budgeting decisions. The AASHTO guide was created with the intent and purpose to improve information sharing amongst decision-makers and elected officials. According to their subcommittee on asset management they state:

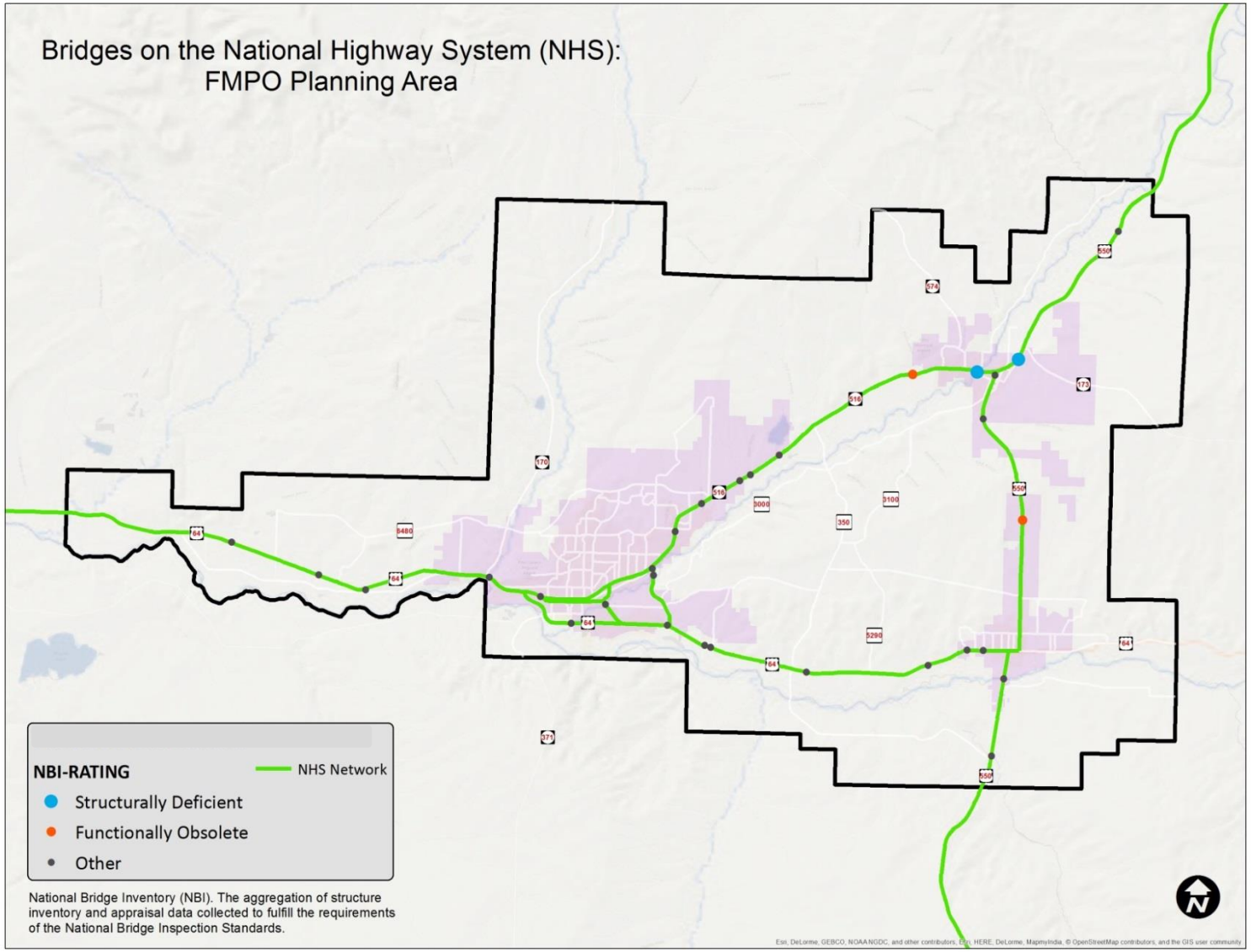
"Transportation Asset Management is a strategic process of operation, maintaining, upgrading and expanding physical assets effectively throughout their lifecycle. It focuses on business and engineering practices for resource allocation, and utilization, with the objective of better decision making based on quality information and well defined objectives."

Some of the basic questions in regards to asset management are:

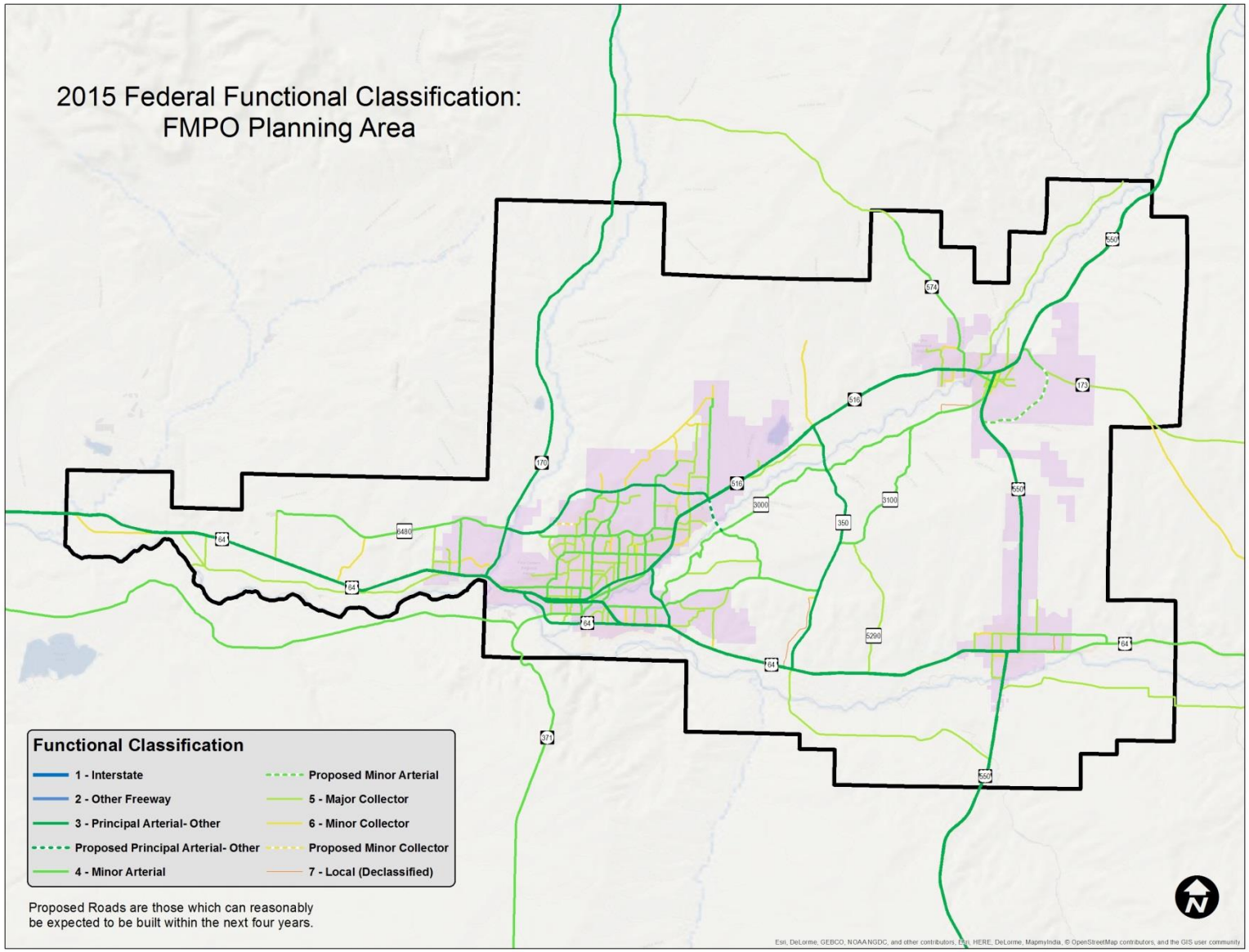
- What is the current state of physical assets?
- What are the required levels of service and performance delivery?
- Which assets are critical to sustained performance?
- What are the best investment strategies for operations, maintenance, replacements, and improvement?
- What is the best long-term funding strategy?

In addition to FHWA requirements, NMDOT planning division will be developing an asset management tier level system which prioritizes the road facilities that will need capital investments to maintain a system of good repair. The MPO will need to consider using state and federal funds to help maintain these facilities and ensure they are programmed appropriately in the TIP. Often times, there is a temptation to approach an asset maintenance program similar to how some motorist would treat their vehicles; that is drive it into the ground before replacing it. The approach unfortunately creates an overbearing cost burden on the MPOs limited financial resources. Preserving and renewing a road structure over time is a far better and cost effective approach when attempting to stretch federal state and local dollars.

Map 5-1, Bridge Needs on the National Highway System in the FMPO Area



Map 5-2, Roadway Functional Classification in the FMPO Area



5.3 ROADWAY FUNCTIONAL CLASSIFICATION

MAP-21 Federal legislation uses functional class to determine eligibility for under the Federal-Aid program. Under this program, "Federal-Aid highway funds are authorized by Congress to assist the States in providing for construction, reconstruction and improvement of highways and bridges on eligible Federal-Aid highway routes and for other specific purpose programs and projects."

These Federal-Aid highways include all National Highway Systems (NHS) routes other roads functionally classified as Interstate, Other Freeways & Expressways, Other Principal Arterials, Minor Arterials, Major Collectors, & Urban Minor Collectors.

5.4 STATE USES OF FUNCTIONAL CLASSIFICATION

State DOTs use functional classification in many decision-making processes for important business areas. These uses are described below (Source: FHWA Highway Functional Classification Concepts, Criteria, and Procedures Manual (2013 Edition)).

- **Program and Project Prioritization-** functional classification is used to prioritize expenditures of projects to maintain the state's transportation network.
- **Asset Management-** functional classification is used to support asset management to protect the state's most valuable/used assets.
- **Safety Programs-** functional classification is used to evaluate and make improvements to state's safety programs. For instance, the type of roadway may be considered when evaluating the significance of crash rates on a particular highway.
- **Highway Design-** functional classification impacts the allowable highway design standards such as speed limit, lance width, and horizontal and vertical alignment.
- **Bridge Programs-** functional classification is used in a state's bridge program to make decisions as where one-lane bridges are acceptable (e.g., on local roads with low traffic volumes).
- **Traffic Control-** functional classification may be used to determine the most appropriate intersection control measures to use.
- **Maintenance-** functional classification may also impact scheduling of general roadway maintenance and snow/ice removal in inclement weather.

5.5 THE MPO's USES OF FUNCTIONAL CLASSIFICATION

At the regional level, functional class help determine which roadways should be included in a regional transportation system and which ones might require asset management priorities and maintenance upgrades. Furthermore, functionally classified roadways describe the various levels of vehicular mobility. Using functional class in the transportation planning process ensures that adjacent land uses and local development are compatible with both existing and future transportation needs. Table 5-1 lists the descriptions and functions of different roadway classifications.

Table 5-1, Roadway Functional Classifications, Descriptions and Functions

FUNCTIONAL CLASS	DESCRIPTION	FUNCTION
Interstate	Highest Class of Arterials; Abutting land uses are NOT directly served by them. Higher speed limits, higher vehicle miles traveled (VMT) and more travel lanes.	Interstates are the highest classification of Arterials and were designed and constructed with mobility and long-distance travel in mind
Principal Arterial – Other Freeway & Expressways	Very similar to interstates, with travel lanes separated by some type of physical barrier, abutting land uses NOT directly served by them. Higher speeds and more lanes higher vehicle miles traveled (VMT).	Roadways in this functional classification category look very similar to Interstates. While there can be regional differences in the use of the terms 'freeway' and 'expressway'.
Principal Arterial- Other	These roadways serve major centers of metropolitan areas, provide a high degree of mobility and can also provide mobility through rural areas.	Unlike their access-controlled counterparts, abutting land uses can be served directly. Forms of access for Other Principal Arterial roadways include driveways to specific parcels and at-grade intersections with other roadways
Minor Arterial	Minor Arterials provide service for trips of moderate length, serve geographic areas that are smaller than their higher Arterial counterparts and offer connectivity to the higher Arterial system.	In an urban context, they interconnect and augment the higher Arterial system, provide intra-community continuity and may carry local bus routes.
Major Collector	Major Collector routes are longer in length; have lower connecting driveway densities; have higher speed limits; are spaced at greater intervals; have higher annual average traffic volumes; and may have more travel lanes.	Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas, penetrate residential neighborhoods, often for significant distances, distribute and channel trips between Local Roads and Arterials, usually over a distance of greater than three quarters of a mile, operating characteristics include higher speeds and more signalized intersections
Minor Collector	Serve both land access and traffic circulation in lower density residential and commercial/industrial areas.	Penetrate residential neighborhoods, often only for a short distance, distribute and channel trips between Local Roads and Arterials, usually over a distance of less than three-quarters of a mile, operating characteristics include lower speeds and fewer signalized intersections
Local	Locally classified roads account for the largest percentage of all roadways in terms of mileage. They are not intended for use in long distance travel.	Provide direct access to adjacent land, provide access to higher systems, carry no through traffic movement, constitute the mileage not classified as part of the Arterial and Collector systems.

5.6 CONGESTION

Congestion can have a negative effect on the quality of life of our residents. One of the first things motorist think of in regards to congestion is the delay time in their daily commute. The inability to calculate travel times due to congestion also adds to the level of frustration by the motorist. Stop and go traffic also burns fuel at a faster rate and contributes to higher levels of air pollution. All too often, pent up frustration can lead to road-rage which can lead to hazardous driving conditions which also exacerbates congestion. In these conditions, it would be all but impossible for emergency response vehicles to access a needed conflict point. Fortunately, the FMPO planning area does not seem to experience the levels of traffic and congestion when compared to other communities our size and larger.

5.7 INDUCED DEMAND

The term "induced" implies that one condition is caused by another imposing condition. As it relates to transportation and the practice of adding capacity, i.e. adding more lanes to an already congested roadway, many economists and engineers argue that the newly added lanes induce more traffic thereby exacerbating the problem they are trying to solve. Some refer to this strategy as "building our way out of traffic".

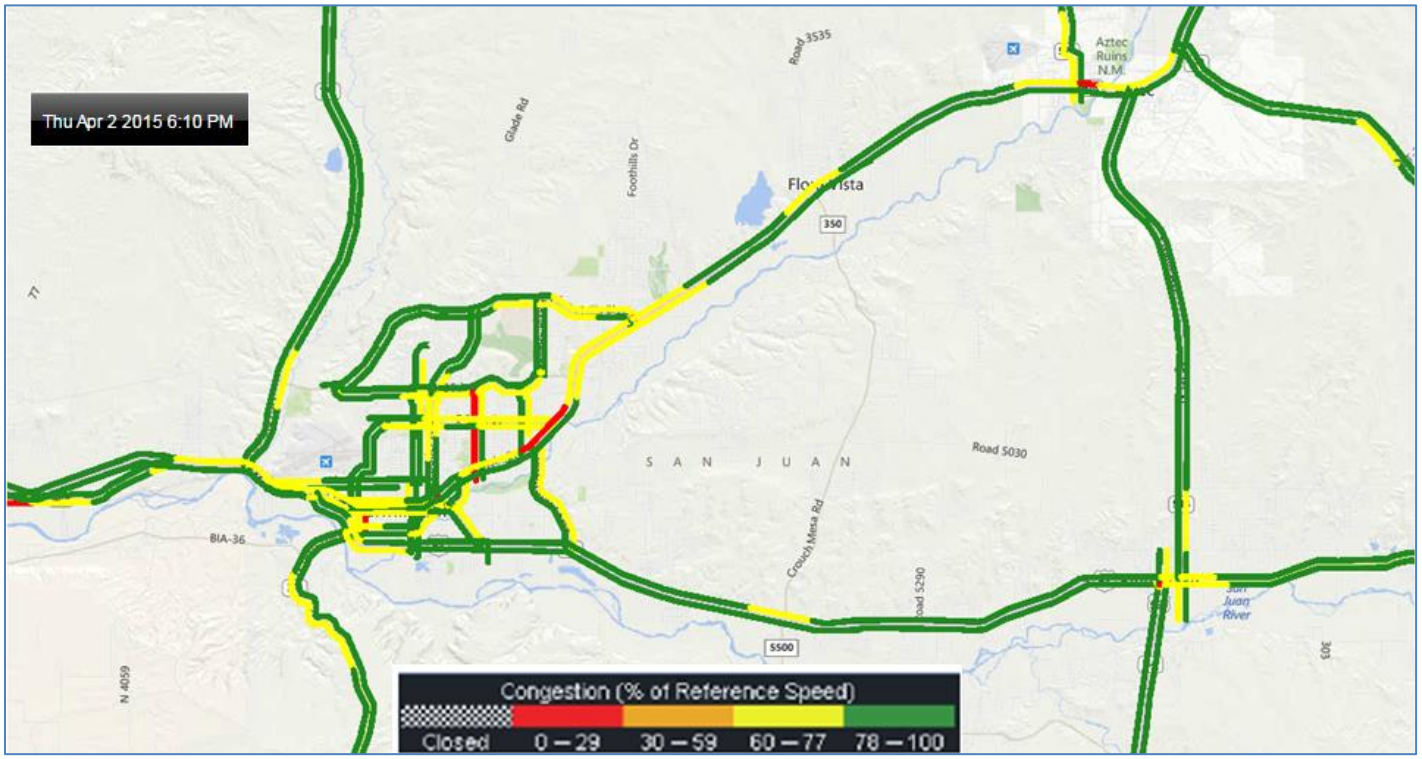
In 2009, economists Matthew Turner of the University of Toronto and Gilles Duranton of the University of Pennsylvania conducted a study comparing new roads and highways built in different U.S. cities between 1980 and 2000, and the total number of miles driven in those cities over the same period. Their research revealed a perfect one to one relationship.

"If a city had increased its road capacity by 10 percent between 1980 and 1990, then the amount of driving in that city went up by 10 percent. If the amount of roads in the same city then went up by 11 percent between 1990 and 2000, the total number of miles driven also went up by 11 percent. It's like the two figures were moving in perfect lockstep, changing at the same exact rate… Interestingly, the effect works in reverse, too. Whenever some city proposes taking lanes away from a road, residents scream that they're going to create a huge traffic snarl. But the data shows that nothing truly terrible happens. The amount of traffic on the road simply readjusts and overall congestion doesn't really increase." (http://www.wired.com/2014/06/wuwt-traffic-induced-demand/)

As communities seek to add new roads to the network in the region, careful considerations should be taken to ensure adding capacity will result in the desired outcomes of reducing congestion. The use of the MPOs Travel Demand Modeling software can be utilized as a tool in the decision making process to illustrate potential outcomes of different road scenarios. In the case of US 64 mentioned at the beginning of this chapter, the travel demand modeling conducted in the early 2000s did not consider the impacts

of creating improved connectivity to the network by modeling the build-out of the Piñon Hills Bridge project. Modeling results conducted by the MPO revealed a decrease in congestion and AADT figures on US-64. Not only would the Piñon Hills Bridge project have reduced the issues of congestion, but would have proved a wise benefit cost scenario in favor of the bridge project by almost $40M. Map 5-3 shows a screenshot from the FMPO travel demand model of congestion as a percentage of reference speed.

Map 5-3, Roadway congestion as a percent of reference speed



5.8 YEAR 2040 ROADWAY SYSTEM

During the development of the previous version of the MTP, the MPO identified several regional roadways which may be needed to accommodate future growth. The future year roadway system was developed using an extensive public involvement process and technical analysis. Working from the current functionally classified roadway system as an overall framework, a future year roadway

network was developed. Arterials and collector streets in the MPO study area comprise the future year roadway networks. Emphasis was placed on making intercity connections for Aztec, Bloomfield and Farmington, in light of expected growth within the cities and on Crouch Mesa (the triangle-shaped area of unincorporated land in the center of the three cities). Table 5-2 describes project details for the six regional projects for the MPO region. The five roadway scenarios are illustrated on the following pages.

Table 5-2, Regional Roadway Scenario Projects

Facility & Location	Scenario #1	Scenario #2	Scenario #3	Scenario #4	Scenario #5
#9 (A, B & C) - Piñon Hills Ext./CR 3900 – East Main to CR 390	X	X	X	X	X
# 17 (A, B & C) - US 64 widening – Browning Pkwy to US 550	X	X		X	
# 15 (A & B) - East Arterial (south) – US 550 to NM 173	X	X	X	X	X
# 16 - East Arterial (north) – NM 173 to US 550				X	X
# 14 - Highline Road – CR 350 to US 550	X	X	X	X	X
# N8 - Piñon Hills Ext to CR 350 Connector	X			X	X

The Federal Highway Administration (FHWA) is actively encouraging and supporting scenario planning. FHWA believes that scenario planning can help citizens, businesses, and government officials understand the impacts of growth, especially the relationship between transportation and the social, environmental and economic development of regions. FHWA sees scenario planning as an enhancement of, not a replacement for, the traditional transportation planning process. It enables communities to better prepare for the future. Scenario planning highlights the major forces that may shape the future and identifies how the various forces might interact, rather than attempting to predict one specific outlook. As a result, regional decision makers are prepared to recognize various forces to make more informed decisions in the present and be better able to adjust and strategize to meet tomorrow's needs.

Other road projects identified in the MTP update process are included in Tables 5-3 to 5-5. Projects listed in Tier 1 are expected to be constructed within the next five years and have full or partial funding (for more information on funding, see Chapter 13, Financial Plan). Projects in Tier 2 are expected to be constructed in 5 to 15 years, and those in Tier 3 represent the far time horizon of the plan. They may be built 15 years or more from today. A map of all roadway projects identified in the MTP is show on Map 5-X. The timing and construction of all projects is dependent on demonstrated need and the availability of funding, both to construct and to maintain the facility.

Map 5-4, Roadway Projects by Tier

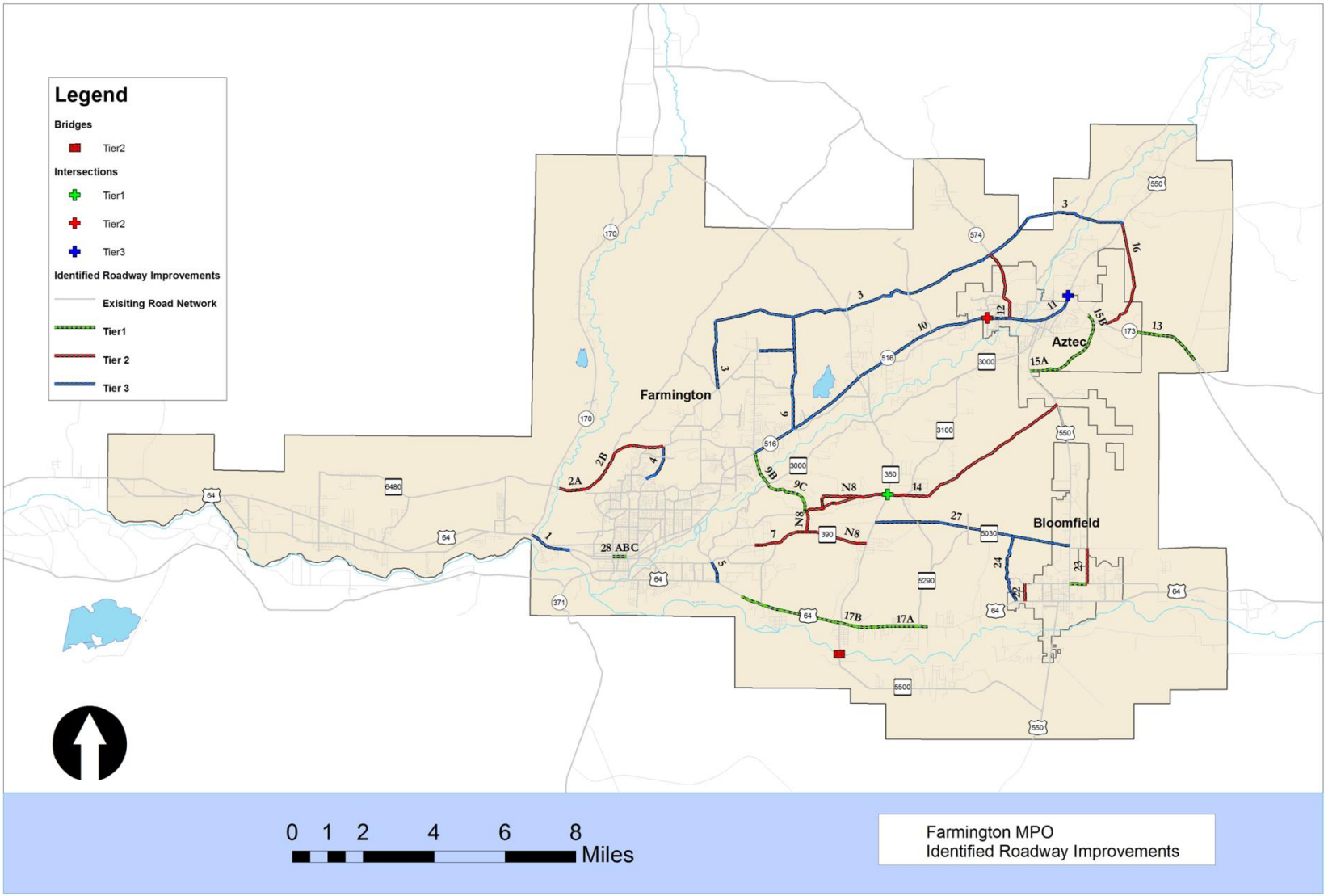


Table 5-3, Tier 1 Roadway Projects

Map #	Facility Name	Entities	Termini	Project Description	Length (feet)	Est. Project Cost	Draft Tier in 2040 MTP
9A	East Pinon Hills Blvd Extension (Phase I)	Farmington	NM 516 to Hubbard	Full rebuild of the Intersection of Piñon Hills and NM 516; Extension of Piñon Hills Blvd to include earthwork, asphalt, street lighting, drainage improvements and signalization upgrades.	4440	$3,950,000	Tier 1
9B	East Pinon Hills Blvd Extension (Phase II)	Farmington, County	Hubbard to South Side River Road (CR 3000)	Includes earthwork, asphalt, intersection lighting, bridges over the Animas River and oxbow, drainage improvements, environmental mitigation.	7340	$13,265,454	Tier 1
9C	East Pinon Hills Blvd Extension (Phase III)	County	South Side River Road (CR 3000) to CR 390	Includes earthwork, asphalt, intersection lighting, drainage improvements, environmental mitigation.	11620	$8,000,000	Tier 1
13	NM 173	NMDOT	MP 2 to NM 575	Safety Improvements	7920	$2,110,000	Tier 1
15A	East Arterial Route Phase 1B	Aztec	US 550 to Legion Road	Construct new 2 lane road (preserve ROW for 2 additional lanes)	14784	$3,500,000	Tier 1
15B	East Arterial Route Phase 2	Aztec	Legion Road to NM 173	Construct new 2 lane road (preserve ROW for 2 additional lanes)	-	$7,319,750	Tier 1
17A	US 64 Phase IV	NMDOT	Mile post 57.8 to 60.2	Widen to 6 lanes	12670	$15,600,000	Tier 1
17B	US 64 Phase V	NMDOT	Mile post 56 to 58	Widen to 6 lanes	10560	$17,655,750	Tier 1
17C	US 64 Phase VI	NMDOT	Mile post 54 to 56	Widen to 6 lanes	10560	$9,000,000	Tier 1
18	CR 350/ CR 390 Intersection	NMDOT	500' South of intersection on CR 350 to 500' North of intersection on CR 350	Preliminary Engineering, ROW acquisition, and construct improvements CR 350/CR390 intersection-500ft North and South of intersection on CR 35, 500ft west of intersection on CR 390.	0	$650,000	Tier 1
21	East Blanco	Bloomfield	US 550 to Saiz Lane	TWLTL; sidewalks; bridge upgrades	2680	$2,000,000	Tier 1
26	Bridge Preservation: US 550 #9178 & #9179	NMDOT	MP 169.5	Bridge Maintenance and Preservation, resurface bridge.	0	$260,000	Tier 1
28A	Downtown Main Street Complete Streets Project (Phase I)	Farmington	Wall Ave to Orchard Ave	Roundabouts, intersection improvements, curb, gutter, and sidewalk, lane reduction and parking reconfiguration.	600	$2,029,920	Tier 1
28B	Downtown Main Street Complete Streets Project (Phase II)	Farmington	Allen Ave to Behrend Ave	Roundabouts, intersection improvements, curb, gutter, and sidewalk, lane reduction and parking reconfiguration.	450	$1,522,440	Tier 1
28C	Downtown Main Street Complete Streets Project (Phase III)	Farmington	Locke Ave to Auburn Ave	Roundabouts, intersection improvements, curb, gutter, and sidewalk, lane reduction and parking reconfiguration.	450	$1,522,440	Tier 1
					Total Est. Project Cost	$88,385,754	

Table 5-4, Tier 2 Roadway Projects

Map #	Facility Name	Entities	Termini	Project Description	Length (feet)	Est. Project Cost	Draft Tier in 2040 MTP
25	Bridge Improvement on CR 5500	County	Bridge 8130 on CR 5500	Replacement of 6-span bridge, wider alignment, add ped facilities	238	$3,600,000	Tier 2
14	Highline Road	All	CR 3950 to US 550	Construct new 2 lane road	27880	$15,000,000	Tier 2
N8	Piñon Hills Blvd Extension to CR 350 Connector	County	Corridor to be determined	Construct a facility to connect Piñon Hills Blvd Extension to Highline Rd	8980	$5,250,000	Tier 2
16	East Arterial (North)	Aztec	NM 173 to US 550	Construct new 2 lane road (preserve ROW for 2 additional lanes)	19025	$13,750,000	Tier 2
7	Wildflower Pkwy	FarmingtonCounty	Approx. Yarrow to CR 3900	Upgrade road - add TWLTL, curb/gutter, sidewalk, bike lanes	4760	$3,125,000	Tier 2
12	Lt Plant Rd	Aztec	NM 516 to approximately Aztec City Limits	Upgrade road to Minor Arterial; curb/gutter, sidewalks	5000	$3,750,000	Tier 2
2A	Piñon Hills Blvd	Farmington	Sports Complex to 30th St	Widen to 4 lanes	3480	$1,600,000	Tier 2
2B	Piñon Hills Blvd	Farmington	30th St to Butler	Widen to 4 lanes	15030	$7,000,000	Tier 2
22	Bergin Ln	Bloomfield	US 64 to West Blanco	Widen existing 2 lanes; curb, gutter, sidewalks	2580	$2,000,000	Tier 2
23	Saiz Ln	Bloomfield	E Blanco to Arizona	Widen existing 2 lanes; curb gutter, sidewalk	5250	$4,375,000	Tier 2
20	Intersect'n of Oliver and NM 516	Aztec	Distance on side streets TBD				Tier 2
19	Intersect'n of NM 173 and US 550	Aztec	Distance on side streets TBD				Tier 2
					Total Est. Project Cost	$59,450,000	

Table 5-5, Tier 3 Roadway Projects

Map #	Facility Name	Entities	Termini	Project Description	Length (feet)	Est. Project Cost	Draft Tier in 2040 MTP
10	NM 516	Farmington, Aztec, County	Piñon Hills to Lt Plant Rd	Widen to 6 lanes; implement access management; install traffic signals; pedestrian facilities	43930	$55,000,000	Tier 3
27	CR 5030	County	CR 350 to US 550	Construct new 2 lane road	29460	$19,200,000	Tier 3
24	Newby Ln/ CR 5075	Bloomfield	US 64 to CR 5030	Upgrade road to Collector	10500	$6,720,000	Tier 3
5	Browning	Farmington	US 64 to Southside River Road	Widen to 6 lanes	9504	$5,280,000	Tier 3
4	Butler	Farmington	38th St to Piñon Hills Blvd	Widen to 4 lanes, add bike lanes	6105	$5,120,000	Tier 3
6	New Road east of Foothills	Farmington	NM 516 to Northern Route	Construct 2 lane road	15950	$10,080,000	Tier 3
1	US 64	Farmington	NM 170 to Murray	Widen to 6 lanes	10450	$4,800,000	Tier 3
3	Northern Route	Farmington, Aztec, County	East Farmington to US 550	Construct new 2 lane road from Farmington to Aztec	61600	$70,000,000	Tier 3
11	NM 516/US 550	Aztec	Lt Plant Rd to NM 173	Widen to 6 lanes and add accel/decel lanes	10454	$30,000,000	Tier 3
					Total Est. Project Cost	$206,200,000	

5.9 SECURING FUNDING FOR PROJECTS

Initial analysis has shown that these new roadway projects can provide relief to existing state-owned highways by redistributing traffic volumes and patterns. New road facilities also provide the opportunity for implementing walking and biking facilities which can be difficult due to right-of-way constraints on existing infrastructure. Performing cost/benefit analyses will become essential to show the importance of investing federal funding into these regional priorities.

The MPO will work in cooperation with NMDOT to secure federal funding for these projects for further planning and engineering analysis and eventually for construction. These projects will be incorporated into the Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) so that the project development process can be started.
Because the Federal Gas Tax has not been indexed with inflation since 1993, the purchasing power of 2015 dollars compared to 1993 dollars has an estimated ~38% shortfall. The actions of local entities both locally and throughout the state respond to this shortfall whether through local bonds or state-level politics lobbying, will have the greatest impact on funding regional projects. In addition to state-level funds, the Federal government will issue a new transportation bill with each new presidential administration. The house and senate will also drive how much funding States and MPOs receive based on legislative actions at the highest levels.

5.10 MAJOR THOROUGHFARE PLAN

The area's current regional road network is composed primarily of Principal and Minor Arterial streets and provides the necessary transportation support and access to and from local land uses. Since many corridors are constrained from acquiring additional right-of-way, much of the future demand will likely have to be accommodated through a better connected and more efficient arterial street system.

During development of the MTP, many current and future roadways were identified that could become part of a Major Thoroughfare Plan for the Farmington MPO. As a by-product of the 2035 MTP development process, a Farmington MPO Major Thoroughfare Plan was established via a collaborative process in which all member entities reviewed and agreed to the existing and future expansion of the classified roadway network. Once the Major Thoroughfare Plan was adopted by the MPO Policy Committee it was adopted by each member entity's governing body. It is anticipated that this regionally adopted Major Thoroughfare Plan will allow for corridor preservation and will lead towards a coordinated and cooperative implementation of future roadway projects. With an adopted thoroughfare plan, local planning staffs and developers can make better decisions about the expansion of commercial and residential development that integrates transportation and land use planning.

5.11 ROADWAY POLICIES

Developing and maintaining a comprehensive network of streets and highways that supports the needs of automobile, transit, bicycle, and pedestrian traffic is critical to reducing congestion, improving safety, and increasing mobility within the MPO region. As population and employment continue to grow in the Farmington metropolitan area, a higher burden will be placed on the transportation system. The proposed policies below will assist in developing the best transportation system for the area:

- Ensure an asset management plan is established regionally and in collaboration with NMDOT, which will allow for the prioritization of road maintenance projects that best allocate limited funds
- Ensure travel demand modeling practices apply scenario planning as a tool in the decision making process for all new road project proposals. Evaluate connectivity within the network as a means to improve efficiency before considering adding capacity to our high volume arterials.
- Develop a roadway system that is compatible with the needs of other modes such as bicycles, pedestrians, public transportation and truck freight
- All new arterial roads shall be controlled using access management standards
- Consider safety in the project selection process
- Require land developers to preserve the necessary right-of-way in future travel corridors
- Require private developer contributions in roadway construction in undeveloped areas through the development process
- When approving new land development, ensure that internal, connecting and adjacent streets are able to handle the expected type and intensity of development that is proposed
- Implement access management strategies found within the FMPO Access Management Plan to improve safety and traffic flow
- Implement the Complete Streets policy and design guidelines (see Chapter 7)

5.12 ROADWAY ACTIONS

In order for the regional system to support the needs of the community and provide balanced level of service, and multi-modal transportation functionality, a number of broad actions are needed. These actions create proactive opportunities to address future transportation concerns.

- Continue the implementation of access management practices such as on US 64 as development occurs
- Develop access management corridor plans for new roads

- Collect intersection data, such as turn movement counts
- Develop intersection design standards and signal timing plans
- Analyze signal progression for new developments
- Incorporate pedestrian and transit level of service in conjunction with vehicular levels of service into the travel demand analysis conducted by the MPO