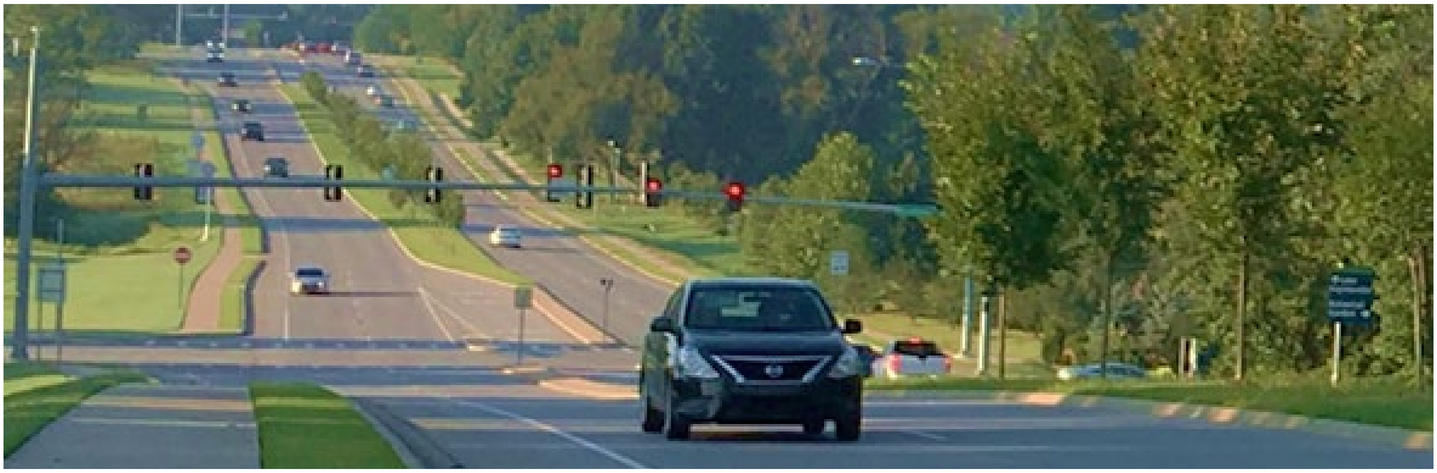


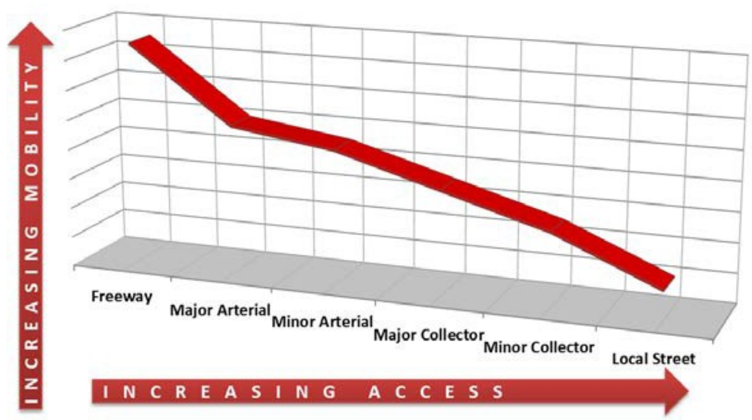
CHAPTER 8. FACILITY DESIGN, MANAGEMENT AND OPERATIONS, AND SYSTEM PERFORMANCE

TRANSPORTATION DESIGN

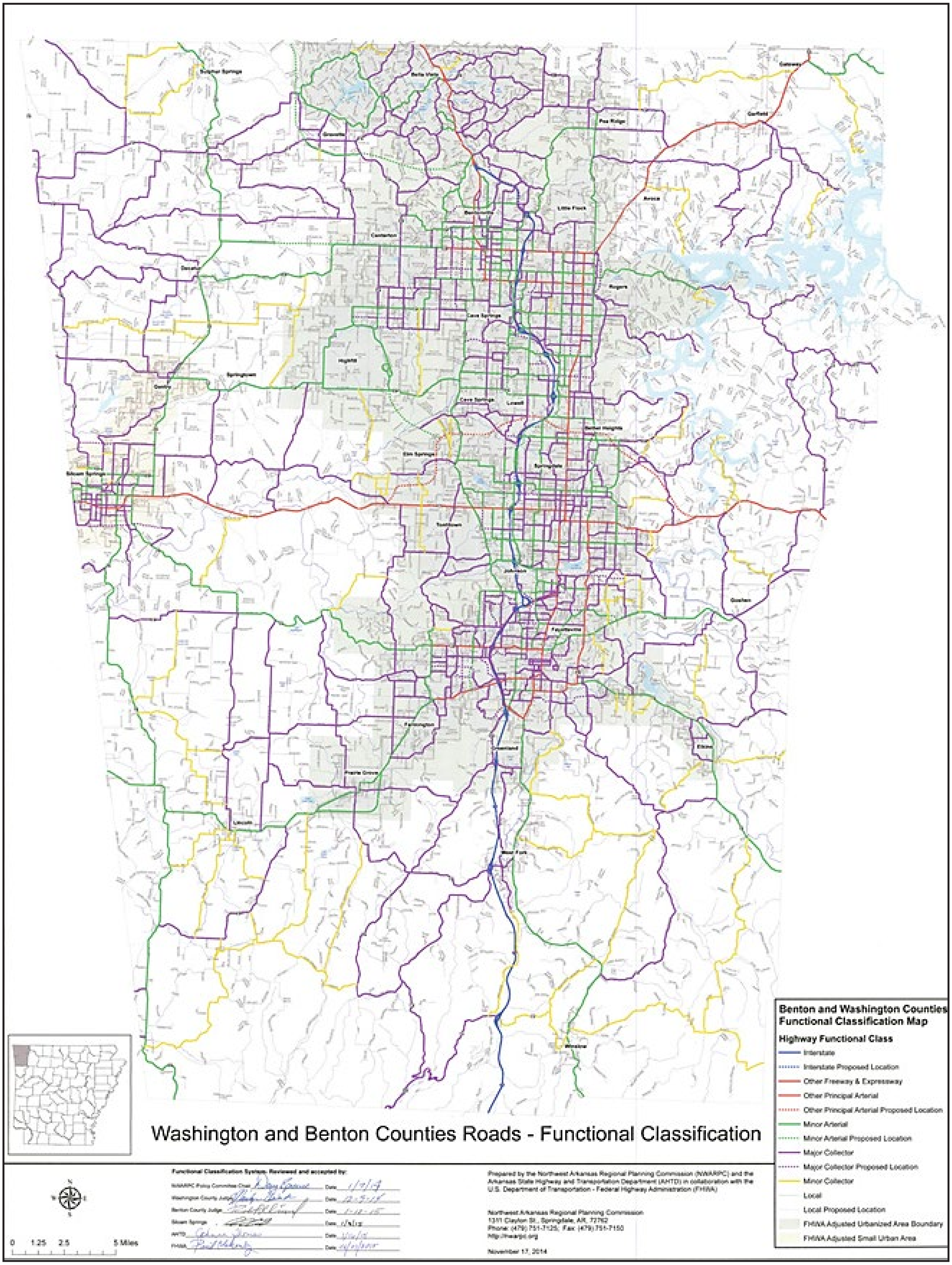
Roadway facilities are classified as Freeway/Expressways, Major Arterials, Minor Arterials, Major Collectors, Minor Collectors and Local Streets. These classifications reflect the utility of the various facilities as illustrated below, with the higher classifications more responsible for moving traffic long distances while the lower functional classes are primarily responsible for access to land. It is necessary for roadways to be on the State's functionally classified system to qualify for State and Federal funding. Map 8.1 on the next page shows the functionally classified system.

Of particular importance to the rapidly growing area of Northwest Arkansas is adequate protection of right of way and setbacks adjacent to current and proposed roads. A primary tool for this protection is the adopted master street plan of the cities and road plan of the counties.

The area's cities and counties are urged to consider the existing functionally classified system as well as the proposed 2045 network to protect the necessary rights-of-way through their adopted plan and ordinances.



It should also be noted that the cross-section designs in the 2045 MTP reflect recommended designs and that some areas of commercial or industrial development will require cross-section designs higher than the typical cross-section of the designated functional class of the roadway. Cities should identify those areas and preserve the necessary right- of-way for the higher design.



Map 8.1 - Washington and Benton Counties Functionally Classified Roads

COMPLETE STREETS

“Complete Streets” involves designing streets not just for the automobile but for all users of all ages and abilities. Generally, the elements that make up a complete street, according to the National Complete Streets Coalition, are sidewalks, bicycle lanes, shared-use paths, designated bus lanes, safe and accessible transit stops, and frequent and safe crossings for pedestrians, including median islands, accessible pedestrian signals, and curb extensions. There is no one design for complete streets since different areas have different road uses. However, all complete street designs should balance safety and convenience for everyone using the street.

The MTP recommends the development and adoption of Complete Streets policies. Complete Streets policies direct transportation planners and engineers to consistently design the right-of-way to accommodate all users – drivers, transit riders, pedestrians, and bicyclists, as well as for older people, children, and people with disabilities. Complete streets provide a safer and more accessible transportation system for all users.

The MTP identifies a series of cross-sections as a guide to implement complete streets concepts as transportation facilities are designed. The illustrations demonstrate how complete street design elements may be incorporated as part of the design process. The complete street cross-sections illustrated in the MTP are based on the following National Complete Street policy, guidance, and resources:

National Complete Streets Coalition:
http://www.smartgrowthamerica.org/complete-streets

NACTO Urban Street Design Guide:
http://nacto.org/usdg/

ITE - Designing Walkable Urban Thoroughfares: A Context Sensitive Approach:
https://www.ite.org/pub/?id=E1CFF43C-2354-D714-51D9-D82B39D4DBAD

Jurisdictions are also encouraged to implement complete streets policies. These polices are also included in the adopted Northwest Arkansas Regional Bicycle and Pedestrian Master Plan. In addition to the Northwest Arkansas Regional Bicycle and Pedestrian Master Plan, 25 individual community plans have been developed and adopted along with recommended complete streets catalyst projects. All jurisdictions making major improvements to roads shown in the Northwest Arkansas Regional Bicycle and Pedestrian Master Plan should make every effort to include bicycle and pedestrian facilities. The following sample resolution has been developed to encourage complete streets throughout the region.


Images: Rupple Road, Fayetteville AR

Sample Complete Streets Resolution for NWA Communities:

WHEREAS Complete Streets are important for our community's economy, health, mobility, and quality of life for residents, businesses and visitors,

LET IT BE RESOLVED that [Municipality / Adopting body] hereby recognizes the importance of creating Complete Streets that enable safe travel by all users, including pedestrians, bicyclists, transit riders and motorists, and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.

BE IT FURTHER RESOLVED that [Municipality / Adopting body] affirms that Complete Streets infrastructure addressing the needs of all users can be incorporated into all planning, design, approval, and implementation processes for construction, reconstruction, retrofit, maintenance, alteration, or repair of streets, bridges, or other portions of the transportation network; provided, however, that such infrastructure may be excluded, upon written approval by [insert senior manager, such as City Manager or the head of an appropriate agency], where documentation and data indicate that: 1. Use by non-motorized users is prohibited by law; 2. The cost would be excessively disproportionate to the need or probable future use over the long term; 3. There is an absence of current or future need; or 4. Inclusion of such infrastructure would be unreasonable or inappropriate in light of the scope of the project.

BE IT FURTHER RESOLVED that the head of each affected agency or department should report back to the [Adopting body] [annually / within one year of the date of passage of this resolution] regarding: the steps taken to implement this Resolution; additional steps planned; and any desired actions that would need to be taken by [Adopting body] or other agencies or departments to implement the steps taken or planned.

BE IT FURTHER RESOLVED that a committee is hereby created, to be composed of [insert desired committee composition] and appointed by [the Mayor / President of adopting body / other], to recommend short-term and long-term steps, planning, and policy adoption necessary to create a comprehensive and integrated transportation network serving the needs of all users; to assess potential obstacles to implementing Complete Streets in [Municipality]; and to suggest revisions to the [insert name of Municipality's comprehensive plan equivalent], zoning code, subdivision code, and other applicable law.

The following COMPLETE STREET cross-sections have been developed as a guide:

MINOR STREET

Description

Provides access to properties within a neighborhood or district. Not intended for long-distance auto trips.

Conforms to Minor Street dimensions of30 feet from curb-to-curb.

- Minor streets generally require no lane markings.
- Minor streets can be further optimized for bicycle travel by applying bicycle boulevard treatments (described in these design guidelines in the Northwest Arkansas Regional Bicycle and Pedestrian Master Plan).
- Parking may be permitted or prohibited based on demand and adjacent land use.

COLLECTOR STREET

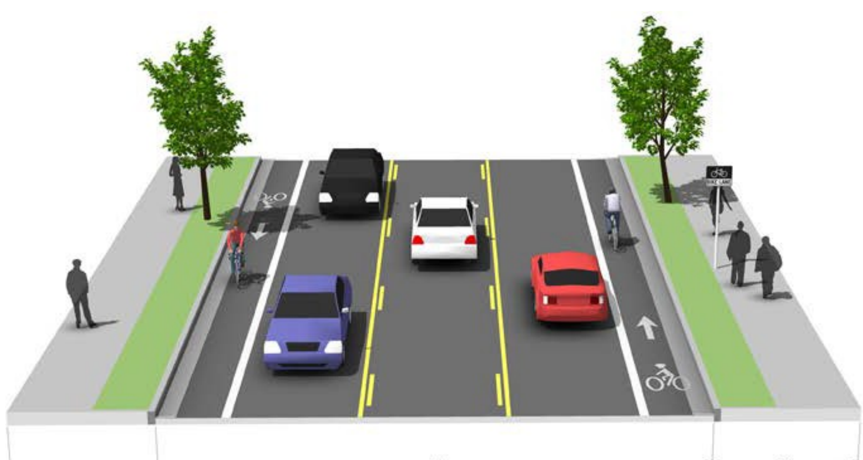
Description

Provides traffic circulation within neighborhoods, commercial and industrial areas. Collects traffic from local streets in neighborhoods and channels it into the arterial system.

Conforms to Collector Street dimensions of 40 feet from curb-to-curb.

Function

- Connections between arterials should be indirect in order to discourage use by traffic from outside theneighborhood.
- Design Service Volume: 4,000 vpd; 6,000 vpd with left turn bays
- Speed: 25-30 mph



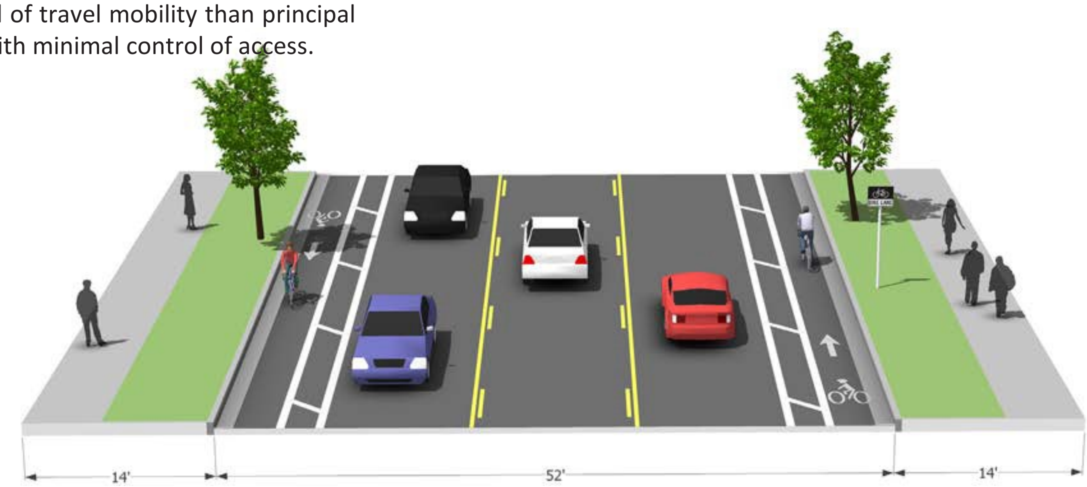
MINOR ARTERIAL

Function

Connects higher functional class facilities, activity centers, regions of the area, and major county roads at the edge of the metropolitan area. Traffic is composed predominantly of trips across and within regions of the city.

Provides service to traffic at a somewhat lower level of travel mobility than principal arterials with minimal control of access.

- Ideally does not penetrate neighborhoods.
- Design Service Volume: 12,200 vpd; 14,800 vpd with left turn bays
- Speed: 35-40 mph



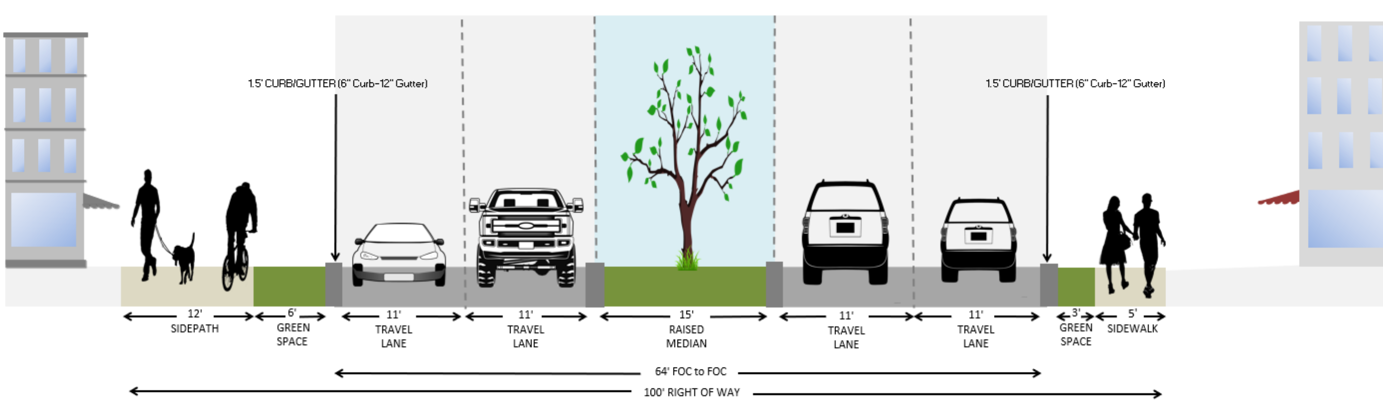
MAJOR ARTERIAL

Function

Connects freeway/expressways, rural highways at the edge of the metropolitan area, and major urban activity centers within the metropolitan area. Traffic is composed predominantly of traffic across or through the city.

Access may be controlled through medians or by the limitation of curb cuts through the orientation of access for new developments, especially residential subdivisions, to intersection cross streets.

- Design Service Volume: 17,600 vpd – 20,600 vpd with left turn lane
- Speed: 40-45 mph

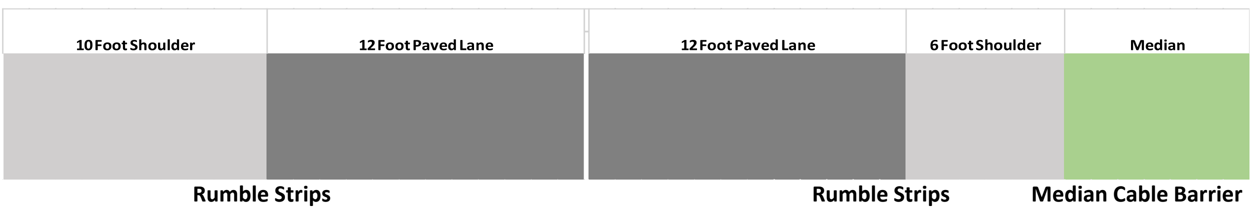


FREEWAY/EXPRESSWAY

Function

High speed, multi-lane facilities with a high degree of access control. These facilities serve the major centers of activity of the metropolitan area and are well integrated with the urban arterials and major rural arterials routes entering the region. They should provide a high level of traffic service to travelers who do not have local destinations and wish to bypass the city.

- Design Service Volume: 28,300 vpd expressway; 44,800 vpd freeways
- Speed: 55-70 MPH
- Lanes: Four or more 12-foot lanes; 10-foot outside shoulders and 6-foot inside shoulders
- Median: Either acceptable depressed median or raised median with safety barrier



ARDOT POLICY REGARDING BICYCLE LANES AND SIDEWALKS

The ARDOT Policy regarding sidewalks calls for five-foot sidewalks with a three-foot buffer between the roadway and the sidewalk. Any State Highway project with wider sidewalks or buffer zones will have a cost share requirement from the local jurisdiction. ARDOT Policy regarding bike lanes indicates that they will be considered if the facility is on an adopted master trail plan. From the ARDOT Policy:

- When bicycle accommodations are to be made on routes with an open shoulder section, the paved shoulder will be used to accommodate bicycles. Shoulder widths shall conform to the widths recommended in the American Association of State Highway and Transportation Officials (AASHTO) “A Policy on Geometric Design of Highways and Streets” 6th Edition, 2011.
- When bicycle accommodations are to be made on routes with a curb and gutter section, the bicycle lane will be in accordance with recommendations in the AASHTO Guide for the Development of Bicycle Facilities. Generally, a bicycle lane width of four feet (measured from the lane edge to the edge of the gutter) will be considered.
- If local or regional design standards specify bicycle facility widths greater than the standards noted above, the additional right-of-way and construction costs associated with the greater width shall be funded by the local jurisdiction that adopted the higher design standards.

The complete ARDOT Policy for Pedestrian and Bicycle Facilities can be found at http://www.arkansashighways.com/planning_research/statewide_planning/bicycle_pedestrian_planning/AR%20bike%20ped%20policy.pdf.

The MTP recommends that all roads (ARDOT and local) crossing named waterways prominently display a sign naming the waterway.

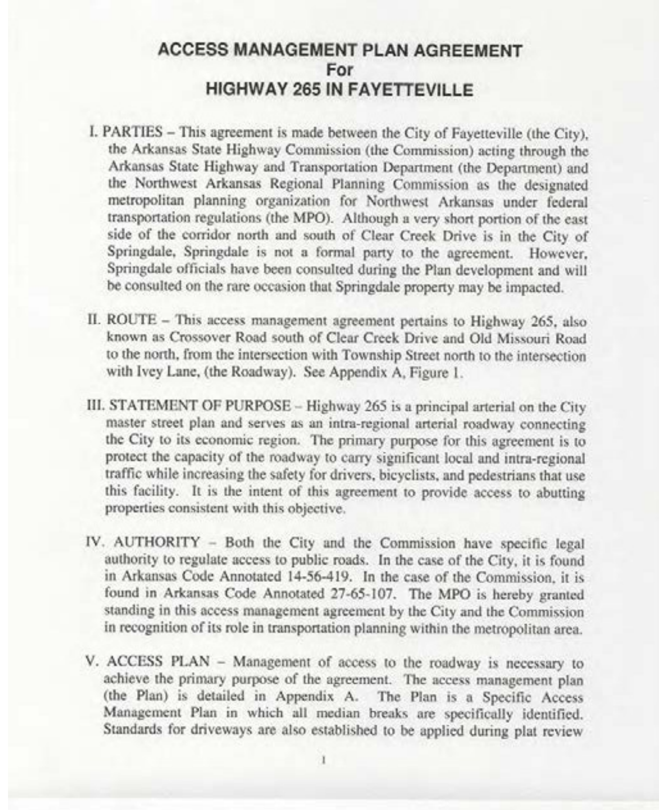
MTP recommends following AASHTO, NACTO, MUTCD, FHWA Bikeway Selection Guide and best practices for Active Transportation Facilities.

ACCESS MANAGEMENT

Access Management provides an important means of maintaining mobility, improving safety and system reliability. It calls for effective ingress and egress to a facility, efficient spacing and design to preserve the functional integrity and overall operational viability of street and road systems. Good access management promotes safe and efficient use of the transportation network.

NWARPC has worked toward development of regional policies and a Model Access Management Ordinance. The Model Access Management Ordinance is available to local governments to use and tailor to their unique and specific needs and situations. Please see the Access Management Model Ordinance.

Access Management should address, among other things, the following areas:



ACCESS MANAGEMENT PLAN AGREEMENT
For
HIGHWAY 265 IN FAYETTEVILLE

I. PARTIES – This agreement is made between the City of Fayetteville (the City), the Arkansas State Highway Commission (the Commission) acting through the Arkansas State Highway and Transportation Department (the Department) and the Northwest Arkansas Regional Planning Commission as the designated metropolitan planning organization for Northwest Arkansas under federal transportation regulations (the MPO). Although a very short portion of the east side of the corridor north and south of Clear Creek Drive is in the City of Springdale, Springdale is not a formal party to the agreement. However, Springdale officials have been consulted during the Plan development and will be consulted on the rare occasion that Springdale property may be impacted.

II. ROUTE – This access management agreement pertains to Highway 265, also known as Crossover Road south of Clear Creek Drive and Old Missouri Road to the north, from the intersection with Township Street north to the intersection with Ivey Lane, (the Roadway). See Appendix A, Figure 1.

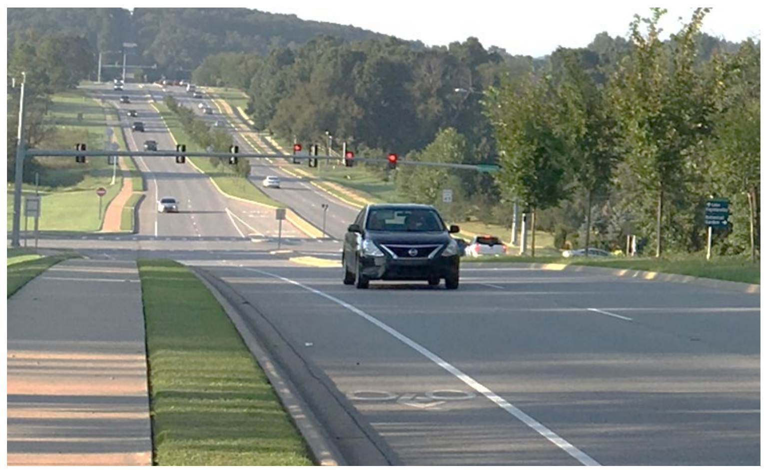
III. STATEMENT OF PURPOSE – Highway 265 is a principal arterial on the City master street plan and serves as an intra-regional arterial roadway connecting the City to its economic region. The primary purpose for this agreement is to protect the capacity of the roadway to carry significant local and intra-regional traffic while increasing the safety for drivers, bicyclists, and pedestrians that use this facility. It is the intent of this agreement to provide access to abutting properties consistent with this objective.

IV. AUTHORITY – Both the City and the Commission have specific legal authority to regulate access to public roads. In the case of the City, it is found in Arkansas Code Annotated 14-56-419. In the case of the Commission, it is found in Arkansas Code Annotated 27-65-107. The MPO is hereby granted standing in this access management agreement by the City and the Commission in recognition of its role in transportation planning within the metropolitan area.

V. ACCESS PLAN – Management of access to the roadway is necessary to achieve the primary purpose of the agreement. The access management plan (the Plan) is detailed in Appendix A. The Plan is a Specific Access Management Plan in which all median breaks are specifically identified. Standards for driveways are also established to be applied during plat review

1

- **Facility hierarchy**
- **Intersection and interchange spacing**
- **Driveway spacing**
- **Traffic signal spacing**
- **Median treatments and median openings**
- **Turning lanes and auxiliary lanes**
- **Street connections**



Highway 265, Fayetteville AR

In areas of rapid land development, it is important for jurisdictions to develop access standards that achieve a balance between property access and functional integrity of the road system. Studies show that implementing access management provides three major benefits to transportation systems:

- Increased roadway capacity
- Reduced crashes
- Shortened travel time for motorists

Effective access management will accomplish the following:

1) Limit the number of conflict points at driveway locations. Conflict points are indicators of the potential for accidents. The more conflict points that occur at an intersection, the higher is the potential for vehicular crashes. When left turns and cross street through movements are restricted, the number of conflict points is significantly reduced.

2) Separate conflict areas. Intersections created by streets and driveways represent basic conflict areas. Adequate spacing between intersections allows drivers to react to one intersection at a time and reduces the potential for conflicts.
3) Reduce interference for through traffic. Through traffic often needs to slow down for vehicles exiting, entering, or turning across the roadway. Providing turning lanes, designing driveways with appropriate turning radii, and restricting turning movements in and out of driveways allows turning traffic to get out of the way of through traffic.
4) Provide sufficient spacing for at-grade, signalized intersections. Good spacing of signalized intersections reduces conflict areas and increases the potential for smooth traffic progression.
5) Provide adequate on-site circulation and storage. The design of good internal vehicle circulation in parking areas and on local streets reduces the number of driveways that businesses need for access to the major roadway.

Access Management encompasses a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. The FHWA lists the following techniques:

- Access Spacing: Increasing the distance between traffic signals improves the flow of traffic on major arterials, reduces congestion, and improves air quality for heavily traveled corridors.
- Driveway Spacing: Fewer driveways spaced further apart allow for more orderly merging of traffic and present fewer challenges to drivers.
- Safe Turning Lanes: Dedicated left and right-turn, indirect left-turns and U-turns, and roundabouts keep through traffic flowing. Roundabouts represent an opportunity to reduce an intersection with many conflict points or a severe crash history (T-bone crashes) to one that operates with fewer conflict points and less severe crashes (sideswipes) if they occur.
- Median Treatments: Two-way left-turn lanes (TWLTL) and non-traversable, raised medians are examples of some of the most effective means to regulate access and reduce crashes.
- Right-of-Way Management: As it pertains to right-of-way reservation for future widening, good sight distance, access location, and other access-related issues.

REGIONAL ACCESS MANAGEMENT POLICIES AND OBJECTIVES

Regional Policy:
The MTP recommends that local jurisdictions, ARDOT and MoDOT implement access management techniques and plans as transportation facilities are planned, programmed, and constructed.

Regional Objectives:

- Coordinate with ARDOT and MoDOT.
- Protect the capacity of the roadway to carry significant local and regional traffic while increasing the safety for drivers, bicyclists, and pedestrians that use the facility.
- Maximize safety and capacity of the corridor in light of possible future development and/or redevelopment.
- Provide a mechanism to balance national, State, regional, and local interests in a manner that protects the function of the roadway as well as the existing and future investments in it, along with allowing reasonable economic development opportunities.
- Improve the environment for pedestrians, bicycles, and motor vehicles by reducing and consolidating driveway conflict points.
- Effective local access management requires planning as well as regulatory solutions. Where applicable, communities should establish a policy framework that supports access management in the local comprehensive plan, prepare corridor or access management plans for specific problem areas, and encourage good site planning techniques. Local comprehensive plans should establish how the community would balance mobility with access, identify the desired access management approach, and designate corridors that will receive special treatment. This may be supplemented through functional plans, such as an access management or thoroughfare plan, or through sub area plans, such as an interchange or corridor plan. By establishing the relationship between regulatory strategies and public health, safety, and welfare, the comprehensive plan can serve as the legal basis for access controls.

- Remedial access management techniques are recommended for areas that are already developed. Remedial access management focuses on reducing congestion, improving safety and improving aesthetic conditions on arterials that have developed into the familiar strip pattern with numerous separated driveways.
  - » Closing or consolidating driveways, sharing driveways, improving on-site circulation, linking adjoining parking lots, and constructing parallel access roads are common access management techniques applied in existing developed areas.
  - » Remedial access management efforts can be accomplished through alternative driveway design and applied during site plan review for a parcel as it goes through the permitting process for changes in use, expansion, etc.
  - » Another effective time to implement remedial access management techniques is when new roadway improvements are being made.

ARDOT/Local Jurisdiction Individual Corridor Access Management Plans on State Numbered Highways:

- Individual Access Management plans will specifically identify all median breaks.
- Establish standards for driveways to be applied during plat review prior to development approval by the local jurisdiction.
- Access Management Plan Agreement - Each Access Management Plan Agreement will be deemed adopted when passed in identical form by the local jurisdiction, the NWARPC acting in its capacity as MPO, and the Arkansas State Highway Commission (when the Plan applies to a State Highway).
- The Access Management Plan agreement may be terminated or modified, in whole or in part only by mutual agreement of all of the parties as evidenced by resolutions adopted by each governing body.
- Amending the Access Management Plan – An Access Management Plan amendment (variance) will be considered at the request of any of the parties to the Agreement or at the request of an applicant whose permit request has been denied by any of the parties. The proposed amendment must be adopted in identical form by the local jurisdiction, the NWARPC, and Arkansas State Highway Commission to become effective. The Access Management Plan will be updated immediately after construction of each widened portion of the roadway is completed to reflect any changes to driveway location due to that construction if necessary.

Access Management Model Ordinance

Local government adoption of implementing regulations, standards and procedures is critical to an effective regional access management effort. Without local government enforcement of implementing regulations, the regional access management effort may be undermined by inconsistent decisions during the development review and permitting process. The MTP includes an Access Management Model Ordinance whose purpose is not to identify specific projects, rather, it is to establish guidelines that will promote safe and efficient traffic flow and which will enhance and sustain economic development along the corridor over which it is laid. It is understood that the Model Ordinance may be amended or tailored to suit each local jurisdiction's individual needs. The Access Management Model Ordinance may be found at this link.

CONTEXT SENSITIVE SOLUTIONS

Context Sensitive Solutions (CSS), previously known as Context Sensitive Design, is another "alternative approach" to transportation development that has shown very promising results throughout the country. By resolving design issues in the beginning of a transportation project much time and money can be saved. The FHWA defines CSS as: "a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting. It is an approach that leads to preserving and enhancing scenic, aesthetic, historic, community, and environmental resources, while improving or maintaining safety, mobility, and infrastructure conditions." For more information go to this link.

The process differs from traditional processes in that it considers a range of goals that extends beyond the transportation problem. It includes goals related to community livability and sustainability, and seeks to identify and evaluate diverse objectives earlier in the process and with greater participation by those affected. The result is greater consensus and a streamlined project during later stages of project development and delivery. And although CSS processes are often associated with design, the approach is most effective when used during each step of planning and project development – from long-range transportation plans to individual corridor strategies.

While every project has unique circumstances, all CSS processes should build consensus around these issues before solutions are identified:

- Project context, including geography and community values.
- Problem to be addressed.
- Implementation plan and decision-making process and roles.
- Vision, goals, and evaluation factors.

Once stakeholders agree on these, the team can begin to identify and evaluate alternatives and make decisions. The steps for building agreement are flexible and can be adapted to suit individual projects. At the heart of the approach is the methodical integration of diverse values at each step of the process.

Figure 8.1 illustrates a CSS process that becomes less contentious as the design becomes more complex. Public and stakeholder involvement might be a primary activity early in the project, but by the time engineers are producing detailed plans, stakeholders only wish to be kept informed about progress and involved when changes arise. This front-loaded community participation and decision-making process allows stakeholders to influence outcomes by raising issues early when they can still be addressed.

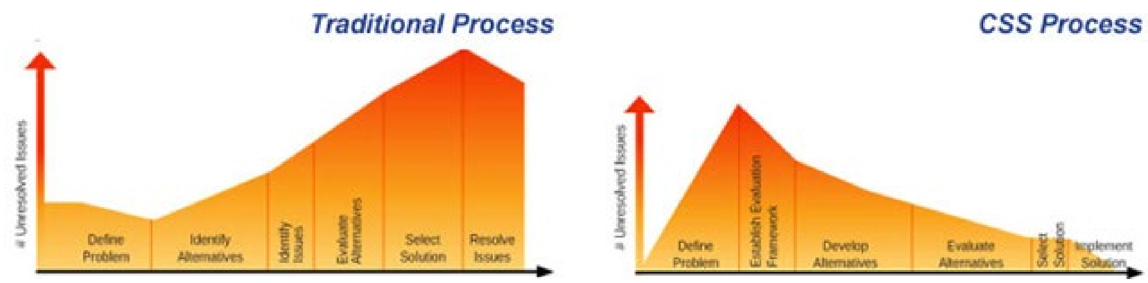


Figure 8.1 - CSS Process

Characteristics of the CSS Products or Design:

- The project is in harmony with the community, and it preserves environmental, scenic, aesthetic, historic, and natural resource values of the area.
- The project is a safe facility for all users and the community.
- The project solves problems and satisfies the purpose and needs identified by a full range of stakeholders.
- The project exceeds the expectations of both designers and stakeholders and is perceived as adding lasting value to the community as a whole.
- The project involves efficient and effective use of resources (time, budget) of all involved parties.

These before and after photos from the College Ave/Hwy. 71B (Fayetteville, Arkansas) illustrate how context sensitive projects improve safety and mobility for a variety of users. The photo illustrates improved sidewalks, street trees, and tree-lined boulevard.

CSS projects consider new and emerging technologies, funding sources, and public policy issues aimed at addressing major drivers such as energy supply, climate change, and sustainability initiatives. CSS projects also address livability issues such as bicycle and pedestrian facilities, transit, and multimodal connections. Additionally, CSS projects embrace sustainability principles such as stormwater management, water quality, and the use of recycled materials throughout their lifecycles.

Given the potential of avoiding transportation project delays and costs, and at the same time meeting the needs of interested individuals and stakeholders, the CSS process would be an important alternative approach for the Northwest Arkansas region to consider adopting into the planning process.

REGIONAL TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO)

Transportation Systems Management and Operations (TSMO) is a set of strategies that focus on operational improvements that can maintain and even restore the performance of the existing transportation system before extra capacity is needed. The goal here is to get the most performance out of the transportation facilities already in place. This requires knowledge, skills, and techniques to administer comprehensive solutions that can be quickly implemented at relatively low cost. This may enable transportation agencies to “stretch” their funding to benefit more areas and customers. TSMO also helps agencies balance supply and demand and provide flexible solutions to match changing conditions. MAP-21, SECTION 1103 (a) (30) (A) defines TSMO as “an integrated set of strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system”.

The benefits to TSMO can include:

- Improved quality of life
- Smoother and more reliable traffic flow
- Improved safety
- Reduced congestion
- Less wasted fuel
- Cleaner air
- Increased economic vitality
- More efficient use of resources (facilities, funding)

TSMO looks at performance from a systems perspective, not just one strategy, project or corridor. This means that these strategies are coordinated with others across multiple jurisdictions, agencies, and modes. Integration views the surface transportation network as a unified whole, making the various transportation modes and facilities work together and ultimately perform better. TSMO not only provides public agencies with a growing toolbox of individual solutions but encourages combining them to achieve greater performance on the entire system. Integration can happen on multiple levels:

- **System** – Implementing and combining strategies as a corridor or region matures in needs.
- **Technical** – Developing a framework used to support information sharing between technology deployed on the system.
- **Cultural** – Developing a workforce that values and prioritizes the use of TSMO solutions across multiple disciplines.
- **Operational** – Coordinating day-to-day operational strategies so that corridor, region, or system-wide objectives are achieved.
- **Institutional** – Incorporating TSMO policies and processes into an agency's normal way of doing business. This step includes TSMO integration with various disciplines, such as planning, program management and design, to support long-term goals for the transportation system. This can be applied both internally and externally.

TSMO includes efforts to operate the multimodal transportation system and activities to manage travel demand, thus crossing over political, modal, and jurisdictional boundaries. TSMO expands beyond just roads. It emphasizes the door-to-door experience, regardless of the modes of travel. TSMO requires agencies to look beyond a project or a corridor and consider the impacts of the entire transportation system. This involves coordination and collaboration among multiple stakeholders, such as federal, state, and local agencies, the first responder community, and the private sector to achieve seamless interoperability.

TSMO Strategies and Solutions

Below is a list of examples of TSMO strategies. These are not all inclusive:

- Work Zone Management
- Traffic Incident Management
- Special Event Management
- Road Weather Management
- Transit Management
- Freight Management
- Traffic Signal Coordination
- Traveler Information
- Ramp Management
- Congestion Pricing
- Active Transportation and Demand Management
- Integrated Corridor Management
- Access Management
- Improved Bicycle and Pedestrian Crossings
- Connected and Automated Vehicle Deployment

Many agencies are already doing some of these activities. In addition, many of them specifically address congestion due to non-recurring events in addition to daily rush hour traffic. TSMO addresses both types of congestion and brings the strategies together to maximize the safety, mobility and reliability of the transportation system. Many of them require coordination across multiple jurisdictions and modes. While each individual strategy can be beneficial, TSMO means they are applied with consideration of the entire transportation, not just one specific location. Many of these strategies can be applied to urban, suburban, and rural environments.

In August 2020, NWARPC and ARDOT signed an agreement to develop a TSMO plan for NWARPC. Once the Plan is complete the MTP will be amended to include it. Along with the TSMO Plan the 2007 Intelligent Transportation System Plan will be updated and the 2015 Congestion Management Process will be updated.

BETWEEN

THE NORTHWEST ARKANSAS REGIONAL PLANNING COMMISSION

AND

THE ARKANSAS DEPARTMENT OF TRANSPORTATION

In Cooperation with the
U.S. Department of Transportation, Federal Highway Administration

RELATIVE TO

Development of a **Regional Transportation Systems Management and Operations (TSMO) Plan and Intelligent Transportation Systems (ITS) Architecture Update** for Northwest Arkansas (hereinafter called the "Project").

WHEREAS, TMSO strategies utilize ITS to maximize the efficiency of system operations; and

WHEREAS, ITS architectures are required by the Federal Highway Administration (FHWA) in order to utilize federal funding on ITS projects; and

WHEREAS, the Northwest Arkansas regional ITS architecture, developed by the Northwest Arkansas Regional Planning Commission (hereinafter called the "NWARPC") and the Arkansas Department of Transportation (hereinafter called the "Department) in partnership, was completed in 2007; and

WHEREAS, the NWARPC has proposed a partnering arrangement with the Department to fund a regional TSMO plan and ITS architecture update; and

WHEREAS, the Department recognizes the benefits of collaborating with local and regional jurisdictions to preserve and maximize highway investments utilizing TSMO and ITS; and

WHEREAS, the Department is currently in the process of hiring a consulting firm to prepare a statewide TSMO plan and it has been determined that a regional TSMO plan and ITS architecture update for Northwest Arkansas may be accomplished utilizing the same consulting firm; and

WHEREAS, Arkansas State Highway Commission Minute Order 2020-041 authorized the Director to enter into any necessary agreements with NWARPC for the Project; and

WHEREAS, the NWARPC has passed Resolution 2020-03 agreeing to partner with the Department for the Project; and

WHEREAS, it is understood that the NWARPC and the Department will adhere to the General Requirements for Recipients and Sub-Recipients Concerning Disadvantaged Business Enterprises (DBEs) (Attachment A) and that, as part of these requirements, the Department may set goals for DBE participation in the Project, ranging from 0% to 100%, that are practical and related to the potential availability of DBEs in desired areas of expertise; and

INTELLIGENT TRANSPORTATON SYSTEMS (ITS)

Intelligent Transportation Systems (ITS) is the application of advanced sensor, computer, electronics, and communication technologies and management strategies—in an integrated manner—to improve the safety and efficiency of the surface transportation system.

ITS covers a broad range of wireless and wireline communications-based information, control and electronics technologies. When integrated into the transportation system infrastructure, and in vehicles themselves, these technologies help monitor and manage traffic flow, reduce congestion, provide alternate routes to travelers, enhance productivity, and save lives, time and money. Intelligent Transportation Systems provide the tools for transportation professionals to collect, analyze, and archive data about the performance of the system during the hours of peak use. Having this data enhances traffic operators' ability to respond to incidents, adverse weather or other capacity constricting events.

Examples of Intelligent Transportations Systems include:

Advanced Traveler Information Systems deliver data directly to travelers, empowering them to make better choices about alternate routes or modes of transportation. When archived, this historical data provides transportation planners with accurate travel pattern information, optimizing the transportation planning process.

Advanced Traffic Management Systems employ a variety of relatively inexpensive detectors, cameras, and communication systems to monitor traffic, optimize signal timings on major arterials, and control the flow of traffic.

Incident Management Systems, for their part, provide traffic operators with the tools to allow quick and efficient response to accidents, hazardous spills, and other emergencies. Redundant communications systems link data collection points, transportation operations centers, and travel information portals into an integrated network that can be operated efficiently and "intelligently."

ITS Regional Architecture Development

The FHWA issued a final rule to implement Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21) in January 2001. This final rule requires that ITS projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards.

To meet these requirements and ensure future Federal funding eligibility for ITS, NWARPC in conjunction with the ARDOT initiated the development of a Regional ITS Architecture and Deployment Plan. The Regional ITS Architecture provides a framework for ITS systems, services, integration, and interoperability, and the Regional ITS Deployment Plan identifies specific projects and timeframes for ITS implementation to support the vision developed by stakeholders in the Architecture.

The NWARPC in conjunction with local stakeholders and the consulting firm Kimley Horn developed the Regional ITS Architecture and Deployment Plan in 2006 and 2007. A kick off meeting was held on September 14, 2006 and numerous meetings and workshops followed. The final ITS Regional Architecture and Deployment Plan was presented to the TAC and RPC/Policy Committee on April 26, 2007. A process was initiated to amend the Architecture and Deployment Plan into the 2030 Northwest Arkansas Regional Transportation Plan. The TAC and Policy Committee met on May 24, 2007 and voted in favor of the amendment. The report can be found at http://www.consystec.com/arkansas/nwark/web/_projectdocs.htm.

Some of the benefits of the Regional ITS Architecture are:

- Allows ITS implementation to be efficiently structured.
- Builds a foundation for explicitly incorporating operations and management into decision-making.
- Encourages stakeholder buy-in.
- Assists in estimating funding needs.
- Serves as a tool for education/regional information exchange.

- Assists in identifying gaps in existing services.

A brief summary of Regional Priorities from the ITS Deployment Plan:

- Continue municipal and county traffic signal system coordination and signal equipment upgrades.
- Continue pursuit of DMS deployment on I-49.
- Transit agencies will continue implementation of vehicle tracking and traveler information deployments.
- ARDOT will continue deployment of the I Drive Arkansas system.

CONGESTION MANAGEMENT PROCESS

Congestion management is the use of strategies to optimize operations of a transportation system through management and operation of the existing system. As such, a congestion management process (CMP) is a systematic regional approach that provides current performance measures detailing the system performance and evaluates strategies that meet the local objectives. The NWARPC finalized the current CMP in May 2015. This report can be found at https://www.nwarpc.org/transportation/congestion-management-process/. The NWARPC is updating the CMP beginning in 2021.

The CMP is intended to serve as a systematic process that provides for safe and effective integrated management and operation of the multimodal transportation system. The process includes:

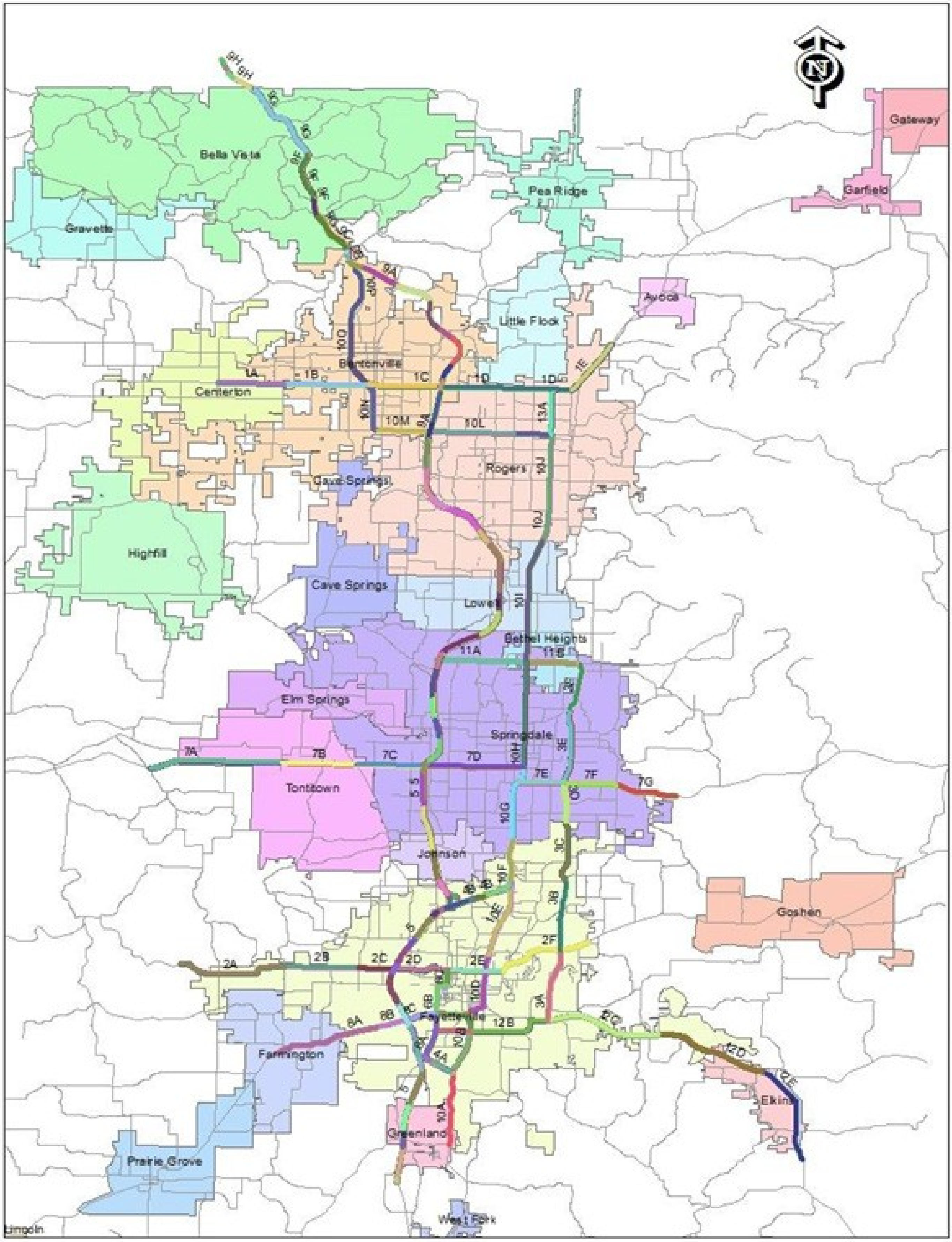
- Development of congestion management objectives.
- Establishment of measures of multimodal transportation system performance.
- Collection of data and system performance monitoring to define the extent and duration of congestion and determine the causes of congestion.
- Identification of congestion management strategies.

The Northwest Arkansas CMP provides a structure for responding to congestion in a consistent, coordinated fashion by responding to congestion through a process that involves developing congestion management objectives, developing performance measures to support these objectives, collecting data, analyzing problems, identifying solutions, and evaluating the effectiveness of implemented strategies.

The goal of the CMP is to ensure optimal performance of the transportation system by identifying congested areas and related transportation deficiencies.

The CMP network includes 224.5 centerline miles of roadway spread over 13 different roadways divided into 234 directional links bound by a traffic signal, stop sign, or major cross street. Of the 242 directional miles studied in the morning peak and afternoon peak periods, it was determined to classify the top 15 percent of the segments as congested including both the results of the AM and PM periods. The AM period was defined from 7:00-9:00 AM, while the PM period was defined from 4:30-6:30 PM. Map 8.2 shows the 2015 CMP Network.

Hwy. 412 (Sunset Ave)



Map 8.2 - 2015 CMP Network

CONGESTION PERFORMANCE MEASURES

The purpose of the CMP Study was to identify and quantify problem areas in the region using 2013 private sector travel speed data and ARDOT volume data. Private sector 2013 travel speed data was procured for the region which covered the National Highway System (NHS) and arterial network in the urbanized area. Through the use of private sector travel speed data, various performance measures were calculated.

NWARPC has introduced the use of congestion index (CI) as one element of performance in the CMP. This performance measure allows easy comparison of the efficiency of roadways as a ratio of average travel speed to the posted speed limit. The second measure is volume delay per mile. This performance measure calculates the delay or amount of time drivers wait as compared to traveling at the posted speed. Also, by multiplying it by the link volume, the overall impact of the delay can be measured. CI is purely a measure of delay time, but does not relate the number of cars in the delay. In many cases the minor or secondary roads are high on the CI ranking but rank lower on the volume delay because fewer vehicles and people are affected on these secondary roads. The CMP segments vary in length across the board between those on arterials and freeways. In order to standardize the results and allow direct comparison across the network, the volume-delay results were divided by the length. This measure provides a result with the units of vehicle hours of delay per mile, thus allowing a more direct comparison between segments. As a result, the preferred performance measure was determined and used to identify the operating results of each link of the CMP network.

Congestion Index (CI)	**Actual Average Speed / Weighted Average Posted Speed Limit**
Actual Average Speed	**Average speed of all INRIX data on the segment**
Weighted Average Posted Speed Limit	**Average of all posted speed limits on the segment weighted by length**
Volume Delay (VD/mile)	**Delay X Segment Volume / Segment Length**

Based on the local conditions in the region, attention was focused on the peak periods. The duration of congestion and other performance measures were not as much of a concern with the short peaking of congestion within the region. This also is applicable in most areas of the region to performance measures based on volume. There are a few areas within the region where capacity is an issue, but most delay occurs at the node level and is not a link problem. Because volume is measured mid-block and does not consider the operations of the nodes (intersections), attention is being focused at the location where the MPO can get the most benefit.

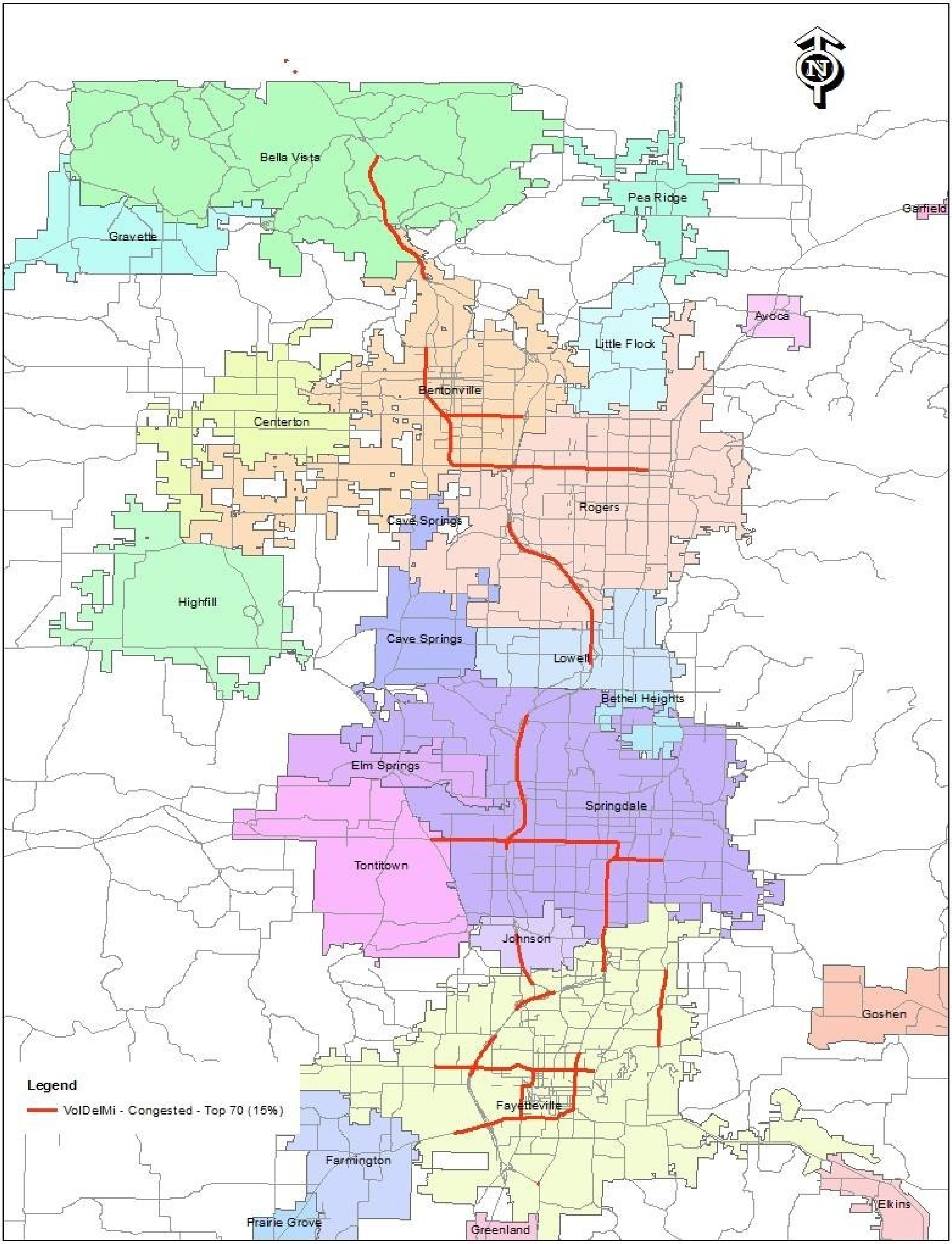
The primary performance measure is volume delay per mile. In order to narrow the focus on those roadway segments that need attention and commonly have recurring delay, the results were tabulated and the highest 15 percent of the network was categorized as congested. Over time, with future updates, the region will be able to revisit these thresholds and adjust as desired. FHWA encourages flexibility with the process and customization of the methodology and performance measures to respond to the local and regional objectives.

The region can also consider adding other performance measures in future updates that are multi-modal based that reflect the accessibility of transit, bike, and pedestrian facilities. This can be as direct on the regional level as the percent of jobs or households within ¼ mile of transit. This will serve as an indicator of the accessibility to transit and should have some correlation to the ridership.

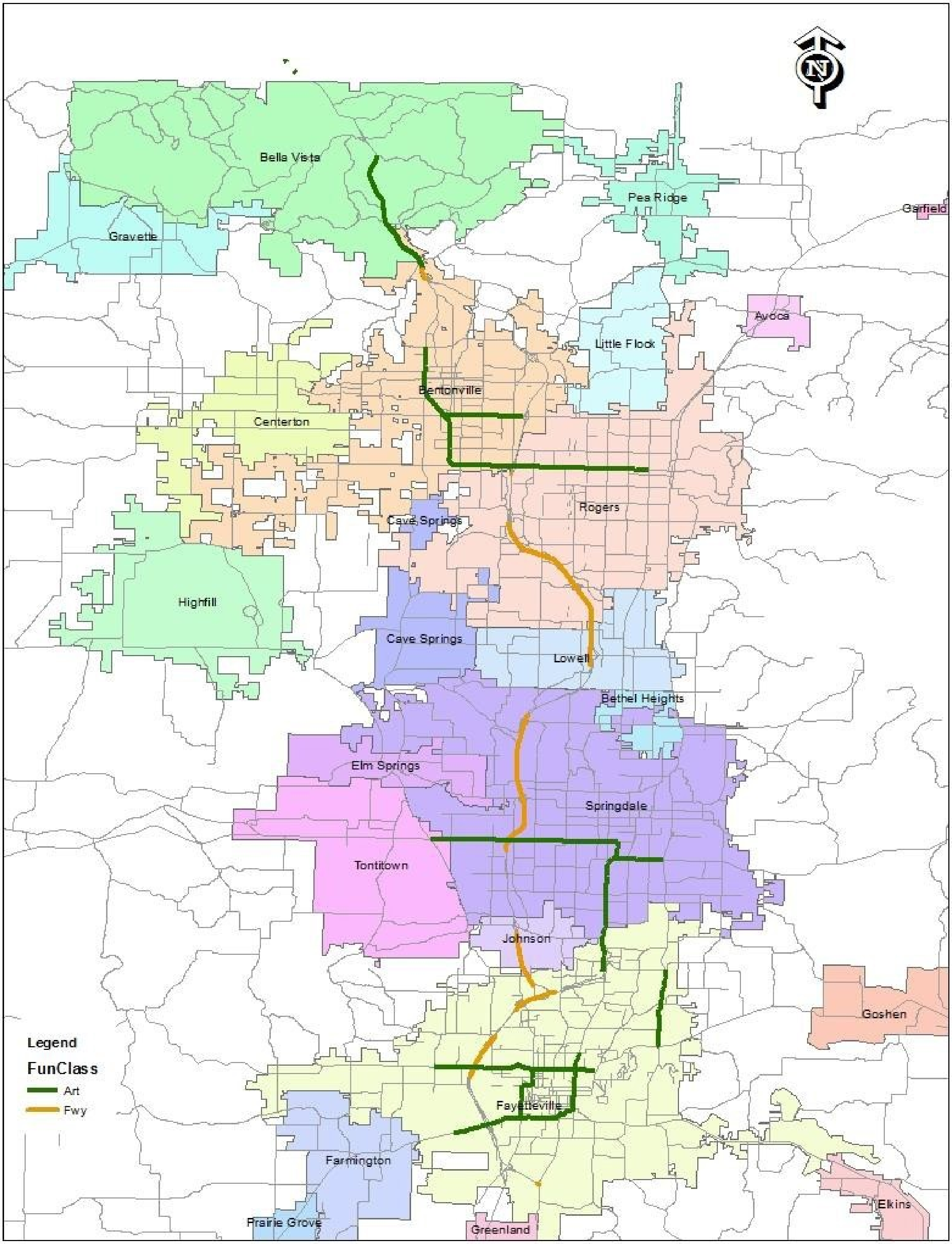
Table 8.1 and Maps 8.3 and 8.4 show the Top 20 congested segments in CMP Study based on the volume-delay per mile performance measure for both the AM and PM peak period. This results in some segments being classified as "congested" for both periods.

Top 20 Rank (Art/Fwy)	SegmentId	Route	Segment Name	Time Period	Func Class	City	Length (mi)	Weighted Avg Speed Limit	Congestion Index	Volume Delay per Mile
1	9E	Hwy 71 - SB	Mercy Way to Riorden Rd	AM	Art	Bella Vista	1.61	45.0	0.51	194.2
2	9C	Hwy 71 - SB	Peach Orchard Rd to Mercy Way	AM	Art	Bella Vista	1.34	45.0	0.49	168.1
3	2E	North St - EB	Oakland Ave to Hwy 45	PM	Art	Fayetteville	1.37	26.4	0.38	155.0
4	5389030	I-49 - SB	South of Fullbright	PM	Fwy	Fayetteville	0.27	60.0	0.68	123.3
5	2E	North St - EB	Oakland Ave to Hwy 45	AM	Art	Fayetteville	1.37	26.4	0.45	106.4
6	5369443	I-49 SB	Short segment at on-ramp from Walnut	PM	Fwy	Rogers	0.21	70.0	0.44	103.4
7	10M	Hwy 71B - EB	I-49 to Rainbow Rd	PM	Art	Bentonville	1.34	45.0	0.46	79.2
8	5369443	I-49 SB	Short segment at on-ramp from Walnut	AM	Fwy	Rogers	0.21	70.0	0.48	73.1
9	2C	Hwy 16 - EB	Rupple Rd to Futtrall	PM	Art	Fayetteville	1.07	43.9	0.48	70.1
10	2C	Hwy 16 - WB	Rupple Rd to Futtrall	PM	Art	Fayetteville	1.07	43.9	0.48	69.7
11	5389031	I-49 - SB	West of Hwy 112	PM	Fwy	Fayetteville	0.25	60.0	0.65	67.2
12	5369409	I-49 - NB	South of Walton on-ramp	PM	Fwy	Bentonville	0.34	54.4	0.47	66.6
13	10M	Hwy 71B - Walton Blvd - WB	I-49 to Rainbow Rd	PM	Art	Bentonville	1.34	45.0	0.50	65.7
14	9C	Hwy 71 - NB	Peach Orchard Rd to Mercy Way	PM	Art	Bella Vista	1.34	45.0	0.71	60.9
15	5402368	Hwy 71 - SB	North CMP limits	PM	Art	Missouri	0.06	45.0	0.40	58.5
16	10F	Hwy 71B - NB	Shiloh to Tyson Pkwy	PM	Art	Springdale	1.70	43.3	0.55	55.4
17	5389276	I-49 - NB	North of Hwy 412	AM	Fwy	Springdale	0.54	70.0	0.67	53.6
18	5402369	Hwy 71 - NB	North CMP limits	PM	Art	Missouri	0.06	45.0	0.42	52.7
19	5389139	Fullbright - WB	Within I-49 interchange	PM	Fwy	Fayetteville	0.61	60.0	0.71	51.6
20	5389081	I-49 - NB	South of Fullbright interchange	AM	Fwy	Fayetteville	0.43	63.5	0.73	51.0

Table 8.1 - Top 20 Congested Segments in the CMP Study



Map 8.3 - Congested Road Segments



Map 8.4 - Congested Road Segments by Functional Class

CONGESTION MANAGEMENT STRATEGIES

Access Management

Access management is accomplished in a variety of ways such as managing the design of access points, the location of access points, the number of access points allowed within a given distance (access density), and the roadway median treatment. Generally, the number of access points is minimized and regularly spaced from each other so that conflict points are separated.

2013 2015

Highway 265 Access Management Plan – 3-lane Undivided to 4-lane Divided Median Boulevard, Bike Lanes, and Sidewalks

Signal Timing

Signal timing improvements are a relatively inexpensive way to make significant improvements on a transportation network. Improved signal timing can decrease delay by appropriately allocating green time among competing phases. This allows more traffic to pass through the signal with less delay. By adjusting cycle lengths and offsets, drivers can travel longer distances along a corridor before having to stop for a red light. This decreases travel time and improves air quality. Both signal timing optimization and traffic signal progression are low-cost improvements to make the best use of existing capacity and optimize allocation of funding. The cost for a signal timing improvement project varies depending on the number of traffic signals, the controller capabilities, the location of the traffic signals and adjacent signals, the number of timing plans required, and implementation and fine-tuning needs. Adaptive signal control as has been implemented along Hwy. 71B in Springdale and Rogers and Hwy. 62 in Rogers and will be more expensive per intersection than just occasional signal optimization, but depending on the application, may be cost effective in the long run.

Signal timing is an area that deserves attention within the region to allow maximum efficiency of the existing system before costly widening to add capacity. The results will be very evident as has been demonstrated previously with localized projects. A regional perspective would produce consistent travel time runs even when crossing from one city/agency to another.

As transportation funding continues to be limited, operations are being highlighted by many regions across the country. It has been clearly proven locally and nationally that operational improvements provide the highest benefit/ cost ratio and on a regional scale as compared to local capacity projects that benefit a smaller portion of the area.

Data collection, development of a model for each desired timing plan, signal timing optimization, and implementation can be accomplished along a corridor for around $3,000 per intersection (not including any necessary hardware in the signal cabinet).

The methods will vary as to how to accomplish the desired results depending on the signal hardware currently in place and the expansion capabilities. It can be as simple as installing a GPS clock at each intersection ($500) to synchronizing the controller clocks, to more advanced systems where each intersection needs vehicle detection ($15,000) and wireless communications ($2,500) between signals. Either way, the benefit/cost ratio of this type of work is unmatched in today's funding environment.

Intersection and Interchange Geometrics and Control

Adding signals or roundabouts, when warranted, may be an improvement at all-way stop intersections or intersections with heavy major-street and cross-street traffic. This reduces delay for previously stop-controlled movements but may increase delay for movements that were not controlled. As traffic volumes increase, traffic signals or other types of intersection design such as roundabouts or continuous flow intersections should be considered to efficiently move traffic. Local intersection improvements also can result in big reductions in delays through bottleneck mitigation. Local improvements include geometric changes related to increased queue storage to channelized right turns and overlapping signal phases.

2010 **2015**

Fulbright Expressway - Northhills Boulevard - Futrall Drive Roundabout

2010 **2015**

Fayetteville Flyover/Fulbright Expressway

Incident Management

Non-reoccurring congestion based on traffic incidents (crashes) can account for up to 25 percent as the source of congestion. Incident management plays a large roll in reducing delays and secondary incidents. By identifying incidents early and having quick responses from tow trucks available in close proximity that may be stationed or roving, clearing of incidents helps traffic return to normal operations as quick as possible.

Safety Projects – Roadway Departures, Grade Separated Bicycle and Pedestrian Crossings

Safety projects reduce crash rates and the severity of crashes. The region should continue to deploy rumble strips as needed, cable median barriers, enhanced signing at curves and high friction pavements to reduce crash rates on the CMP network. Additionally, two Razorback Regional Greenway trail crossings have been grade-separated (MLK/Hwy. 180, and S. Walton Blvd./Hwy. 71B) on the CMP network which improves the safety and reliability of both systems.

2010 **2015**

I-49 Cable Median Barrier Project, Springdale, AR

ARDOT is installing approximately 600 miles of cable barrier installations statewide. Within the MPA, ARDOT has installed approximately 46 miles of cable barrier with 24 miles of cable barriers along I-49 between Fayetteville and Bentonville (Table 8.2). The safety project was completed in 2012 between Fayetteville and Rogers. ARDOT reported that from 2007 to 2011, before the cable barriers were installed, there were 17 serious median crossover crashes that resulted in 10 fatalities along I-49, an average of two fatalities per year. In areas where I-49 was widened, a concrete barrier replaced the cable median barrier.

Jobs Completed/Under construction/Programmed			
County	**Location**	**Length**	**Total Length**
Benton	Hwy 71, Section 190, LM 0 - 5.5	5.5	25.97
	Hwy 412, Section 010, LM 4.83 - 13.64	8.81	
	I-49, Section 050, LM 74.19 - 85.85	11.66	
Washington	Hwy 71, Section 160, LM 22.39 - 23.32	0.93	18.54
	Hwy 412, Section 020, LM 0 - 2.49	2.49	
	I-49, Section 040, LM 40.2 - 41.13	0.93	
	I-49, Section 040, LM 60 - 60.56	0.56	
	I-49, Section 040, LM 60.56 - 74.19	13.63	

Table 8.2 - Cable Barrier Jobs

2010 2015

MLK Blvd - Razorback Regional Greenway Pedestrian and Bicycle Underpass

Capacity

Roadway widening is necessary where traffic signal timing and access management are unable to provide enough capacity for heavy traffic volumes. Some segments may improve in the short term with optimized signal timing, but may ultimately warrant additional capacity through widening. Widening could include adding a through lane for a long section of road, or providing turn lanes at intersections. Capacity improvements on I-49 (widening) and designing urban interchanges to accommodate anticipated traffic continues to be a priority for the region.

2010 **2015**

Don Tyson Parkway Interchange/I-49

National Performance Management Research Data Set (NPMRDS)

Transportation agencies are increasingly using probe vehicle data for transportation system performance management and as a resource for meeting the federal requirements of monitoring and reporting congestion and freight performance enacted in the Moving Ahead for Progress in the 21st Century Act (MAP-21). Federal regulations require setting objectives and targets to guide transportation funding allocation based on safety and operational performance measures.

To assist agencies with meeting the MAP-21 regulations, the Federal Highway Administration (FHWA) provides free access to the National Performance Management Research Data Set (NPRMDS), a national database of probe-vehicle-based speed and travel time data. The NPMRDS offers a new opportunity to monitor and report work zone performance measures. Using the NPMRDS, agencies can better benchmark the baseline mobility conditions prior to work zone activity, quantify and analyze work zone mobility impacts both during construction and post-construction, and implement mobility objectives and targets to proactively manage work zone mobility impacts. More information about this program can be found at https://ops.fhwa.dot.gov/publications/fhwahop20028/index.htm

The National Performance Management Research Data Set in a Nutshell

Data Providers: INRIX, TomTom, HERE

Funded By: FHWA

Purpose: Support MAP-21 regulation and ongoing transportation system mobility performance measurement

Users: Federal, State, and regional agencies

Data Source: Probe vehicles

Metrics: Speed, travel time, and static AADT (2017)

Data Latency: One-month old

Lowest Temporal Resolution: 5 minutes

Spatial Resolution: TMC level (about ½ mile to 1 mile in urban/suburban areas and 5-10 miles in rural areas)

Geographical Coverage: NHS

Modal Coverage: Truck and passenger car Data Format: CSV and ArcGIS shapefiles (road segment details)

Licensing Agreement: Required

The NPMRDS contains field-observed travel time and speed data collected anonymously from a fleet of probe vehicles (cars and trucks) equipped with mobile devices. Using time and location information from probe vehicles, the NPMRDS generates speed and travel time data aggregated in 5-minute, 15-minute, or 1-hour increments. The data are available across the National Highway System (NHS), with a spatial resolution defined by Traffic Message Channel (TMC) location codes. A TMC represents a unique, directional roadway segment that is about half a mile to a mile long in urban and suburban areas and could be as long as five to ten miles long in rural areas. The NPMRDS covers more than 400,000 TMCs and includes several billions of speed and travel time observations across the NHS for both freeways and arterials. The NPMRDS has been available since 2013, with freeway data dating back as far as 2008.

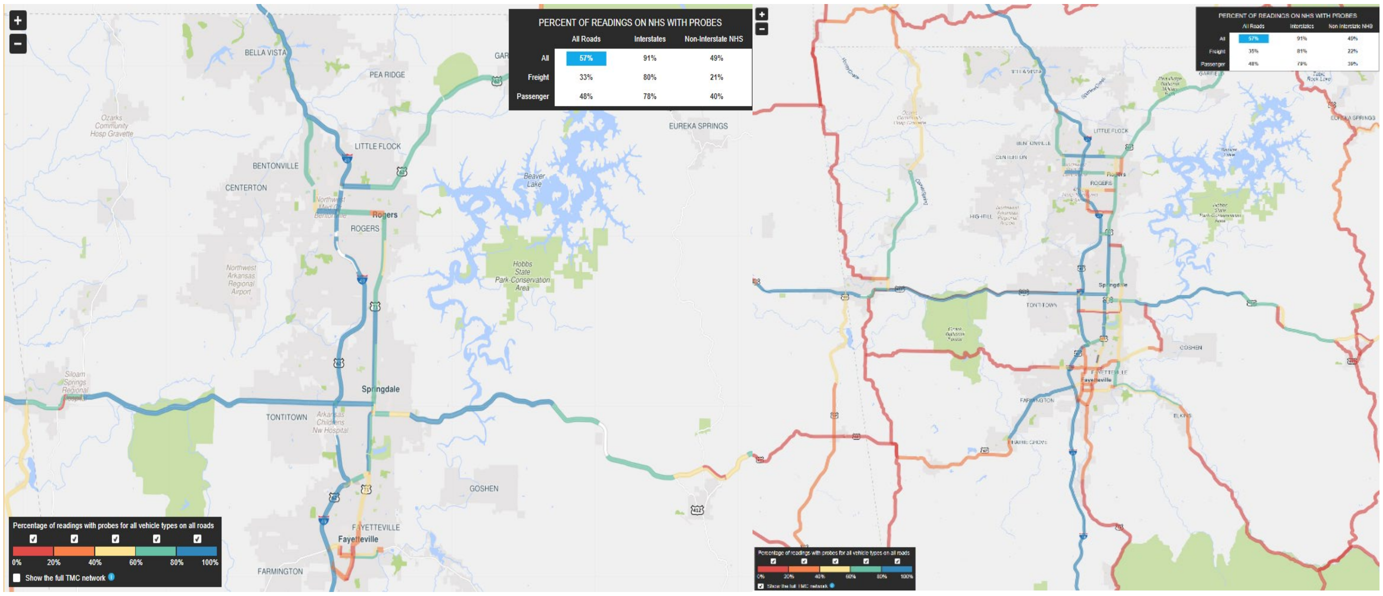
NPMRDS data are populated monthly for the previous month, thus they are not available in real time. Agencies can use the data for non-real-time analysis, performance monitoring, and reporting. State and other transportation agencies can access and use the NPMRDS for free through an account with the Regional Integrated Transportation Information System (RITIS) after agreeing to the necessary license agreement (https://npmrds.ritis.org/). The NPMRDS data can be used for a variety of applications, including planning, design, traffic operations and management, freight analysis, safety analysis, and congestion analysis.

Limitations of the National Performance Management Research Data Set

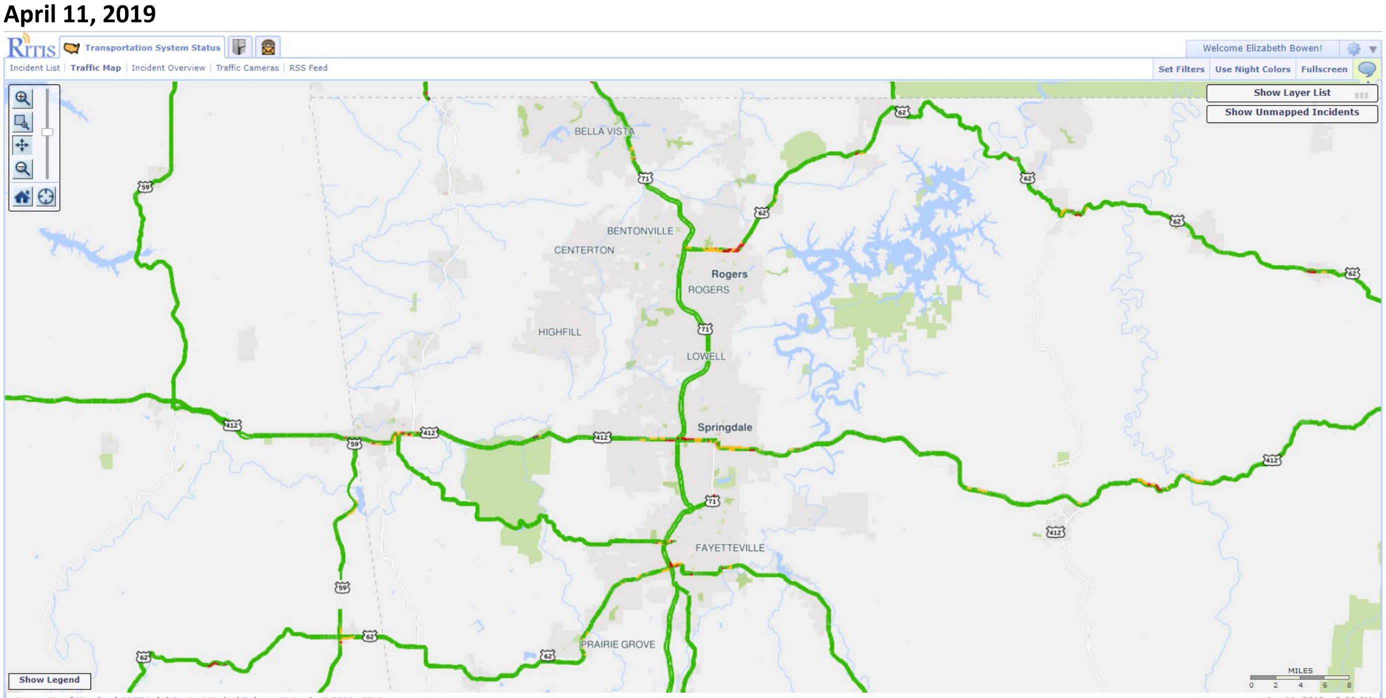
Although the NPMRDS creates a new opportunity for offline monitoring and performance reporting of work zones and other transportation aspects, there are some limitations that State and local agencies must consider when performing an analysis using the NPMRDS.

- **The NPMRDS does not provide real-time data.** NPMRDS data are a month old and therefore cannot be used for real-time traffic monitoring. However, the NPMRDS is very well suited for offline work zone performance assessment and post-hoc evaluations. For real-time management needs, agencies can purchase real-time probe-vehicle data from appropriate providers (e.g., RITIS, INRIX).
- **Data quality and availability varies.** The NPMRDS may have a significant number of outliers and missing values depending on road type, location, day of week, time of day, segment length, and traffic volume. For road segments not traversed by a probe vehicle during a certain time period, the corresponding entries in the NPMRDS are left blank and not imputed with historical data. Therefore, data may not be complete for all road segments (especially rural, lower-volume areas) or for all hours of the day (especially nighttime conditions). This could limit agencies from being able to use for the NPRMDS for monitoring and reporting work zone performance on low-traffic and rural roads.
- **TMC segment lengths in some areas (e.g., rural roads) may be too long to provide an accurate picture of delay and travel time.** TMC segment lengths could be as long as 5 to 10 miles, especially in rural areas. This could misrepresent the actual traffic speed and travel time observed around work zones, especially if queues are only a couple of miles long (a small part of the larger segment). Agencies can overcome this limitation by purchasing data at a higher granularity from INRIX or other providers.
- **Coverage of the NPMRDS is only on the NHS.** Because the NPMRDS covers only the NHS, it is not useful for examining the mobility impacts of work zones located on roads outside of the NHS.
- **The basic NPMRDS (free package provided by FHWA) does not come with pre-built analytical tools.** Agencies may download NPMRDS data into an appropriate tool/platform (e.g., Microsoft® Excel, database tool, statistical analysis tool, etc.) to run analyses, reports, and visualizations. Alternatively, agencies may purchase access to the web-based NPMRDS Deep-dive Analytical Toolset through the American Association of State Highway Transportation Officials' (AASHTO's) TMC Pooled Fund Study, or directly from the University of Maryland CATT Laboratory. (An option to expand the NPMRDS dataset well beyond the NHS is also available through AASHTO.) The NPMRDS Deep-dive tools provide many features including Congestion Scans, Performance Summaries/Charts, Road User Cost Analyses, Animated Trend Maps, and Custom MAP-21 Dashboards. Specific information about these is found here: https://www.tpm-portal.com/wp-content/uploads/cpbm/20171214-slides.pdf. General information about these and other tool options is found at https://www.ritis.org/tools.

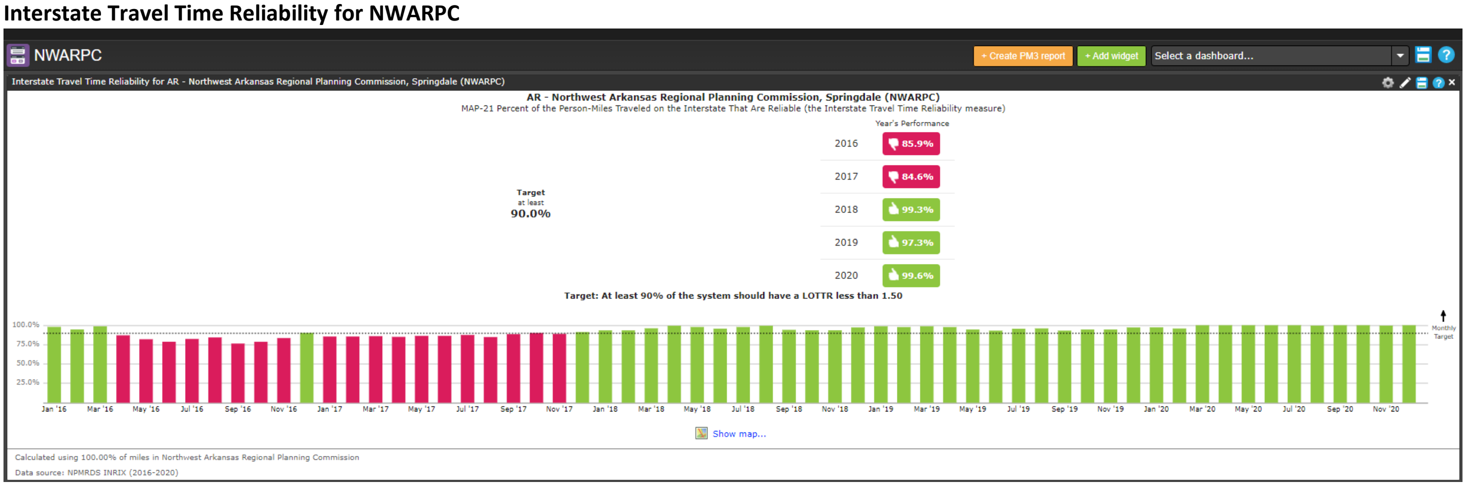
NWA NPMRDS NETWORK



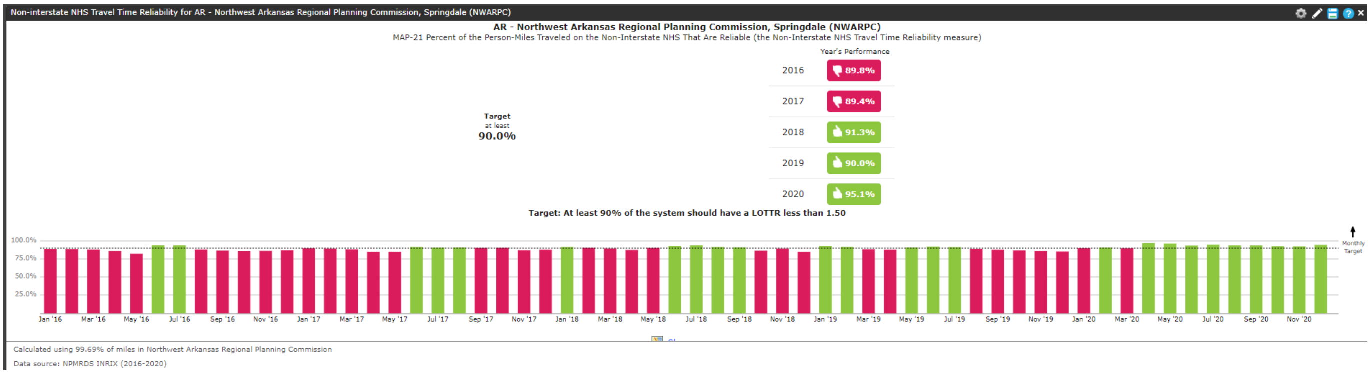
April 11, 2019



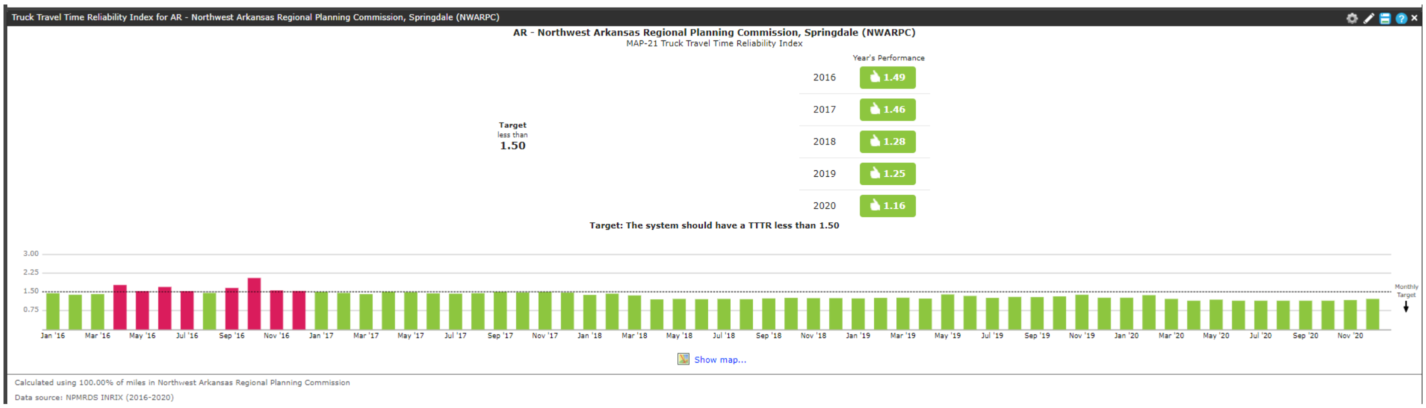
Interstate Travel Time Reliability for NWARPC



Non-Interstate Travel Time Reliability for NWARPC



Truck Travel Time Reliability for NWARPC



TRANSPORTATION DEMAND MANAGEMENT (TDM)

TDM (also known as Mobility Management) is a general term for various strategies that increase transportation system efficiency. TDM treats mobility as a means to an end, rather than an end in itself, and so helps individuals and communities meet their transport needs in the most efficient way, which often reduces total vehicle traffic. TDM prioritizes travel based on the value and costs of each trip, giving higher value trips and lower cost modes priority over lower value, higher cost travel, when doing so increases overall system efficiency. It emphasizes the movement of people and goods, rather than motor vehicles, and so gives priority to public transit, ridesharing and non-motorized travel, particularly under congested urban conditions.

There are many different TDM strategies with a variety of transportation impacts. Some improve the transportation options available to consumers. Some cause changes in trip scheduling, route, destination or mode. Others reduce the need for physical travel through more efficient land use, or transportation substitutes such as telecommuting. TDM is an increasingly common response to transport problems. Although most individual TDM strategies only affect a small portion of total travel, the cumulative impacts of a comprehensive TDM program can be significant.

TRANSIT ORIENTED DEVELOPMENT (TOD)

Transit oriented development (TOD) can be defined as mixed use residential or commercial development within walking distance of a transit station designed to maximize access to transit and incorporating features designed to encourage transit ridership. A TOD often resembles other activity centers with a greater mix of uses and higher densities than the surrounding market area. TODs typically have the following features:

Mix of Uses – Land uses can be mixed either vertically or horizontally. TOD is most often primarily residential at suburban locations but can have employment and other commercial and retail uses at activity center and downtown locations.

Compact Development – TODs are built at higher densities than the surrounding market area, creating a focal point around a transit station. The density and amount of development are market driven; higher land values support higher development densities and more urban locations support greater amounts of development.

Pedestrian Oriented – The development pattern at TODs is designed to facilitate pedestrian access to and from the station with ample sidewalks, interconnected blocks and streets, and buildings oriented toward the street, and parking located in secondary locations.

Urban designers and planners who advocate more infill and compact development suggest TOD as one alternative. TOD is compact, walkable development occurring within one-half mile of a transit stop. In general, transit-oriented developments include a mix of uses, such as housing, shopping, employment, and recreational facilities within a design that puts a high priority on accommodating transit, pedestrians and bicycles.

Besides providing direct access to transit, transit-oriented developments can offer a variety of destinations close to one another, making it possible to move around without exclusive reliance on a car. If possible, transit-oriented developments should incorporate an attractive public area —for example, streets with trees, furniture, and plazas—to encourage pedestrian activity.

Opportunities for TOD in Northwest Arkansas may include downtown locations in large and small cities. Also, locations near major freeways, such as I-49, might be adaptable to TODs should bus rap- id transit become available. Lower transportation costs, according to TOD advocates, can offset the higher housing costs of living in an urban neighborhood. Urban neighborhoods tend to have high housing costs but lower transportation costs. Current mortgage assessments only consider housing costs and treats automobile ownership as a financial asset rather than a liability, encouraging homebuyers to choose automobile-dependent locations. Higher density, location- efficient development creates a more neutral housing market.

Even though there may be many benefits with TOD, there are also many obstacles to their development. Neighborhood groups usually oppose high-density developments that might attract more traffic. Local development codes around transit stations usually favors low-density, auto-oriented uses. Mixed-use, higher density projects with reduced amounts of parking (such as in TOD) can significantly increase risks for developers and financers.

TOD can be more costly, and can be subject to more regulations and more complex local approval processes, as compared to conventional automobile-oriented development. Lenders typically have concerns about financing mixed-use projects or those with lower parking ratios as with TOD.

Given the listed potential advantages of TOD and the possible funding sources the region should consider how such developments might be encouraged in Northwest Arkansas.

Becoming Transit Ready

Planning for transit and TOD is compatible with multiple revitalization and redevelopment goals such as attracting mixed use development, increasing development density and diversity, creating walkable neighborhoods and business districts, and redeveloping or re-purposing obsolete industrial property adjacent to rail corridors. Many communities in the Kansas City, Denver, and Dallas regions are planning or have planned for transit service and TOD well in advance of an operating transit service. Many of the principles of TOD—higher densities, walkability, and a mix of uses—are the same principles that apply to any urban, suburban, or downtown revitalization planning effort. Since land use change can take several years, it is important to begin planning and implementing higher density development and revitalization plans now to position the region for future transit service.

Source: Fayetteville Downtown Master Plan

PERFORMANCE MANAGEMENT AND SYSTEM MEASURES

MAP-21/FAST Act established a performance and outcome-based program. NWARPC, ARDOT and MoDOT are required to develop plans and programs that help achieve the national goals for (1) Safety, (2) Infrastructure Condition, (3) Congestion Reduction, (4) System Reliability, (5) Freight Movement and Economic Vitality, (6) Environmental Sustainability, and (7) Reduced Project Delivery Delays.

Over the past several years, final rules on performance measures and targets have been published by FHWA and FTA. MoDOT, ARDOT, and NWARPC continues to work together to identify measures and develop systems/methodologies to implement performance-based transportation planning and programming.

NWARPC 2045 MTP Goals		2045 MTP System Performance Measures
Preserve and Maintain Infrastructure	Maintain the existing and planned transportation system through ongoing maintenance, rehabilitation, reconstruction, and/or preservation.	Percentage of interstate pavements in good condition Percentage of interstate pavements in poor condition Percentage of non-interstate NHS pavements in good condition Percentage of non-interstate NHS pavements in poor condition Percent of NHS bridges by deck area classified as Good condition Percent of NHS bridges by deck area classified as Poor condition Pavement Condition on NHS Transit (PTASP) mean distance between major mechanical failure Transit (TAM) Plan transit bus/fleet age/condition
Improve Safety	Increase transportation safety for all modes of travel	Number of fatalities Fatality rate per 100 million VMT Number of serious injuries Serious injury rate per 100 million VMT Number of non-motorized fatalities and serious injuries Transit (PTASP) Number of fatalities and injuries and rate per revenue miles
Reduce Congestion Improve Reliability	Maximize the capacity and reliability of existing facilities on regionally significant routes and minimize the need for new roadways.	Interstate Travel Time Reliability Measure: Percent of Reliable Person-Miles Traveled on the Interstate Non-Interstate Travel Time Reliability Measure: Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS Freight Reliability Measure: Truck Travel Time Reliability Index Volume Delay Per Mile on CMP Congestion Index on CMP Level of Travel Time Reliability (LOTTR) on NHS Truck Travel Time Reliability (TTTR) on NHS
Improve Regional Mobility	Increase transportation mobility and accessibility for both persons and freight, thus promoting economic vitality in the region.	Miles of Complete Streets Miles of roadways with Access Management % population served by trails within 1/4 mile % population served by public transit within 1/4 mile Unlinked Trips per revenue mile (Transit, NTD) Unlinked Trips per Revenue hour (Transit, NTD)
Protect the Environment	To enhance the performance of the transportation system while protecting and enhancing the natural environment.	Number of Jurisdictions with drainage criteria manuals Number of jurisdictions with Karst BMP's Cave Springs Recharge Area

SAFETY

Safety of the transportation system is one of the national goals and a performance measurement area under MAP-21/FAST Act. Safety currently is measured nationally, by individual state, and by county based on data reported to the States and U.S. DOT. Safety performance is generally measured by calculating the fatality and serious injury rates of the system based on vehicle miles of travel (VMT) and 100,000 population.

Travel is measured as vehicle miles of travel (VMT) and is calculated and published each year by ARDOT and MoDOT in the Road and Street Mileage Report. This annual calculation is based on the Annual Average Daily Traffic (AATD) counts and mileage of the transportation system (AADT x Length of the roadway system = Vehicle Miles of Travel).

The rate of fatalities is generally expressed as rate per 100,000 population and as 100 million annual vehicle miles of travel (100 million VMT). These rates are generally compared to the U.S., State, and other counties.

NWARPC has provided the fatality and serious injury rates expressed in per 100,000 population and 100 million VMT. The Arkansas portion of the MPA boundary (Benton and Washington County) is calculated as one rate and McDonald County is calculated separately utilizing the Fatality Analysis Reporting System (FARS) and the Arkansas State Police Database.

From 2015–2019, Benton and Washington County, Arkansas averaged 46 fatalities each year. The total number of fatalities has ranged from 64 in 2016 to 36 in 2015.

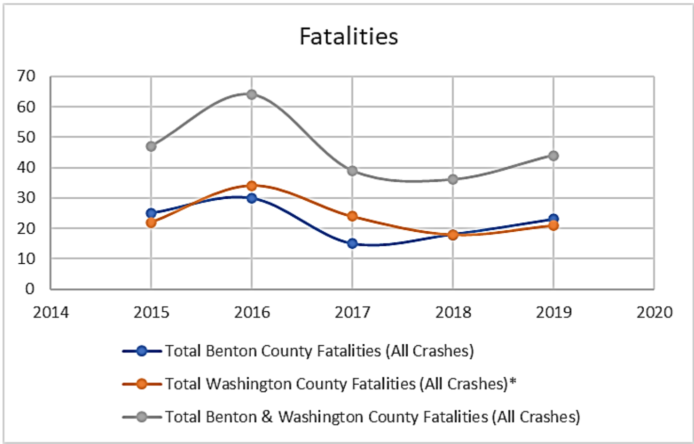
Fatality Type	Washington County Fatalities					Washington County Fatalities Per 100,000 Population				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Total Fatalities (All Crashes)*	22	34	24	18	21	9.80	14.88	10.31	7.61	8.78
(1) Alcohol-Impaired Driving (BAC=.08+) Fatalities	5	9	6	5	3	2.23	3.94	2.58	2.11	1.25
(2) Single Vehicle Crash Fatalities	13	22	15	9	13	5.79	9.63	6.45	3.80	5.44
(3) Large Truck Involved Crash Fatalities	1	3	1	0	3	0.45	1.31	0.43	0.00	1.25
(4) Speeding Involved Crash Fatalities	4	10	6	4	4	1.78	4.38	2.58	1.69	1.67
(5) Rollover Involved Crash Fatalities	7	3	8	3	2	3.12	1.31	3.44	1.27	0.84
(6) Roadway Departure Involved Crash Fatalities	12	25	18	9	10	5.35	10.94	7.73	3.80	4.18
(7) Intersection (or Intersection Related) Crash Fatalities	7	7	4	3	3	3.12	3.06	1.72	1.27	1.25
Passenger Car Occupant Fatalities	4	14	6	5	4	1.78	6.13	2.58	2.11	1.67
Light Truck Occupant Fatalities	10	8	12	2	5	4.46	3.50	5.16	0.85	2.09
Motorcyclist Fatalities	4	7	4	5	5	1.78	3.06	1.72	2.11	2.09
Pedestrian Fatalities	3	4	1	5	7	1.34	1.75	0.43	2.11	2.93
Bicyclist (or Other Cyclist) Fatalities	0	0	1	0	0	0.00	0.00	0.43	0.00	0.00

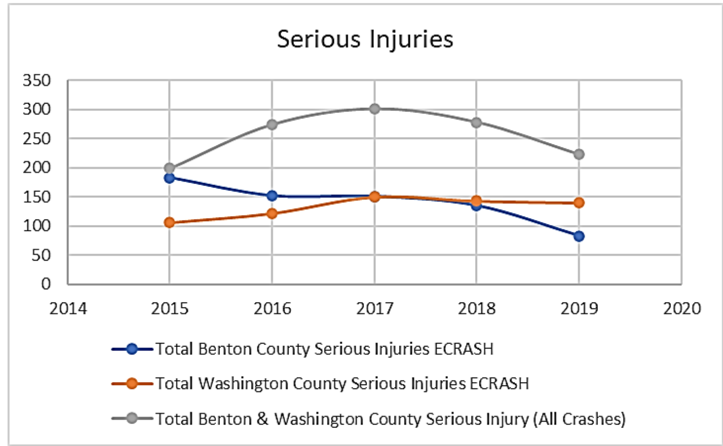
Fatality Type	Benton County Fatalities					Benton County Fatalities Per 100,000 Population				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Total Fatalities (All Crashes)*	25	30	15	18	23	9.94	11.57	5.63	6.61	8.24
(1) Alcohol-Impaired Driving (BAC=.08+) Fatalities	12	4	5	7	6	4.77	1.54	1.88	2.57	2.15
(2) Single Vehicle Crash Fatalities	12	12	4	12	15	4.77	4.63	1.50	4.41	5.37
(3) Large Truck Involved Crash Fatalities	3	3	4	0	0	1.19	1.16	1.50	0.00	0.00
(4) Speeding Involved Crash Fatalities	4	3	3	6	7	1.59	1.16	1.13	2.20	2.51
(5) Rollover Involved Crash Fatalities	5	4	6	5	4	1.99	1.54	2.25	1.84	1.43
(6) Roadway Departure Involved Crash Fatalities	11	16	8	12	15	4.37	6.17	3.00	4.41	5.37
(7) Intersection (or Intersection Related) Crash Fatalities	8	8	5	4	5	3.18	3.09	1.88	1.47	1.79
Passenger Car Occupant Fatalities	11	11	2	3	4	4.37	4.24	0.75	1.10	1.43
Light Truck Occupant Fatalities	6	7	4	10	7	2.38	2.70	1.50	3.67	2.51
Motorcyclist Fatalities	3	9	4	3	8	1.19	3.47	1.50	1.10	2.87
Pedestrian Fatalities	2	2	4	2	2	0.79	0.77	1.50	0.73	0.72
Bicyclist (or Other Cyclist) Fatalities	1	1	0	0	1	0.40	0.39	0.00	0.00	0.36

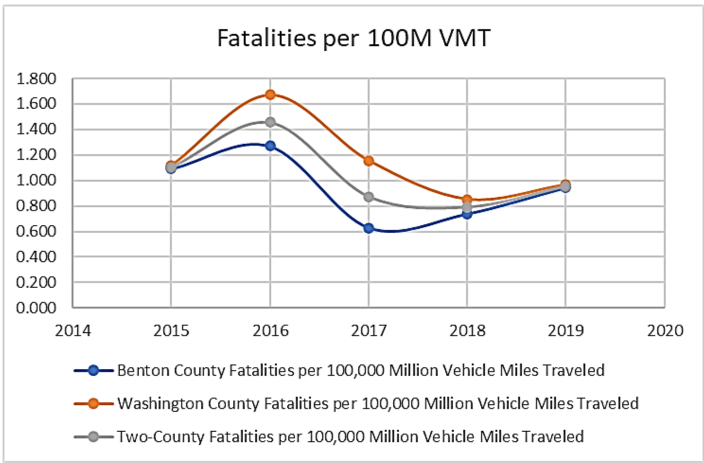
Fatality Type	McDonald County Fatalities					McDonald County Fatalities Per 100,000 Population				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Total Fatalities (All Crashes)*	9	8	9	8	10	39.68	35.23	39.61	34.84	43.79
(1) Alcohol-Impaired Driving (BAC=.08+) Fatalities	3	1	3	1	1	13.23	4.40	13.20	4.35	4.38
(2) Single Vehicle Crash Fatalities	2	5	6	5	3	8.82	22.02	26.41	21.77	13.14
(3) Large Truck Involved Crash Fatalities	1	1	0	1	2	4.41	4.40	0.00	4.35	8.76
(4) Speeding Involved Crash Fatalities	2	4	3	4	2	8.82	17.62	13.20	17.42	8.76
(5) Rollover Involved Crash Fatalities	1	4	3	4	3	4.41	17.62	13.20	17.42	13.14
(6) Roadway Departure Involved Crash Fatalities	5	4	5	6	3	22.04	17.62	22.01	26.13	13.14
(7) Intersection (or Intersection Related) Crash Fatalities	4	1	1	1	2	17.63	4.40	4.40	4.35	8.76
Passenger Car Occupant Fatalities	7	2	2	2	6	30.86	8.81	8.80	8.71	26.27
Light Truck Occupant Fatalities	2	4	4	4	3	8.82	17.62	17.60	17.42	13.14
Motorcyclist Fatalities	0	1	2	2	0	0.00	4.40	8.80	8.71	0.00
Pedestrian Fatalities	0	0	1	0	1	0.00	0.00	4.40	0.00	4.38
Bicyclist (or Other Cyclist) Fatalities	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00

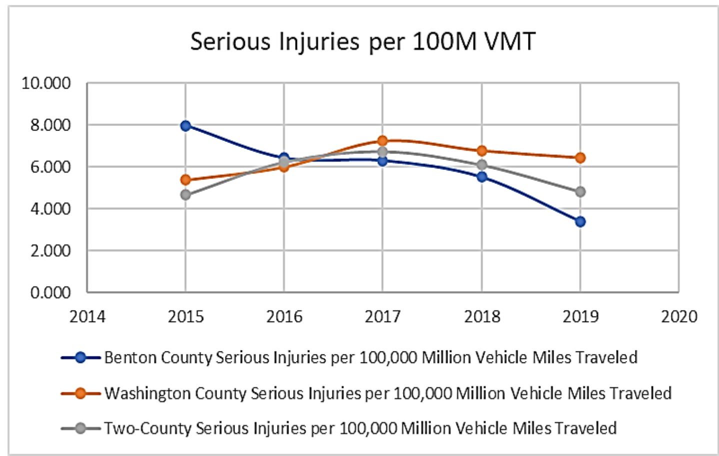
Source: National Highway Traffic Safety Administration - 2015-2019 Traffic Safety Facts Benton County, Arkansas; Washington County, Arkansas; and McDonald County, Missouri

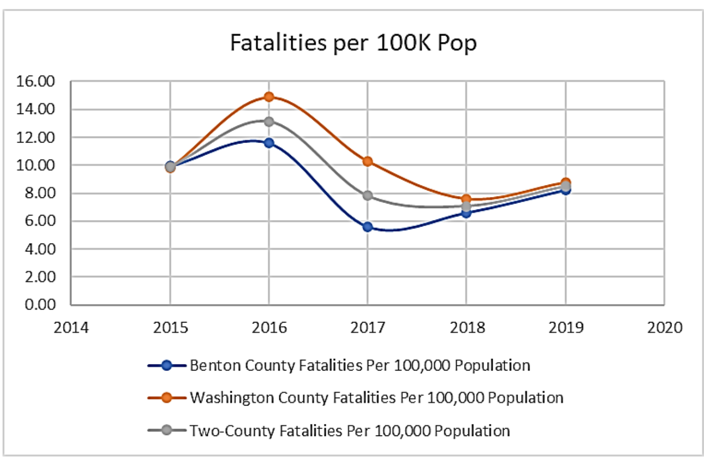
(1) Crash Involved at Least One Driver or Motorcycle Rider with a BAC of .08 or Above
(2) Crash Involved Only One Vehicle in Transport
(3) Crash Involved at Least One Large Truck
(4) Crash Involved at Least One Vehicle Speeding
(5) Crash Involved at Least One Vehicle that Rolled Over
(6) Crash Involved at Least One Vehicle that Departed the Roadway (FHWA Definition)
(7) Crash Occurred Within an Intersection or Within the Approach to an Intersection
*A Fatality Can Be in More Than One Category. Therefore, Sum of the Individual Cells Will Not Equal the Total Due to Double Counting

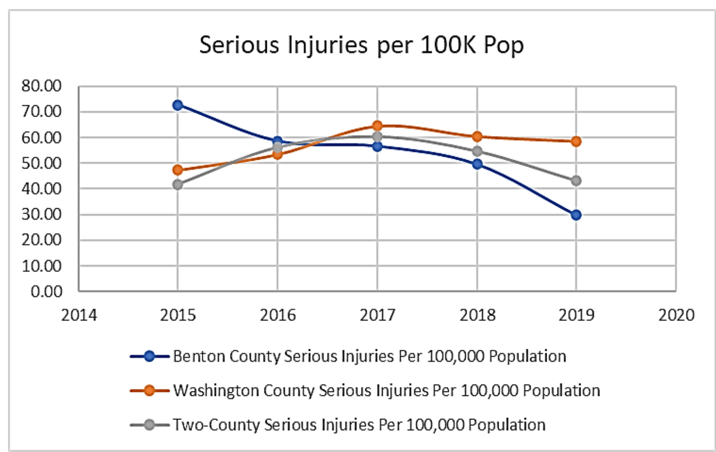

Fatalities
70
60
50
40
30
20
10
0
2014
2015
2016
2017
2018
2019
2020
Total Benton County Fatalities (All Crashes)
Total Washington County Fatalities (All Crashes)*
Total Benton & Washington County Fatalities (All Crashes)


Serious Injuries
350
300
250
200
150
100
50
0
2014
2015
2016
2017
2018
2019
2020
Total Benton County Serious Injuries ECRASH
Total Washington County Serious Injuries ECRASH
Total Benton & Washington County Serious Injury (All Crashes)


Fatalities per 100M VMT
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
2014
2015
2016
2017
2018
2019
2020
Benton County Fatalities per 100,000 Million Vehicle Miles Traveled
Washington County Fatalities per 100,000 Million Vehicle Miles Traveled
Two-County Fatalities per 100,000 Million Vehicle Miles Traveled


Serious Injuries per 100M VMT
10.000
8.000
6.000
4.000
2.000
0.000
2014
2015
2016
2017
2018
2019
2020
Benton County Serious Injuries per 100,000 Million Vehicle Miles Traveled
Washington County Serious Injuries per 100,000 Million Vehicle Miles Traveled
Two-County Serious Injuries per 100,000 Million Vehicle Miles Traveled


Fatalities per 100K Pop
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2014
2015
2016
2017
2018
2019
2020
Benton County Fatalities Per 100,000 Population
Washington County Fatalities Per 100,000 Population
Two-County Fatalities Per 100,000 Population


Serious Injuries per 100K Pop
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2014
2015
2016
2017
2018
2019
2020
Benton County Serious Injuries Per 100,000 Population
Washington County Serious Injuries Per 100,000 Population
Two-County Serious Injuries Per 100,000 Population

In 2019, Benton and Washington County fatalities per 100 million vehicles traveled was 0.955 which was below the national and state rate. The Arkansas rate was 1.36 fatalities per 100M VMT and the U.S. rate of 1.11 fatalities per 100M VMT. Benton and Washington County fatal crash rate for 2019 was 8.49 per 100,000. The national rate for 2019 was 11.00 per 100,000 and the rate for Arkansas was 16.73 per 100,000. Over the last five years the two-county area has been below the state and national fatality rate per 100,000.

Crashes: Fatalities and Serious Injuries	2015	2016	2017	2018	2019
Total Benton County Fatalities (All Crashes) FARS	25	30	15	18	23
Total Benton County Serious Injuries ECRASH	183	152	151	135	83
Total Benton County Population - July 1 Census ACS Est.	251,591	259,212	266,585	272,266	279,141
Benton County Annual Vehicle Miles Traveled	2,290,489,610	2,363,859,678	2,394,101,065	2,445,160,550	2,437,246,620
Benton County Fatalities Per 100,000 Population	9.94	11.57	5.63	6.61	8.24
Benton County Fatalities per 100,000 Million Vehicle Miles Traveled	1.091	1.269	0.627	0.736	0.944
Benton County Serious Injuries Per 100,000 Population	72.74	58.64	56.64	49.58	29.73
Benton County Serious Injuries per 100,000 Million Vehicle Miles Traveled	7.990	6.430	6.307	5.521	3.405
Total Washington County Fatalities (All Crashes) FARS	22	34	24	18	21
Total Washington County Serious Injuries ECRASH	106	122	150	143	140
Total Washington County Population - July 1 Census ACS Est.	224,434	228,482	232,732	236,611	239,187
Washington County Annual Vehicle Miles Traveled	1,966,612,335	2,031,306,588	2,074,622,405	2,111,235,190	2,170,837,500
Washington County Fatalities Per 100,000 Population	9.80	14.88	10.31	7.61	8.78
Washington County Fatalities per 100,000 Million Vehicle Miles Traveled	1.119	1.674	1.157	0.853	0.967
Washington County Serious Injuries Per 100,000 Population	47.23	53.40	64.45	60.44	58.53
Washington County Serious Injuries per 100,000 Million Vehicle Miles Traveled	5.390	6.006	7.230	6.773	6.449
Total Benton & Washington County Fatalities (All Crashes)	47	64	39	36	44
Total Benton & Washington County Serious Injury (All Crashes)	199	274	301	278	223
Total Two-County Population - July 1 Census ACS Est.	476,025	487,694	499,317	508,877	518,328
Two County Annual Vehicle Miles Traveled	4,257,101,945	4,395,166,266	4,468,723,470	4,556,395,740	4,608,084,120
Two-County Fatalities Per 100,000 Population	9.87	13.12	7.81	7.07	8.49
Two-County Fatalities per 100,000 Million Vehicle Miles Traveled	1.104	1.456	0.873	0.790	0.955
Two-County Serious Injuries Per 100,000 Population	41.80	56.18	60.28	54.63	43.02
Two-County Serious Injuries per 100,000 Million Vehicle Miles Traveled	4.675	6.234	6.736	6.101	4.839

Performance Measures, Targets, and System Performance Report

(MPO Supported ARDOT, MODOT, Ozark Transit Authority, and Razorback Transit -Targets)

In compliance with 23 U.S.C. 150 and 23 CFR 490, State DOTs are required to submit biennial performance reports for recurring four-year performance periods starting in 2018. In 2018, both State DOTS set 2-year targets and 4-year targets for all performance measures in Performance Measure Rules No. 2 and No. 3 (PM2 & PM3) in coordination with NWARPC. The first performance period takes place from January 1, 2018 to December 31, 2022. There is a total of three progress reports due for each performance period.

Baseline Performance Report (submitted October 1, 2018)

Mid-Performance Period Progress Report (October 1, 2020)

Full Performance Period Progress Report (October 1, 2022)

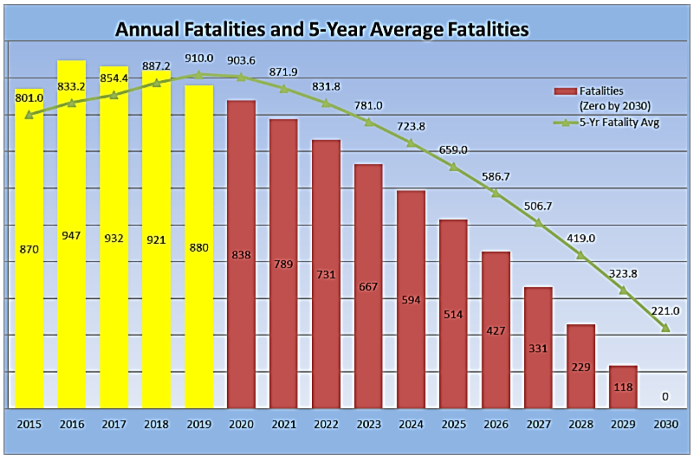
Both State DOTs are required to coordinate with NWARPC on the selection of targets to ensure consistency, to the maximum extent practicable. The following table provides the initial baseline and adjusted 2020 targets by both State DOT's and all required targets have been adopted by the NWARPC by Resolution to support the ARDOT and MODOT statewide targets.

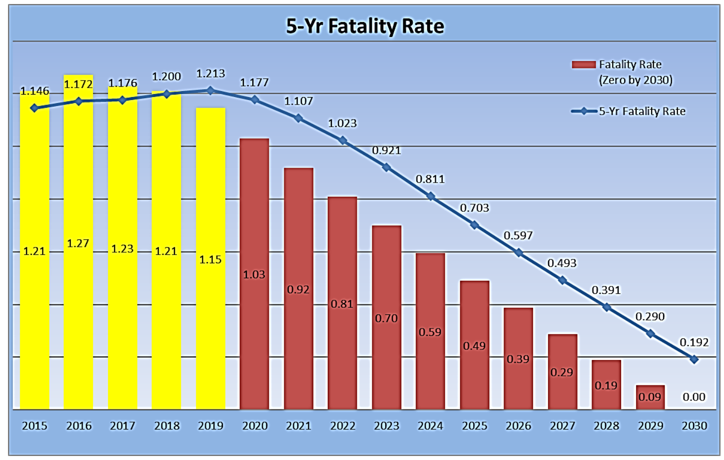
NWARPC SUPPORTED ARDOT AND MoDOT TARGETS
Northwest Arkansas Regional Planning Commission - September 26, 2018 - Res. No. 2018-13
Northwest Arkansas Regional Planning Commission - 2020 Safety Targets - January 22, 2020 - Res. No 2020-01
Northwest Arkansas Regional Planning Commission - 2021 Safety Targets And Mid-Performance Report Target Adjustments - December 2, 2020 - Res. No. 2020-07

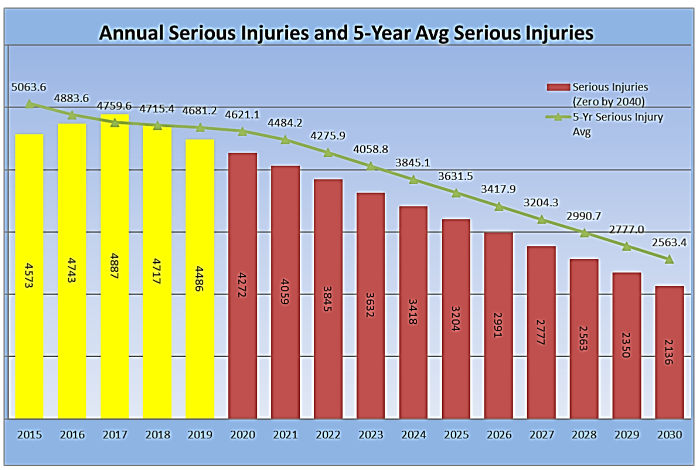
SAFETY	MoDOT Baseline	MoDOT CY 2018	MoDOT CY 2019	MoDOT CY 2020	MoDOT CY 2021	ARDOT 2013-2017 Baseline	ARDOT CY 2018	ARDOT CY 2019	ARDOT CY 2020	ARDOT CY 2021
Number of Fatalities	910.0	857.7	872.3	859.3	871.6	514.4	555	543	541.2	536.3
Fatality Rate per 100 Million VMT	1.213	1.163	1.160	1.130	1.119	1.474	1.662	1.615	1.595	1.560
Number of Serious Injuries	4,681.2	4,559.3	4,433.8	4,505.4	4,463.9	2,991.2	3,470.0	3,637.0	3,201.4	3,103.8
Serious Injury Rate per 100 Million VMT	6.241	6.191	6.168	5.953	5.829	8.584	10.419	10.824	9.441	9.043
Number of Non-Motorized Fatalities and Serious Injuries	462.2	431.9	445.4	437.4	462.2	149	149	170	300.3	220.3
PAVEMENTS	**MoDOT Baseline**	**MoDOT 2-year**	**MoDOT 4-year**	**MoDOT 2021 Target**		**ARDOT (IRI Only) Baseline (2018)***	**ARDOT (IRI Only) 2-year (2020)**	**ARDOT (IRI Only) 4-year (2022)**	**ARDOT (IRI Only) 2020 Mid-Performance Report - Current**	**ARDOT (IRI Only) 2022 Mid-Performance Report**
Percentage of Interstate Pavements in Good Condition	77.5%		77.5%	77.5%		77.0%		79.0%	78.0%	79.0%
Percentage of Interstate Pavements in Poor Condition	0.1%		0.0%	0.1%		4.0%		5.0%	4.0%	5.0%
Percentage of non-Interstate NHS Pavements in Good Condition	61.1%	61.1%	61.1%	61.1%		52.0%	48.0%	44.0%	56.0%	59.0%
Percentage of non-Interstate NHS Pavements in Poor Condition	1.0%	1.0%	1.0%	1.0%		8.0%	10.0%	12.0%	8.0%	7.0%
BRIDGE	**MoDOT Baseline**	**MoDOT 2-year**	**MoDOT 4-year**	**Revised MoDOT 2021 Target**		**ARDOT (2018) Baseline**	**ARDOT 2-year**	**ARDOT 4-year**	**ARDOT 2020 Mid-Performance Report Current 2020**	**ARDOT 2022 Mid-Performance Report 4-Year**
Percent of NHS bridges by deck area classified as Good condition	34.0%	30.9%	30.9%	26.4%		50.3%	50.0%	50.0%	44.5%	42.00%
Percent of NHS bridges by deck area classified as Poor condition	7.1%	7.1%	7.1%	8.2%		3.9%	4.0%	6.0%	3.6%	6.00%
TRAVEL TIME RELIABILITY	**MoDOT Baseline**	**MoDOT 2-year**	**MoDOT 4-year**	**Revised MoDOT 2021 Target**		**ARDOT (2018) Baseline**	**ARDOT 2-year**	**ARDOT 4-year**	**ARDOT 2020 Mid-Performance Report Current 2020**	**ARDOT Mid-Performance Report 4-Year**
Interstate Travel Time Reliability Measure: Percent of Reliable Person-Miles Traveled on the Interstate	91.6%	88.9%	87.1%	87.1%		95.0%	91.0%	89.0%	97.0%	93.0%
Non-Interstate Travel Time Reliability Measure: Percent of Reliable Person-Miles Traveled on the Non-Interstate NHS	92.3%		87.8%	87.8%		96.0%		90.0%	96.0%	92.0%
Freight Reliability Measure: Truck Travel Time Reliability Index	1.25	1.28	1.30	1.45		1.21	1.45	1.52	1.21	1.40

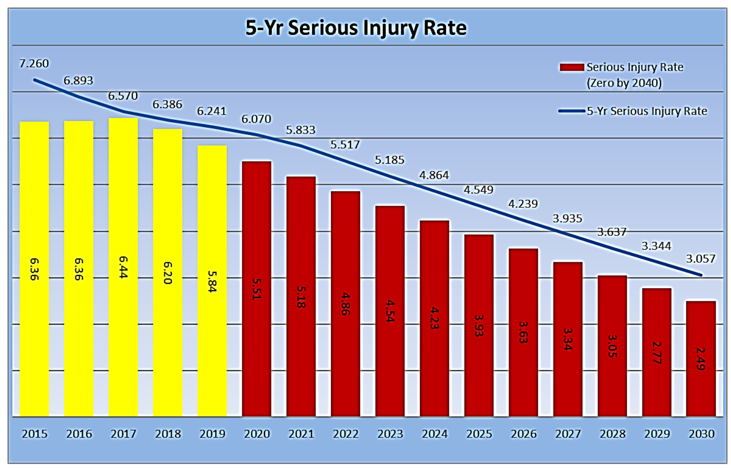
NWARPC continues to program projects in the Transportation Improvement Program in order to achieve progress in meeting performance targets. The following charts provide statewide performance data and progress for each target compared to previous reports, including baseline data.

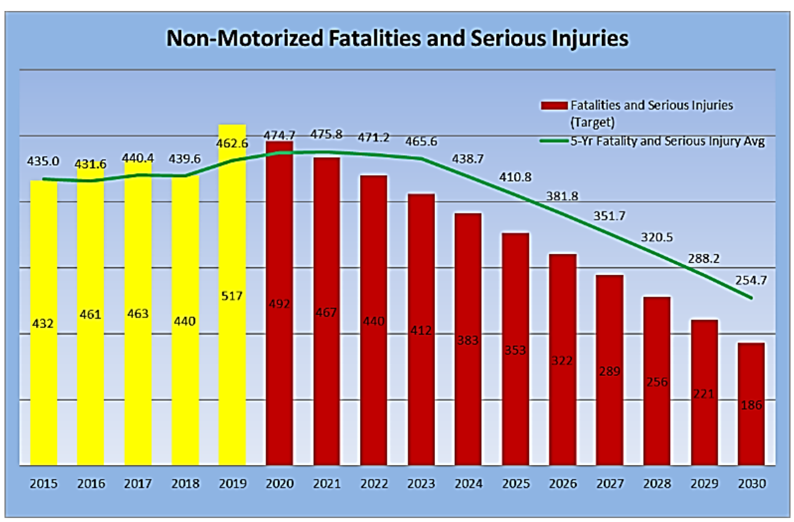
Missouri Safety Progress



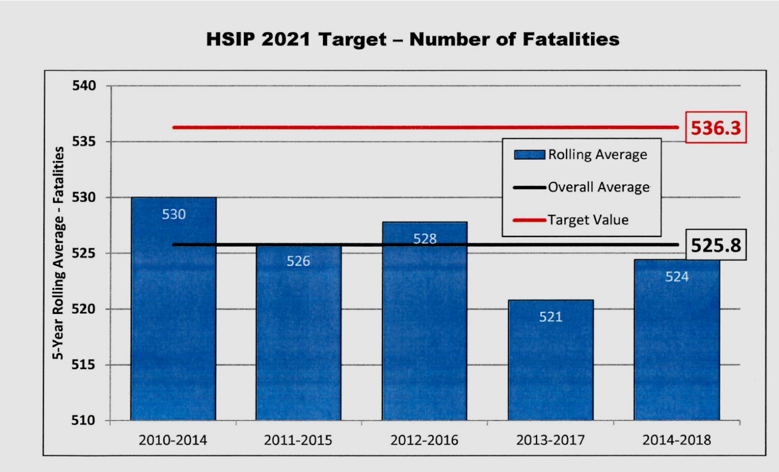


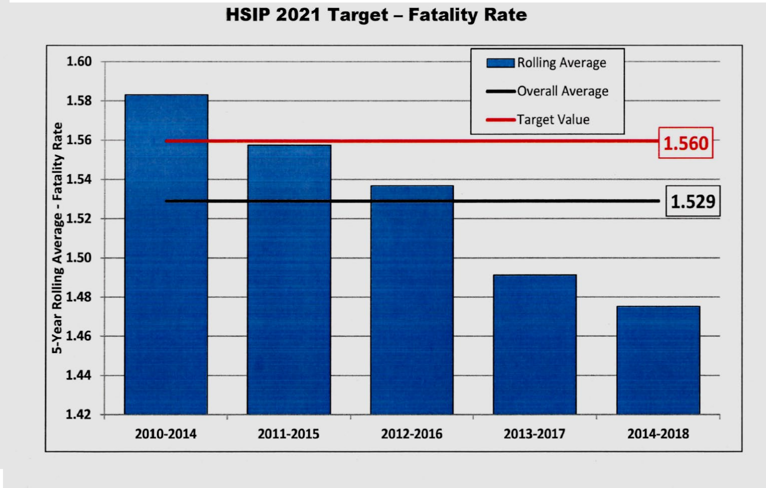


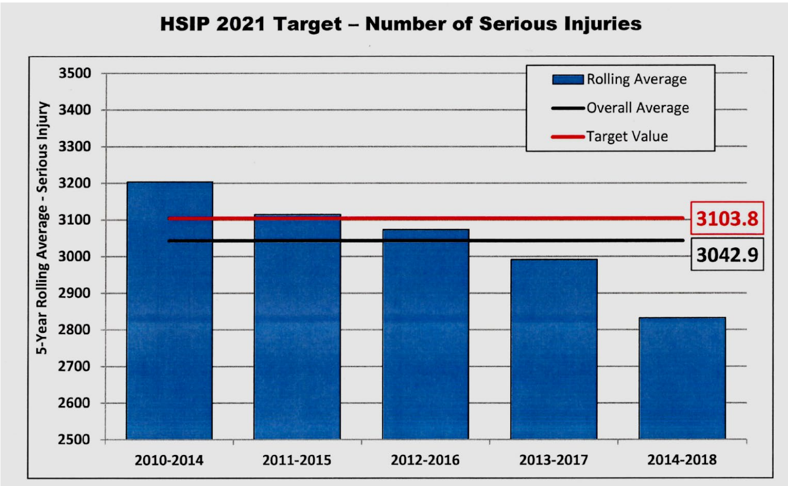


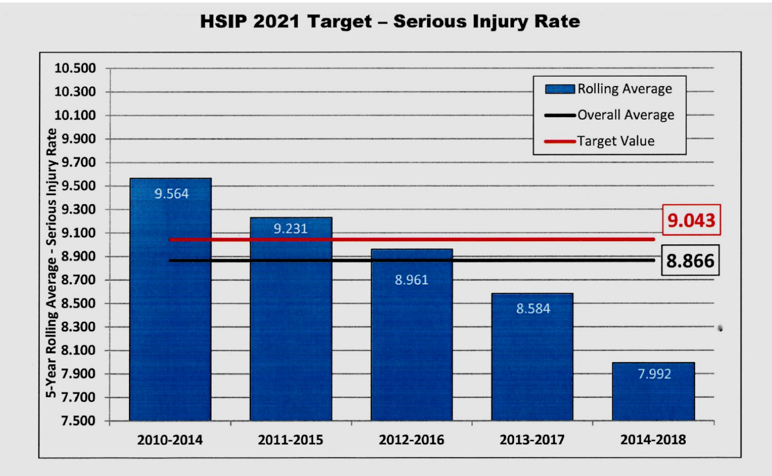


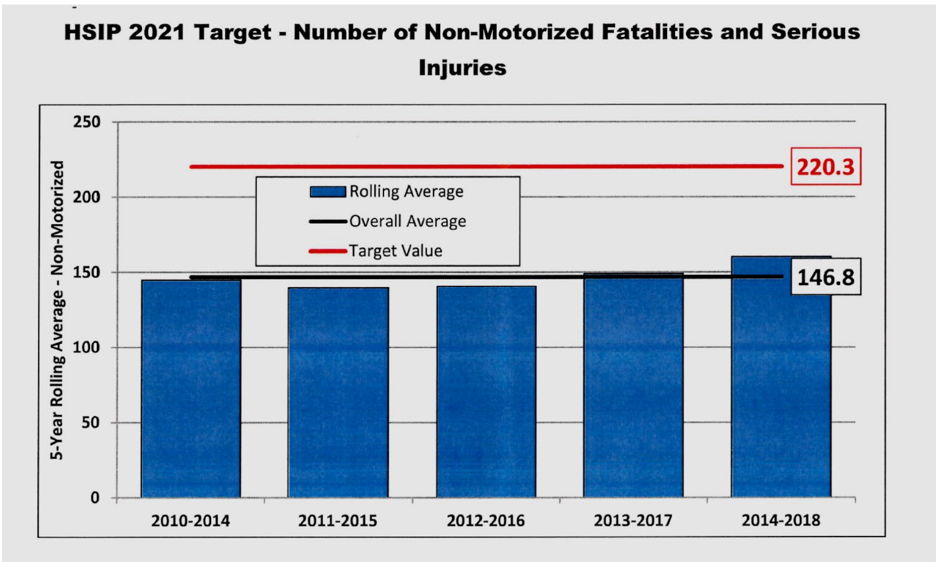
Arkansas Safety Progress



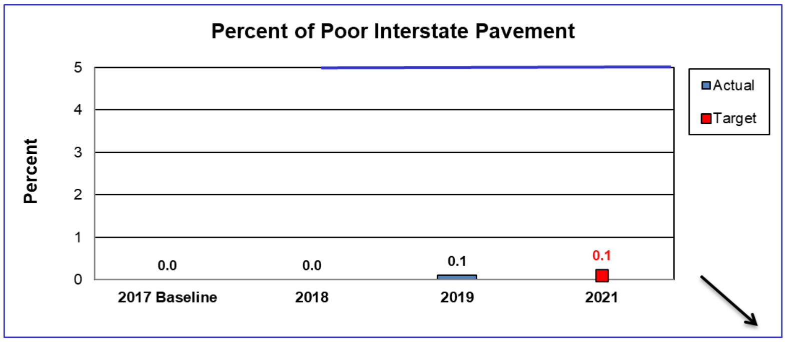


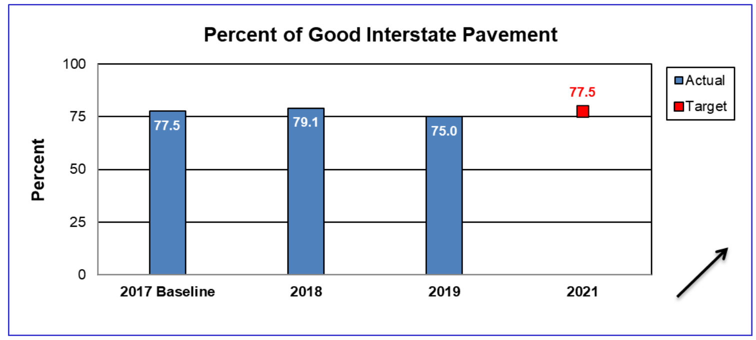


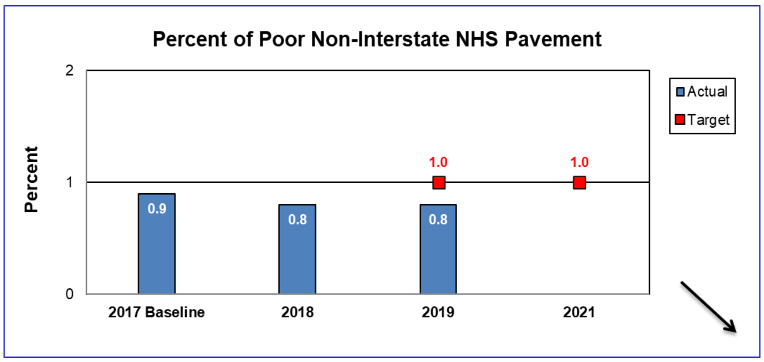


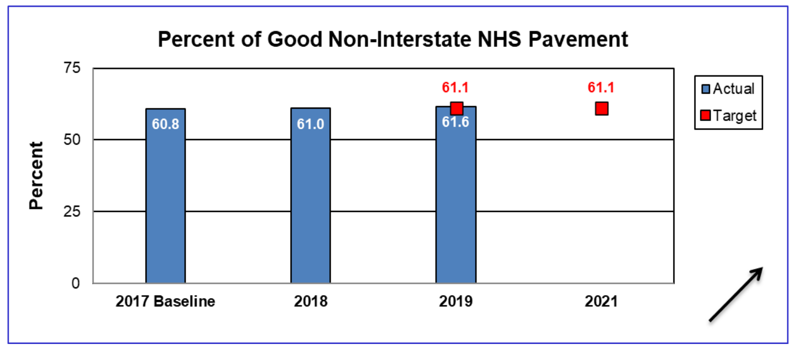


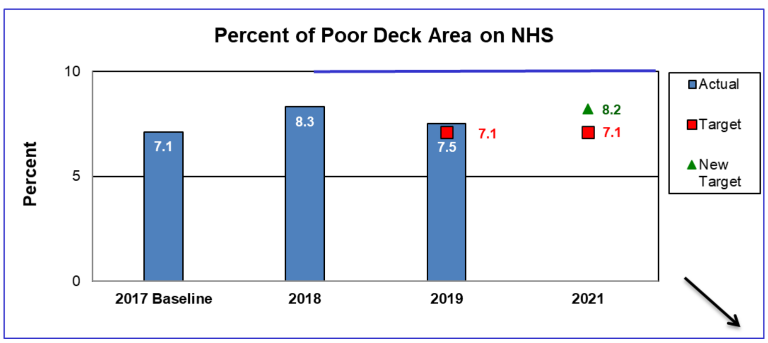
Missouri Pavement and Bridge Deck Progress

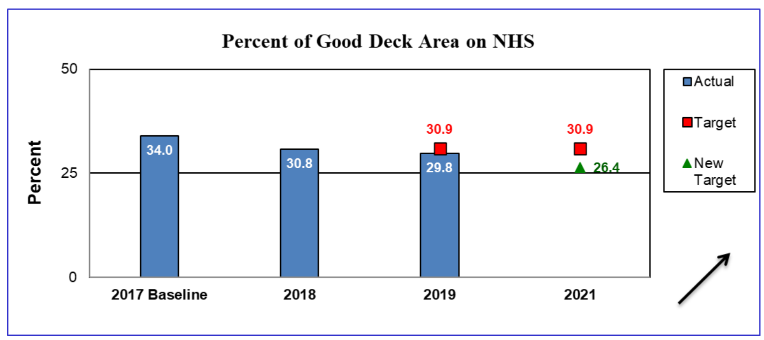


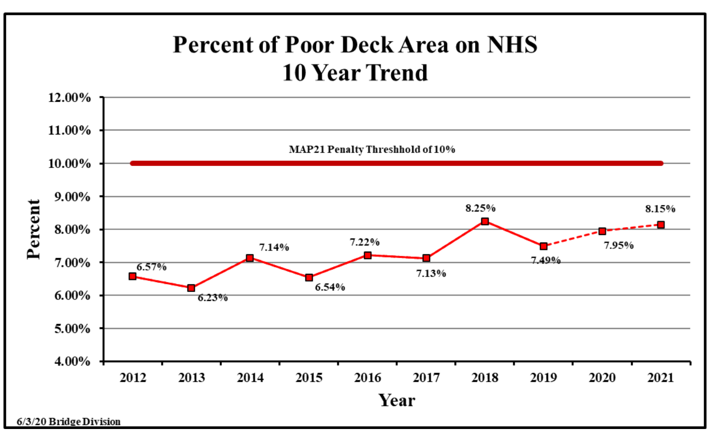


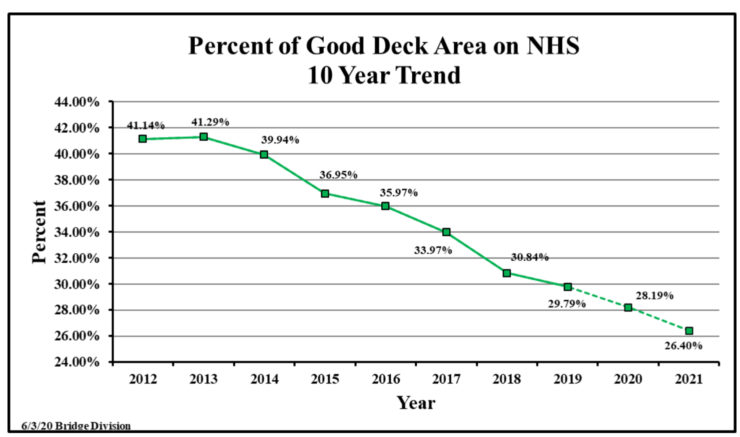












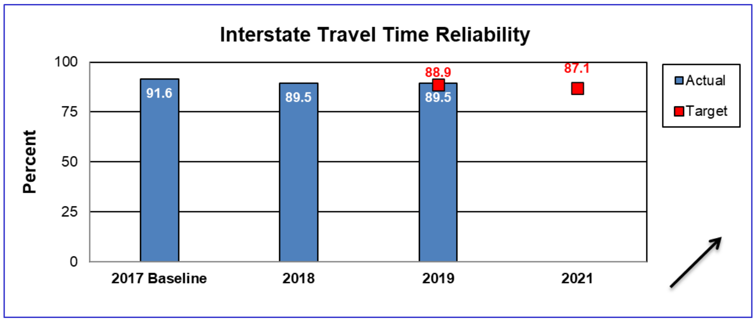
Arkansas Pavement and Bridge Deck Progress

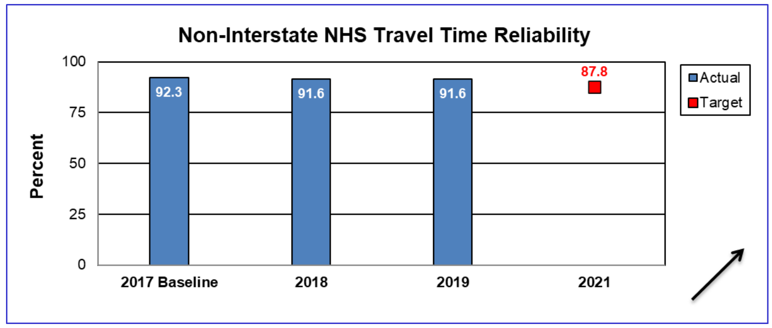
2018 Baseline Performance Report (IRI Only)			
	Baseline (2018) *	2-year (2020)	4-year (2022)
Percent of Interstate pavements in Good condition	77%	N/A	79%
Percent of Interstate pavements in Poor condition	4%	N/A	5%
Percent of non-Interstate NHS pavements in Good condition	52%	48%	44%
Percent of non-Interstate NHS pavements in Poor condition	8%	10%	12%
2020 Mid-Performance Report (IRI Only)			
		Current (2020) ^	4-year (2022) #
Percent of Interstate pavements in Good condition		78%	79%
Percent of Interstate pavements in Poor condition		4%	5%
Percent of non-Interstate NHS pavements in Good condition		56%	59%
Percent of non-Interstate NHS pavements in Poor condition		8%	7%

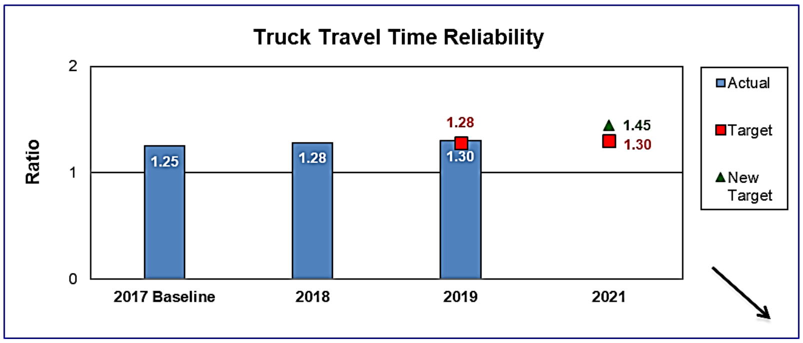
* Condition rating based on ARDOT's 2017 HPMS pavement dataset – IRI Only
^ Condition rating based on ARDOT's 2019 HPMS pavement dataset – IRI Only
# Condition rating based on ARDOT's 2021 Projected pavement dataset – IRI Only

2018 Baseline Performance Report			
	Baseline (2018)	2-year (2020)	4-year (2022)
Percent of NHS bridges by deck area classified as Good condition	50.3%	50.0%	50.0%
Percent of NHS bridges by deck area classified as Poor condition	3.9%	4.0%	6.0%
2020 Mid-Performance Report			
		Current (2020)	4-year (2022)
Percent of NHS bridges by deck area classified as Good condition		44.5%	42.0%
Percent of NHS bridges by deck area classified as Poor condition		3.6%	6.0%

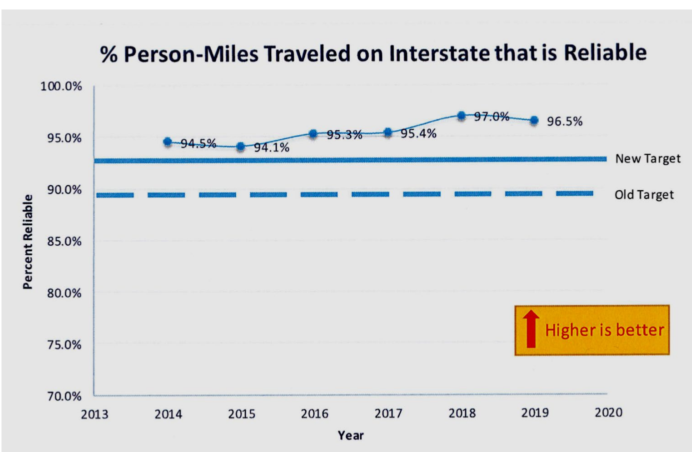
Missouri Reliability Progress

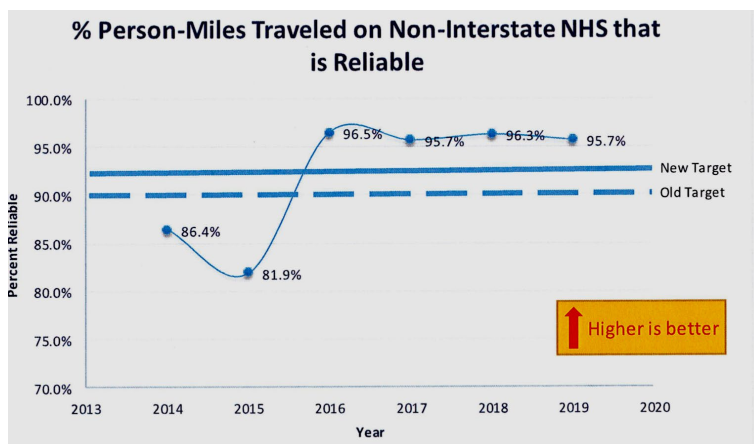


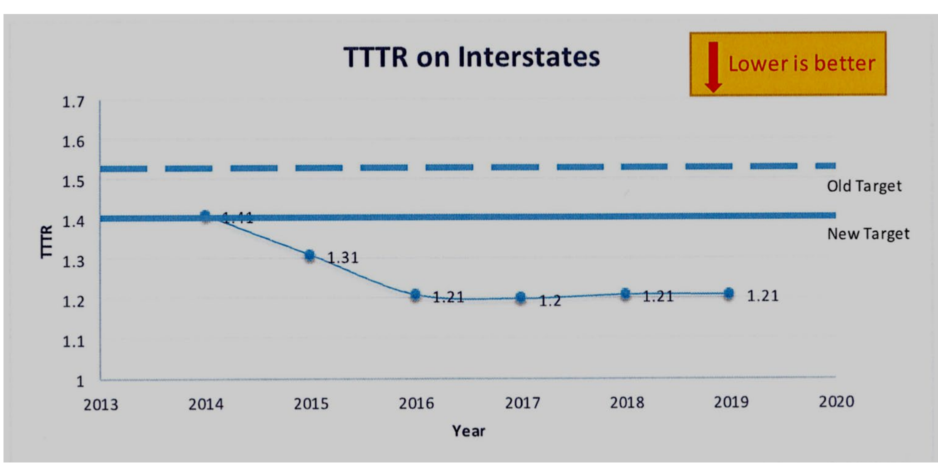




Arkansas Reliability Progress







PUBLIC TRANSPORTATION AGENCY SAFETY PLANS

The Federal Transit Agency (FTA) published a final rule on July 19, 2018 for Public Transportation Agency Safety Plans as authorized by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation (FAST) Act. The final rule requires states and certain operators of public transportation systems that receive federal financial assistance under 49 U.S.C. Chapter 53 to develop Public Transportation Agency Safety Plans (PTASP). Each PTASP must:

- Include the documented processes and procedures for the transit agency's Safety Management Systems (SMS), which consists of four main elements: (1) Safety Management Policy (including performance measures and targets), (2) Safety Risk Management, (3) Safety Assurance, and (4) Safety Promotion (49 CFR 673.11(a)(2));

- Include performance targets based on the safety performance criteria established under the National Public Transportation Safety Plan (49 CFR 673.11(a)(3));

- Address all applicable requirements and standards as set forth in FTA's Public Transportation Safety Program and National Public Transportation Safety Plan (49 CFR 673(q)(4)); and

- Establish a process and timeline for conducting an annual review and update of the Public Transportation Agency Safety Plan (49 CFR 673.11(a)(5)).

To improve public transportation safety to the highest practicable level in the State of Arkansas and comply with FTA requirements, ARDOT developed individual Public Transit Agency Safety Plans (PTASP) for Ozark Transit Authority (ORT) and University of Arkansas Razorback Transit (Razorback Transit) in collaboration with NWARPC, the MPO for the region, and both transit agencies. The ORT PTASP was adopted on June 25, 2020, and the Razorback Transit PTSAP was adopted on June 29, 2020. ARDOT certified on July 20, 2020 that both transit agencies' plans are in full compliance with 49 CFR Part 673.

Transit agencies must make their safety performance targets available to States and Metropolitan Planning Organizations (MPO) to aid in the planning process. NWARPC is reflecting the transit agencies' targets in the Metropolitan Transportation Plan (MTP), and supports linking investment priorities from the Transportation Improvement Program (TIP) to achieve transit performance targets.

Baseline 2018 Ozark Regional Transit and 2019 Razorback Transit Safety Performance Measures	Fatalities	Rate of Fatalities*	Injuries	Rate of Injuries*	Safety Events	Rate of Safety Events*	Mean Distance Between Major Mechanical Failure
Razorback Transit Fixed Route (Bus)	0	0	5	0.0000019	6	0.0000023	378,555
Ozark Regional Transit Fixed Route (Bus)	0	0	0	0	0	0	26,244
Razorback Transit Demand Response	0	0	2	0.000007	2	0.000007	286,140
Ozark Regional Transit Demand Response	0	0	0	0	0	0	29,194

Mode Fixed Route (Bus) Safety Performance Targets	Baseline	Target
Razorback Transit (Bus) Fatalities	0	0
Ozark Regional Transit (Bus) Fatalities	0	0
Razorback Transit (Bus) Rate of Fatalities*	0	0
Ozark Regional Transit (Bus) Rate of Fatalities	0	0
Razorback Transit (Bus) Injuries	5	5
Ozark Regional Transit (Bus) Injuries	0.2	0
Razorback Transit (Bus) Rate of Injuries*	0.0000019	0.0000019
Ozark Regional Transit (Bus) Rate of Injuries	0.00003	0.00000
Razorback Transit (Bus) Safety Events	6	6
Ozark Regional Transit (Bus) Safety Events	0.2	0
Razorback Transit (Bus)Rate of Safety Events*	0.0000023	0.0000023
Ozark Regional Transit (Bus) Rate of Safety Events	0.00003	0.00000
Razorback Transit (Bus) Mean Distance Between Major Mechanical Failure	378,555	378,555
Ozark Regional Transit (Bus) Mean Distance Between Major Mechanical Failure	17,233	0
*Rate = total number for the year/total revenue vehicle miles traveled		

Mode Demand Response	Baseline	Target
Razorback Transit Fatalities	0	0
Ozark Regional Transit Fatalities	0	0
Razorback Transit Rate of Fatalities*	0	0
Ozark Regional Transit Rate of Fatalities	0	0
Razorback Transit Injuries	2	2
Ozark Regional Transit Injuries	0	0
Razorback Transit Rate of Injuries*	0.000007	0.000007
Ozark Regional Transit Rate of Injuries	0	0
Razorback Transit Safety Events	2	2
Ozark Regional Transit Safety Events	0.2	0
Razorback Transit Rate of Safety Events*	0.000007	0.000007
Ozark Regional Transit Rate of Safety Events	0.00008	0
Razorback Transit Mean Distance Between Major Mechanical Failure	286,140	286,140
Ozark Regional Transit Mean Distance Between Major Mechanical Failure	39,997	0
Razorback Transit Other	NA	NA
Ozark Regional Transit Other	NA	NA
*Rate = total number for the year/total revenue vehicle miles traveled		

TRANSIT ASSET MANAGEMENT

The Federal Transit Administration issued a final rule on Transit Asset Management (TAM) that became effective on October 1, 2016. This final rule requires public transportation providers to develop and implement a Transit Asset Management plan. The TAM plan must include, at a minimum, an asset inventory, condition assessments of inventoried assets, description of a decision support tool and a prioritized list of investments to improve the state of good repair of their capital assets.

Asset Category			FY2019	FY2020	FY2021	FY2022	FY2023
Revenue Vehicles							
Age - % of revenue vehicles within a particular asset class that have exceeded their age ULB	*BU - Bus*		25%	25%	20%	20%	20%
	CU - Cutaway Bus		25%	25%	20%	20%	20%
	MV - Mini-van		25%	25%	20%	20%	20%
Mileage - % of revenue vehicles within a particular asset class that have exceeded their mileage ULB	*BU - Bus*		25%	25%	20%	20%	20%
	CU - Cutaway Bus		25%	25%	20%	20%	20%
	MV - Mini-van		25%	25%	20%	20%	20%
Cumulative Condition Score - % of revenue vehicles within a particular asset class that score below 2.0 on the TERM Scale	*BU - Bus*		25%	25%	20%	20%	20%
	CU - Cutaway Bus		25%	25%	20%	20%	20%
	MV - Mini-van		25%	25%	20%	20%	20%
Equipment							
Cumulative Condition Score - % of non-revenue vehicles within a particular asset class that score below 2.0 on the TERM Scale	*Non-Revenue/Service Vehicle*		50%	50%	50%	50%	50%
Facilities							
Condition Score - % of Facilities that score below 2.0 on the TERM Scale	*Administration*		25%	25%	25%	25%	25%
	Maintenance		25%	25%	25%	25%	25%
	Passenger Facilities		25%	25%	25%	25%	25%

Transit providers are required to set performance targets for their capital assets based on SGR measures and report their targets, as well as information related to the conditions of their capital assets, to the National Transit Database.

In addition, FTA has required that MPO's approve performance targets for the TAM Plan within 180 days of the TAM plan approvals for the agencies. Per FTA guidance, one set of performance targets is recommended for the region as opposed to individual goals for each agency represented in the MPO area.

In coordination with Ozark Regional Transit and Razorback Transit, the following table details the performance targets for each of the asset classes required in the TAM Plans.

ANTICIPATED EFFECT OF THE NARTS FFY 2021-2024 TRANSPORATION IMPROVEMENT PROGRAM (TIP) TOWARD ACHIEVING THE PERFORMANCE TARGETS

PERFORMANCE-BASED APPROACH – METROPOLITAN TRANSPORTATION PLANNING

The FAST Act includes requirements for the MPO to establish and use a "performance-based approach to transportation decision making" that supports FAST Act National Goals. The NARTS MPO continues to coordinate with ARDOT and MoDOT on the establishment of a "performance-based approach" to transportation planning and the establishment of MPO "performance measures and performance targets" that support state DOT performance measures and targets.

ARDOT and MoDOT, in accordance with 23 CFR 450.218, have each developed a statewide Transportation Improvement Program (STIP) that includes, to the maximum extent practicable, a discussion of the anticipated effect of the STIP toward achieving identified performance targets. These targets are identified in statewide long-range transportation plans, or other state performance-based plan(s) that link investment priorities to those performance targets.

NWARPC passed Resolution No. 2018-13, Resolution No. 2020-01, and Resolution No. 2020-07 supporting both ARDOT's and MoDOT's established performance targets. NWARPC has agreed to plan and program projects in support of the performance targets for Safety, Pavement Condition, Bridge Condition, and Travel Time Reliability. NWARPC has passed Resolution No. 2018-12 and Resolution No. 2020-12 supporting the TAM and Safety Targets for Ozark Transit Authority and Razorback Transit.

ANTICIPATED EFFECT OF THE ARDOT STIP/NARTS TIP TOWARD ACHIEVING THE PERFORMANCE TARGETS:

1) **Safety**

   Since 2013, Arkansas has adopted an ultimate vision of Toward Zero Deaths (TZD). The Strategic Highway Safety Plan (SHSP) was developed with the TZD vision, and integrated the four "E's" – engineering, education, enforcement, and emergency services. The SHSP is a performance-based, data-driven, comprehensive plan that established statewide goals, objectives, and strategies to address safety in Arkansas. The vision and strategy included in the SHSP is consistent with the TZD National Strategy on Highway Safety sponsored by the FHWA, AASHTO, the National Highway Traffic Safety Administration (NWTSA), and the Governor's For more information visit this link.

2)

   The 2017 SHSP identified five **critical emphasis areas** including Driver Behavior; Infrastructure Improvement; Special Road Users; Vulnerable Road Users; and Operational Improvements. Performance goals can be found in the SHSP for the following federally mandated performance measures:

   - Number of fatalities
   - Fatality rate
   - Number of serious injuries
   - Serious injury rate
   - Number of non-motorized fatalities and serious injuries

Additionally, ARDOT develops annual performance targets to support the SHSP goals in accordance with 23 U.S.C. 150. The targets are developed in coordination with the Arkansas State Police-Highway Safety Office, MPOs, and other stakeholders. The targets are submitted to FHWA in the Highway Safety Improvement Program (HSIP) report by August 31 each year.

The 2017 SHSP relevant **primary emphasis areas** under the critical emphasis areas of Infrastructure and Operational Improvements include roadway departure, intersections, work zones, railroad crossings as well as incident management and data collection and analysis. Safety projects included in the STIP/TIP were identified to address the critical and primary emphasis areas in support of the SHSP performance goals. These projects were identified through a data-driven process, and are in conformance with the HSIP requirements. The process includes:

- Evaluation of the safety performance of an area
- Identification of appropriate countermeasures that would address one or more SHSP primary emphasis areas
- Determination of benefits versus costs

These projects are intended to move the State toward achieving the performance goals identified in the SHSP through a positive effect on the State's highway safety performance. An evaluation of safety effectiveness for these projects is conducted annually through the HSIP report.

2) Transit

The NARTS MPO is required, through Transit Asset Management Plans (TAMs) and Public Transit Agency Safety Plans (PTASP), to coordinate with transit providers (ORT and Razorback Transit), set performance targets, and integrate those performance targets and performance plans into its planning document(s).

FTA grant recipients are required to utilize performance-driven, outcome-based programs. As part of this approach, recipients are required to link investment priorities from the STIP/TIP to achieve performance targets based upon the grant recipient's TAM and PTASP plans.

3) Infrastructure Condition

In order to manage the State Highway System, ARDOT has developed the Transportation Asset Management Plan (TAMP) compliant with 23 CFR 515 with the goal of maintaining the system in the best possible condition for the given amount of funding available. The TAMP is a risk-based document and describes the inventory and condition of Arkansas highways and bridges located on the National Highway System (NHS). It also describes how ARDOT is managing these assets using transportation asset management principles. Using life-cycle information contained in the TAMP assists ARDOT in identifying the correct projects at the correct times to reduce the overall cost of State assets, while maintaining a safe and efficient system.

Federally mandated performance measures are:

- Percent of Interstate pavements in Good condition
- Percent of Interstate pavements in Poor condition
- Percent of non-Interstate NHS pavements in Good condition
- Percent of non-Interstate NHS pavements in Poor condition
- Percent of NHS bridges by deck area classified as Good condition
- Percent of NHS bridges by deck area classified as Poor condition

A number of jobs in the STIP/TIP, in accordance with the TAMP, will implement system preservation, reconstruction, or structures and approaches (bridge replacement) type of work. These projects are intended to maintain highway assets in the state-of-good-repair and achieve performance targets.

Preservation projects are implemented expeditiously as needs are identified, and are aided by additional funding made available through various state initiatives. The condition of the State highway system is reported annually to FHWA in the Highway Performance Monitoring System (HPMS).

4) System Reliability and CMAQ (Note: the NARTS MPA does not fall under CMAQ guidelines.)

System reliability on the Interstate and non-Interstate NHS is assessed using FHWA's National Performance Management Research Data Set (NPMRDS) for travel time reliability and freight movement. **Travel time reliability** is defined as the ratio of the longer travel time (80^{th} percentile) to a normal travel time (50^{th} percentile). Roadway segments that have a travel time reliability greater than 1.5 are considered unreliable. **Freight reliability** is based on the truck travel time reliability index that is defined as the 95^{th} percentile truck travel time divided by the 50^{th} percentile truck travel time.

Federally mandated performance measures are:

- Percent of person-miles traveled on the Interstate that are reliable
- Percent of person-miles traveled on the non-Interstate NHS that are reliable
- Truck travel time reliability on the Interstate System
- Other measures are not applicable in the NARTS MPA

The Connecting Arkansas Program (CAP) has been the primary vehicle to increase the reliability of the State highway system. Many of the unreliable segments across the State will be addressed with the completion of CAP. The State highways are monitored continuously to ensure a safe and efficient transportation system is provided. As needs arise, projects are identified and implemented. System performance is reported annually to FHWA through the Highway Performance Monitoring System (HPMS). Arkansas State Freight Plan Executive Summary. For more information visit this link.

ANTICIPATED EFFECT OF THE MODOT STIP/NARTS TIP/ NWARPC MTP 2045 TOWARD ACHIEVING THE PERFORMANCE TARGETS:

1) Safety

While maintaining the existing transportation system remains a priority, MoDOT is also committed to making safety improvements to the system in order to reduce the number of fatalities and serious injuries on Missouri roadways. In 2019 there were 811 traffic fatalities and the 10-year fatality total for the state was 8,506. MoDOT, in conjunction with the Missouri Coalition for Roadway Safety, has developed a **strategic highway safety plan**, *Show-Me ZERO – Driving Missouri Toward Safer Roads*, that identifies emphasis areas and corresponding strategies for reducing fatalities and serious injuries. While *Show-Me Zero* continues a multi-disciplined approach to safer roads through education, public policy, enforcement, engineering and emergency response, a focus on addressing four key behaviors during the next five years has been added: occupant protection, distracted driving, speed and aggressive driving, and impaired driving. Additionally, the plan focuses on three roadway user groups: teen drivers, older drivers, pedestrians and other non-motorized users. *Show-Me Zero* continues the ultimate goal of achieving zero traffic fatalities. Interim goals for 2020 of 838 fatalities and for 2021 789 fatalities, or fewer, have also been established. Reducing fatalities and serious injuries requires effort from partners throughout the state across multiple disciplines. MoDOT is committed to improving safety through both transportation projects and outreach efforts alongside its safety partners. In the 2020-2024 STIP, MoDOT has programmed approximately $170.6 million in the first three years to help move MoDOT towards the federal safety performance targets. Missourians expect to get to their destinations on time, without delay regardless of their choice of travel mode. MoDOT coordinates and collaborates with its transportation partners throughout the state to keep people and goods moving freely and efficiently.

2) Infrastructure Condition

MoDOT has adopted a statewide transportation asset management approach to make the best decisions with transportation investments. MoDOT's **Asset Management Plan (AMP)** is a crucial element in achieving MoDOT's strategic **goal of keeping roads and bridges in good condition**. The AMP is a rolling 10-year strategic framework for making cost-effective decisions about allocating resources and managing road and bridge system infrastructure. It is based on a process of monitoring the physical condition of assets and predictingdeterioration over time and providing information on how to invest in order to meet asset management goals.

The AMP objective is to keep the state's transportation assets in good condition over the life cycle of those assets at the most practical cost. Based on current funding constraints, the goal of the AMP is to maintain existing pavement and bridge conditions. In the 2020-2024 STIP, MoDOT has programmed approximately $2.7 billion in the first three years to move MoDOT towards the federal bridge and pavement performance targets. MoDOT AMP Summary: https://epg.modot.org/index.php/121.5_Asset_Management

3) System Reliability

System performance on the Interstate and non-Interstate National Highway System (NHS) is measured and assessed using a combination of Federal Highway Administration's (FHWA) National Performance Management Research Data Set (NPMRDS) and other traffic data made available to the department. These data sets allow MoDOT to assess congestion, travel time reliability, and freight movement along the state's most heavily traveled roadways. Unreliable roadways are generally the result of variable events that adversely impact travel. Specifically, a high frequency of crashes or ongoing construction that block travel lanes can have significant impacts on the reliability of a roadway. Likewise, adverse weather and spikes in traffic volumes and for large events (concerts, sporting events, festivals) can also lead to unreliable conditions. The majority of STIP projects are designated for preserving the condition of the state's road and bridge conditions. However, where funding allows, MoDOT programs projects aimed at improving reliability and reducing congestion on the busiest corridors in the state. In some cases, this can mean individual construction projects aimed at improving the safety, capacity, and efficiency of a roadway. In addition, MoDOT funds system management and operations functions to help improve reliability. These functions include services such as Transportation Management Centers in St. Louis, Kansas City, and Springfield, emergency response crews on the state's major highways, and intelligent transportation systems to provide customers with real-time information to increase the likelihood of a reliable trip. In the 2020-2024 STIP, MoDOT has programmed projects and services to move MoDOT towards the federal system reliability and congestion performance targets.

MoDOT has also developed a statewide freight plan to help the department make smarter decisions and investments to optimize Missouri's ability to move products throughout the state. The freight plan, updated in 2017, will help the state better prepare for necessary improvements to facilitate a reliable movement of goods well into the future. In the 2020-2024 STIP, MoDOT has programmed projects to move MoDOT towards the federal freight performance target.
2017 Missouri State Freight Plan: https://www.modot.org/freight-plan Source: MoDOT 2020-2024 STIP
https://www.modot.org/sites/default/files/documents/Sec02Introduction_3.pdf

PROJECTS ANTICIPATED EFFECT OF THE NARTS TIP TOWARD ACHIEVING THE PERFORMANCE TARGETS

HIGHWAY 112 IMPROVEMENTS

Highway 112 is a two-lane highway that parallels I-49 on the west. It traverses through or near several environmentally sensitive areas, including the Cave Springs Recharge Area. The posted speed limit ranges from 30 to 55 miles per hour, with several areas of reduced advisory speeds located throughout the corridor. It is the only continuous North-South route west of I-49, serving local and regional traffic between Fayetteville and Bentonville, making it crucial for regional mobility.

At the request of the NWARPC, the Arkansas State Highway Commission passed Minute Order 2012-027, which authorized a study of Highway 112 from Fayetteville to Bentonville, a total length of approximately 20 miles. The purpose of the Study was to determine the feasibility of improvements to Highway 112 to address capacity and safety needs that will improve reliability, reduce congestion, reduce serious and fatal crashes and develop an urban arterial that address all modes of transportation.

With the exception of the northernmost portion of Highway 112, the corridor currently has two 10-foot lanes and no shoulders. Due to the continuing urban development in the area, much of the route is transitioning from a rural to an urban setting with almost the entire corridor now located within the city limits of eight cities. The southern portion of the Study area has the highest traffic volumes with approximately 17,000 vehicles per day (vpd) south of

Drake Street (in Fayetteville) and 23,000 vpd at the I-49 interchange. Highway 112 south of Drake Street is also a Razorback Transit bus route.

The improvement alternative considered as part of the Study would widen Highway 112 to four travel lanes, with a complete street cross-section, improve geometry, and provide access management based on FHWA Proven Safety

Strategies to manage access such as adequate driveway spacing, a raised median, and deceleration lanes will be necessary to maximize operations and safety through this corridor.

Highway 112 Projects programmed in the TIP include:

JOB #	FFY	TERMINI
040720	2021	Poplar St. - Drake St. (Fayetteville) (S)
040746	2022	Truckers Dr. – Howard Nickell Rd. (Fayetteville) (S)
012305	2023	Hwy. 412 - Springdale Bypass (S)
04X050	TBD	Fayetteville - Hwy. 412 (S)
04X296	2023	Don Tyson Pkwy. - Hwy. 412 (Springdale & Tontitown)
09X322	2023	Pleasant Grove Rd. - Hwy. 12 (Bentonville & Cave Springs)

NWARPC Supported DOT Performance Targets: Truck Travel Time Reliability, Travel Time Reliability, Number and Rate of Serious Injury and Fatal Crashes, and Pavement Condition.

Hwy 112 Implementation of FHWA Supported Proven Safety Countermeasures:


U.S. Department of Transportation
Federal Highway Administration

PROVEN SAFETY COUNTERMEASURES

Corridor Access Management

Access management refers to the design, application, and control of entry and exit points along a roadway. This includes intersections with other roads and driveways that serve adjacent properties. Thoughtful access management along a corridor can simultaneously enhance safety for all modes, facilitate walking and biking, and reduce trip delay and congestion.

A raised median reduces conflict points along this roadway.
Source: Missouri DOT

Every intersection, from a signalized intersection to an unpaved driveway, has the potential for conflicts between vehicles, pedestrians, and bicycles. The number and types of conflict points—locations where the travel paths of two users intersect—influence the safety performance of the intersection or driveway.

The following access management strategies can be used individually or in combination with one another:

- Driveway closure, consolidation, or relocation.
- Limited-movement designs for driveways (such as right-in/right-out only).
- Raised medians that preclude across-roadway movements.
- Intersection designs such as roundabouts or those with reduced left-turn-conflicts (such as J-turns, median U-turns, etc.).
- Turn lanes (i.e., left-only, right-only, or interior two-way left).
- Lower speed one-way or two-way off-arterial circulation roads.

Successful corridor access management involves balancing overall safety and corridor mobility for all users along with the access needs of adjacent land uses.

This intersection design restricts left-turn movements to improve safety.
Source: FHWA

SAFETY BENEFITS:

5-23%
Reduction in total crashes along 2-lane rural roads

25-31%
Reduction in injury and fatal crashes along urban/suburban arterials

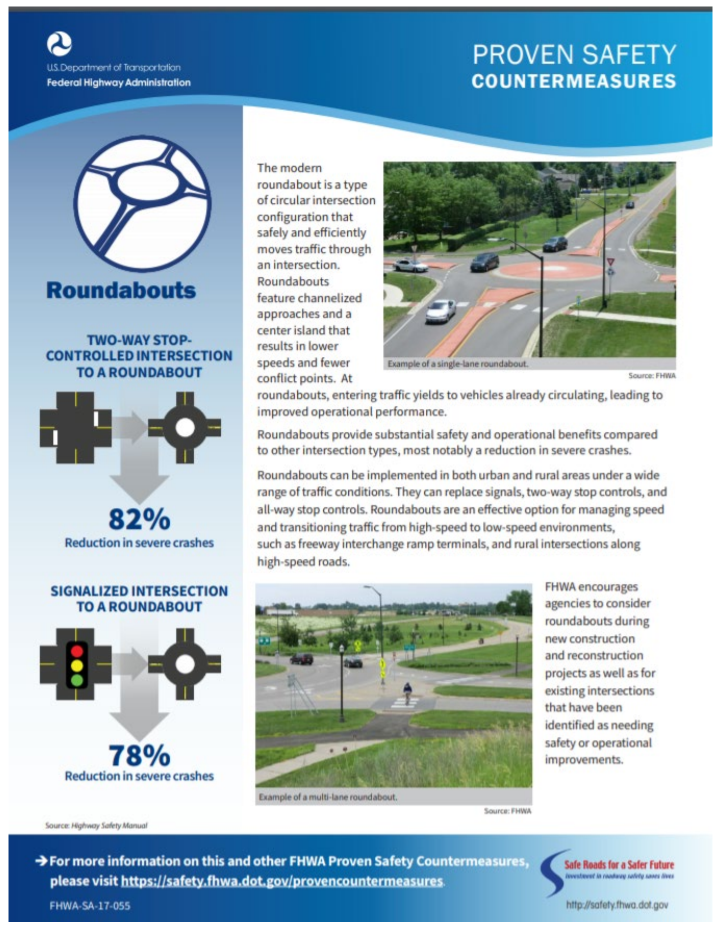
Source: Highway Safety Manual

Use of roundabouts, raised median, and right-in/right-out driveways can be an effective access management plan.
Source: FHWA-SA-15-005

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures.

FHWA-SA-17-052

Safe Roads for a Safer Future
http://safety.fhwa.dot.gov


U.S. Department of Transportation
Federal Highway Administration

PROVEN SAFETY COUNTERMEASURES

Roundabouts

The modern roundabout is a type of circular intersection configuration that safely and efficiently moves traffic through an intersection. Roundabouts feature channelized approaches and a center island that results in lower speeds and fewer conflict points. At roundabouts, entering traffic yields to vehicles already circulating, leading to improved operational performance.

Example of a single-lane roundabout.
Source: FHWA

Roundabouts provide substantial safety and operational benefits compared to other intersection types, most notably a reduction in severe crashes.

Roundabouts can be implemented in both urban and rural areas under a wide range of traffic conditions. They can replace signals, two-way stop controls, and all-way stop controls. Roundabouts are an effective option for managing speed and transitioning traffic from high-speed to low-speed environments, such as freeway interchange ramp terminals, and rural intersections along high-speed roads.

FHWA encourages agencies to consider roundabouts during new construction and reconstruction projects as well as for existing intersections that have been identified as needing safety or operational improvements.

Example of a multi-lane roundabout.
Source: FHWA

TWO-WAY STOP-CONTROLLED INTERSECTION TO A ROUNDABOUT

82%
Reduction in severe crashes

SIGNALIZED INTERSECTION TO A ROUNDABOUT

78%
Reduction in severe crashes

Source: Highway Safety Manual

→ For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures.

FHWA-SA-17-055

Safe Roads for a Safer Future
http://safety.fhwa.dot.gov

I-49 IMPROVEMENTS

In summer 2002, the NWARPC requested that the ArDOT undertake a study of future capacity needs for the I-49 corridor through Washington and Benton Counties. In September 2003, Parsons Transportation Group was selected to perform the Study and it was completed in April 2006.

Interstate 49 is the transportation spine of the Northwest Arkansas region. Due to the rapid growth that is occurring in the region, traffic volumes have grown to levels that are producing urban traffic congestion. The commercial growth of the region has gravitated to the interchanges on I-49, resulting in queues that back up on Interstate ramps to such an extent that they occasionally interfere with Interstate operations. This Study considered Interstate widening, and focused on a study of nineteen interchanges, to recommend short-term, interim and long-term improvements.

The Study examined crash data and found some segments of the Interstate that exceed statewide average crash rates. The crash rates for the cross-roads that are state highways were also considered. Crash rates for these were uniformly very high, but this is seen as indicative of the urban congestion in the vicinity of the interchanges, which are not typical of the data used to develop the statewide crash rates for thesefacilities.

The Study examined anticipated traffic flow conditions for the year 2024, and found that severe deficiencies can be expected. Freeway and ramp junction conditions were reviewed. Also, the cross-street at each of the 19 interchanges was examined for anticipated traffic flow conditions.

The recommendations in the Study provided the basis for allocating estimated funding resources in past plans and helped guide the CAP and GARVEE Bond planned projects that were ultimately programmed in the TIP. Projects programmed in the TIP include:

JOB #	FFY	TERMINI
040846	2023	Hwy. 62 Intchng. Impvts. (Fayetteville)

NWARPC Supported DOT Performance Targets: Truck Travel Time Reliability, Travel Time Reliability, Number and Rate of Serious Injury and Fatal Crashes, and Pavement Condition.

US 612 (412 NORTHERN BYPASS) (NHS)

The FHWA issued a Record of Decision on February 15, 2006 that approved a Selected Alignment Alternative for the proposed bypass. This project is considered an essential east-west corridor improvement to the highway system in the MPA. While not fully funded in the Constrained List, the project is still considered one of the top priorities in the area.

In 2012, the CAP program was approved by Arkansas voters and included funding for the segment between I-49 and Highway 112 including one-half of the I-49/Highway 412 interchange. The contract was awarded in December 2014 and groundbreaking was held in April 2015 on the $100 million, 4.57-mile segment. A ribbon cutting ceremony opening the facility occurred on April 18, 2018.

The project has and will continue to improve reliability and safety for freight and commuters by providing a four- lane fully controlled access freeway through the urbanized area and reliving traffic congestion and improving safety on the existing US 412 through Springdale.

US 412 Projects programmed in the TIP include:

JOB #	FFY	TERMINI
012326	2023	Hwy. 412 - Hwy.112 (Springdale Bypass) (S)

NWARPC Supported DOT Performance Targets: Truck Travel Time Reliability, Travel Time Reliability, Number and Rate of Serious Injury and Fatal Crashes, and Pavement Condition.