

# CHAPTER 4: SYSTEM MANAGEMENT

Chapters 2 and 3 described the growing demands being placed upon the transportation system and how the existing system is currently serving Central Ohio travelers. Looking to the future, most important is ensuring the existing system is maintained and operated as efficiently as possible.

This chapter focuses on preserving and managing the existing transportation systems. The MTP strategies and projects in this chapter focus on keeping the existing system in a state of good repair, managing the system through the use of technology and innovation, and making the system as safe and secure as possible.

## **4.a SYSTEM PRESERVATION & MAINTENANCE**

Activities focused on preserving, maintaining, and operating the transportation system are an important component of the MTP. The most recent federal legislation, Fixing America’s Surface Transportation, or FAST Act, places emphasis on system preservation and maintenance. This includes projects related to operation of the transportation system (e.g., plowing, mowing, painting, and traffic control), bridge replacement/rehabilitation, road resurfacing and reconstruction.

Spending on preservation, maintenance, and operations makes up the largest single category of what the region spends on the transportation system. Even as the needs of the MPO planning area continue to grow, there is a limit to how many resources can be directed toward building new facilities. The existing system needs to be maintained and operated efficiently to ensure the health, safety, and welfare of the region.

While operations, maintenance, and system preservation in aggregate are significant, the individual projects are often so small they seem regionally trivial. Consequently, the MTP does not individually identify these types of projects.

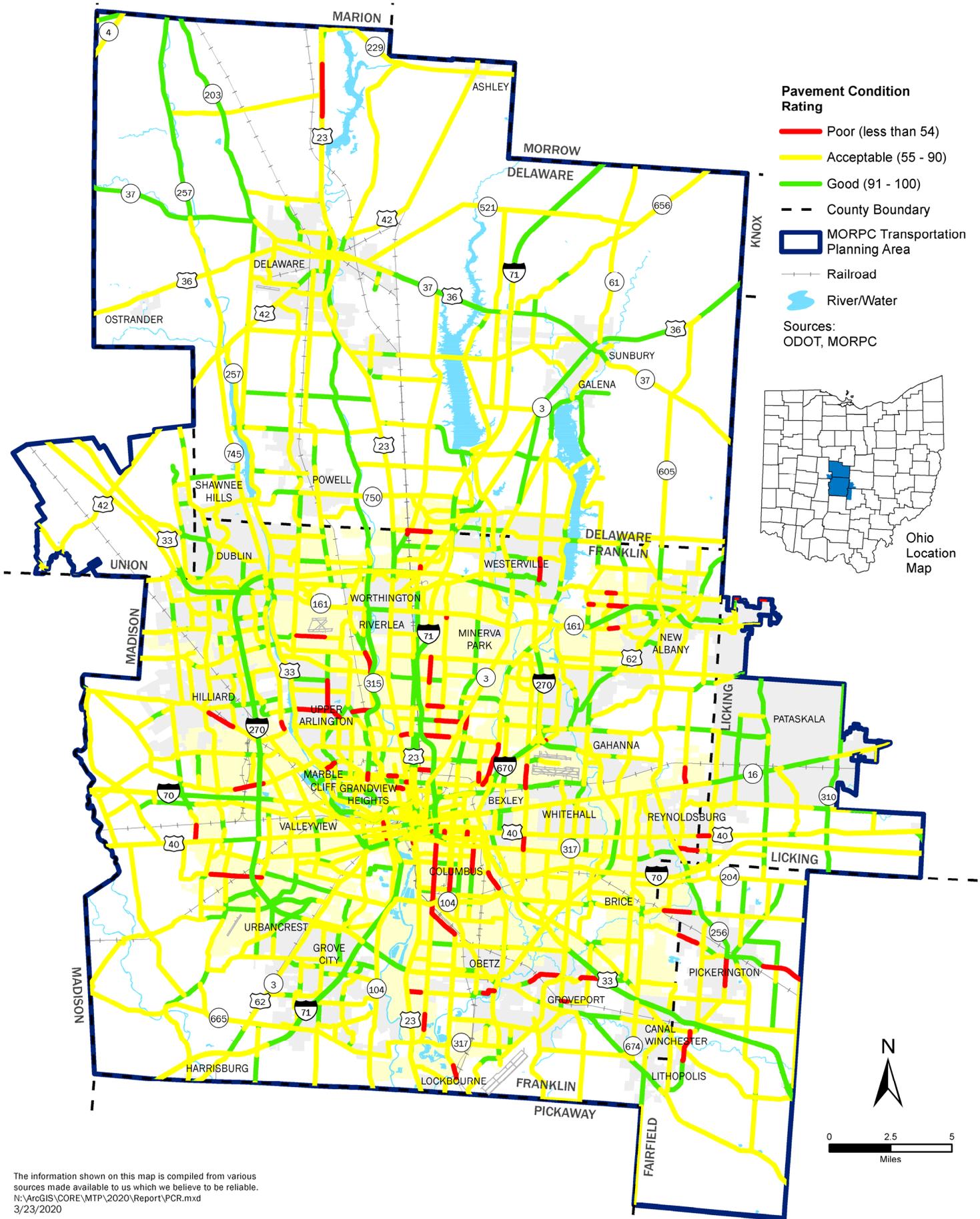
Historically, Ohio has provided adequate resources to preserve and maintain its roads and bridges. Significant portions of federal, state, and local budgets fund system preservation and maintenance activities. Often funding used on regional system expansion projects, such as those identified throughout the MTP, address system preservation through the rehabilitation of existing facilities when adding capacity.

MORPC has worked with many local governments to gather the information necessary to estimate future spending. Spending on maintenance and operations comes in no standardized or detailed form. For example, some activities are obscured in general operating budgets. Consequently, without better information, the MTP assumes adequate funding for operations, maintenance, and preservation, as described in the Preservation and Maintenance Strategies section of this chapter.

### **SYSTEM MANAGEMENT ACTIVITIES**

As part of its Transportation Information Management System, ODOT collects pavement condition rating (PCR) data, which uniformly measure conditions on roadways classified as collector and above in Central Ohio, as shown in Figure 4.1.

Additionally, the federal performance management procedures require the pavement conditions of National Highway System (NHS) be monitored and reported. As part of this process, MORPC reports the pavement conditions for various levels or subsystem of the roadways, including NHS and non-NHS to have an understanding of the condition of the comprehensive system. Table 4.1 shows what portion of each subsystem currently meets the acceptable PCR criteria and the corresponding 2050 targets.



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**Figure 4.1**  
**Pavement Condition Ratings**

**Table 4.1**  
***Pavement Condition Ratings***

<b>Pavement Subsystem</b>	<b>Percent in Good Condition (2020)</b>	<b>MTP Target for Good Condition</b>	<b>Percent in Poor Condition (2020)</b>	<b>MTP Target for Poor Condition</b>
<b>Interstate System</b>	<b>60%</b>	<b>&gt; 50%</b>	<b>0.1%</b>	<b>&lt; 1%</b>
<b>Non-Interstate NHS</b>	<b>41%</b>	<b>&gt; 35%</b>	<b>1.3%</b>	<b>&lt; 1%</b>
<b>Federal-aid Non-NHS</b>	<b>71%</b>	<b>&gt; 50%</b>	<b>4%</b>	<b>&lt; 5%</b>

Ohio law requires an annual inspection for all bridges. This law applies to all bridges in the state, regardless of who owns them. In general, bridge conditions change slowly. Dramatic, year-to-year fluctuations are rare.

Similar to PCR, the federal performance management process also includes bridge condition measures on NHS bridges, and monitors those in good condition and poor condition, expressed as percentage of deck area. The current condition of bridges within the planning area are shown in Figure 4.2. The MTP sets a 2050 targets for bridges carrying the NHS system, and bridges carrying non-NHS facilities.

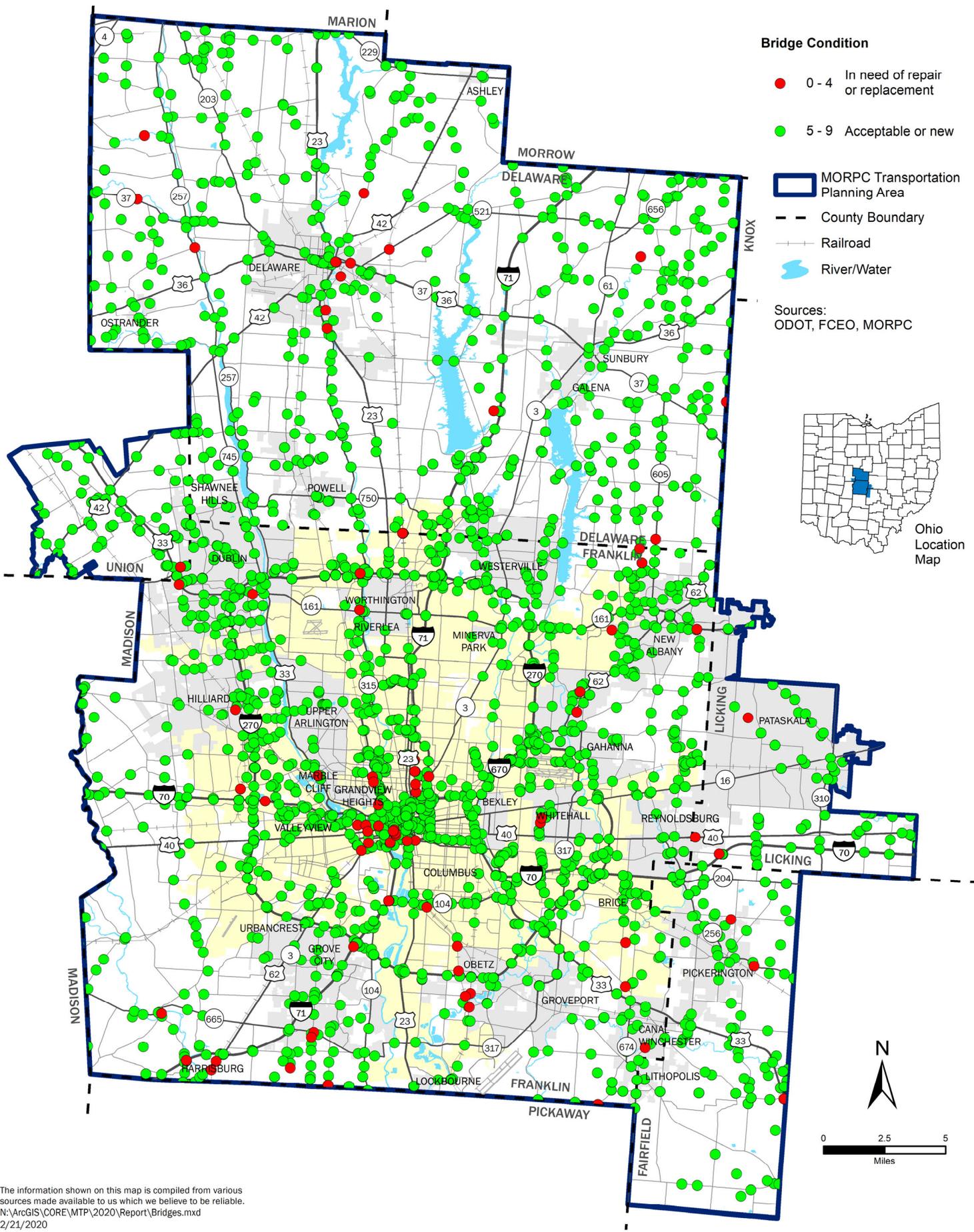
### **PHYSICAL PRESERVATION STRATEGIES AND PROJECTS**

As the owner of the most important roadways, ODOT is committed to building upon the tradition of preserving, maintaining, and modernizing one of the most well-regarded transportation systems in the nation. ODOT promotes “Fix it First” programs. “Fix it First” includes ODOT’s Transportation Asset Management Plan, which emphasizes making steady, systematic improvements rather than waiting to make repairs until the asset needs major reconstruction. “Fix it First” also includes the Pavement & Bridge Preservation Program. The local jurisdictions, responsible for maintaining the remainder of the system, take a similar approach of allocating significant portions of their transportation funding to maintaining the system.

Strategies presented throughout the MTP may help preserve and maintain the transportation system. Strategies and projects to expand the system will also improve the condition of the system. However, the following strategies and projects specifically address system preservation and maintenance.

- 1. Repair or replace bridges in poor physical condition**
- 2. Repave or reconstruct roads in poor physical condition**
- 3. Repave or reconstruct sidewalks and bikeways in poor physical condition**

State and local officials are encouraged to employ cost-effective preservation strategies and to optimize every dollar spent. It is important to develop training for low-cost, long-term treatment strategies, forecasting for program budgets and optimization of expenditures. A number of programs at the state level focus on maintaining the existing system. These include:



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**Figure 4.2**  
**Bridge Ratings**

## District Pavement & Bridge Preservation Program

Provides funding for the preservation and rehabilitation of the Priority, Urban and General System pavements and the state-maintained bridge structures.

The goal is to maintain pavements and bridges at “steady state” conditions, or a relatively low and stable level of deficiencies where a predictable rate of preventive maintenance and regular repairs can efficiently sustain the system conditions.

## ODOT Major Bridge Program

- Provides a source of funds separate from each ODOT district’s bridge allocation.
- For high-cost bridge rehabilitation and replacement, typically projects over one million dollars.

## Multi-Lane Major Rehab Program

- Focuses on almost 3,000 miles of multi-lane roadways in the state.

## County Bridge Program

- Provides funds to counties for bridge replacement or rehabilitation.
- The County Engineers Association of Ohio (CEAO) serves as the program manager and is responsible for project selection, funding criteria and program priorities.

## Local Major Bridge Program

- Provides funds to counties and municipalities for bridge replacement or major bridge rehabilitation projects that have County Maintenance Responsibility.

## Municipal Bridge

- Provides funds to municipalities for bridge replacement or rehabilitation.

## ODOT Bridge Partnership Program

- Funds eligible bridges with 100% federal dollars and requires no local match.
- Reduces inventory of structurally deficient county and municipal bridges across the state.

## Urban Paving Program

- Provides funds for eligible surface treatment and resurfacing projects on state and U.S. routes within municipal corporations.

## State Capital Improvement Program (SCIP)

- Administered by the Ohio Public Works Commission (OPWC).
- Funds road, bridge, water, storm, and sanitary sewers.
- Carries a statutory requirement for districts to give priority to projects that repair or replace existing infrastructure.
- OPWC also administers the Local Transportation Improvement Program (LTIP). LTIP is

available only for road and bridge projects.

#### Local Capital Improvement Programs

- Document spending in local government operating budgets.

#### **4. Replace transit vehicles that are beyond their useful life**

#### **5. Repair or replace transit facilities in poor physical condition**

#### FTA Section 5339 Bus and Bus-Related discretionary and formula grants

- Can be used to purchase buses and bus-related assets.

#### CMAQ-M

- At ODOT's discretion, MORPC has had a certain amount of CMAQ funds available. These are typically used for transit bus replacements, intersection improvements, minor arterial widening projects, travel demand management programs and air quality awareness programs.

#### **6. Utilize advanced material and techniques to maximize life of transportation system components**

##### Every Day Counts

Ohio's contribution to the Every Day Counts - Regional Models of Cooperation initiative highlights 11 examples of collaborative, multijurisdictional planning processes currently occurring within the state. MORPC tracks projects completed utilizing this initiative through the regional performance measures (refer to Chapters 1 and 9).

##### ODOT's Research Initiative for Locals (ORIL)

Ohio's research program for local public agencies. The purpose of ORIL is to provide research support for local agencies to address problems specific to the local roadway system.

#### **7. Continue to evolve consistent data collection and analysis procedures to rate the physical condition of the transportation system components**

Although ODOT collects data on the majority of the most important roadways, there are data gaps. When it comes to the local agencies, how they collect transportation data differs greatly. Such disparity impedes having a complete and accurate set of regional data. In order to standardize such processes, local governments are encouraged to account for their road and bridge infrastructure network using the "modified approach" permitted by the General Accounting Standards Board (GASB) when completing their Comprehensive Annual Financial Report (CAFR).

The asset management system would have to provide an up-to-date inventory of the infrastructure. It also must perform a condition assessment of the network at least every three years. It must estimate the annual amount each year required to maintain and preserve the asset network at the established minimum condition level. Using this methodology, only the costs of network additions and capacity

improvements are capitalized.

MORPC has worked to create and maintain a uniform Location-Based Response System (LBRS) roadway centerline and Sidewalk Inventory Geographic Information System (GIS) files. MORPC is working on a web interface that will allow other jurisdictions to submit changes to the file. Such a system could help collect and organize consistent condition data.

### Paving the Way

This program, funded by MORPC, collects and disseminates upcoming construction project information throughout the region.

## **PHYSICAL PRESERVATION THROUGH 2050**

**MORPC estimates approximately \$7.7 billion in federal, state, and local funds will be expended through 2050 to preserve the transportation system in the MPO planning area. Section 7.2 has detailed information about the financial forecast for the MPO planning area. As listed above, a number of agencies provide federal, state, and local funding to address the maintenance and preservation of the existing transportation system in the region. Depending on the agency, the programs address separate, but sometimes overlapping, portions of the transportation system.**

## 4.b INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent transportation systems (ITS) is a “system of systems,” envisioned to evolve using communication technologies and real-time coordination to allow for more effective operations/use of the transportation system without adding pavement. ITS refers to an assortment of technologies, systems, and transportation management concepts. ITS plays a key role in a safe, efficient, and innovative transportation system for all travelers. A key aspect of ITS is providing information to travelers because when travelers know traffic conditions in real-time, they can make more informed travel decisions. Examples of ITS technologies include coordinated signal systems, dynamic message signs, portable changeable message signs, ramp meter signals on freeways, CCTV traffic cameras that monitor traffic flow and incidents, connected and autonomous vehicles, and transit-related systems such as the Automated Vehicle Locator (AVL), which helps determine the real-time location of public fleet vehicles.

ITS enables collaboration, communication and cross-jurisdiction/agency system integration. ITS is a proven solution to reduce congestion, increase traffic flow, enhance safety and improve air quality. It is imperative to create one transportation system that works across jurisdictions and agencies and utilizes limited resources most efficiently.

Terminology often heard today is the word "Smart." This is under the umbrella of ITS and generally refers to more advanced technology enabling more real time data available about the transportation system to the public, communication of information between vehicles and the transportation infrastructure, and more advanced algorithms to use that data to better manage the system including autonomous vehicles.

### BACKGROUND

FHWA developed the national ITS architecture to provide a unifying framework for ITS infrastructure deployment. As the MPO for the region, MORPC houses and maintains the regional ITS architecture. ITS has been and will continue to be an integral part of transportation planning in Central Ohio.

The Central Ohio Regional ITS Architecture is available online at: <http://morpc.org/itsArchitecture/>. The website

### SMART STREETS POLICY

#### Background:

Technology is rapidly changing transportation infrastructure

#### Purpose:

Ensure investment in public infrastructure advances a “smart region”

#### Vision:

- Connected
- Inclusive
- Secure
- Resilient
- Improved Quality of Life

MORPC approved a Smart Streets Policy that leverages current and emerging technologies and data to provide a digital infrastructure network. Digital connectivity and data are fundamental to delivering an efficient and complete connection of streets that will improve the quality of life of Central Ohio residents.

The policy seeks to incorporate the Smart Streets concept into the planning, programming, scoping, design, implementation, maintenance, and performance monitoring of all transportation infrastructure projects awarded funding through MORPC. It further recognizes that while future technology is unknown, communities need to be flexible and prepared for the next evolving technology. The policy also includes recommendations for communities to adopt their own Smart Streets Policy.

displays all existing and planned systems and demonstrates the information flow between them. The regional ITS architecture serves as a tool to educate both professionals and the public of the importance of ITS and information exchange. The architecture ensures that institutional agreements and technical integration for the implementation of ITS projects are in place. Its primary goal is to facilitate the efficient deployment and use of ITS equipment, networks and management structures to create a safer and more efficient transportation system across jurisdictions. All ITS projects using federal funding must conform to the Regional ITS Architecture.

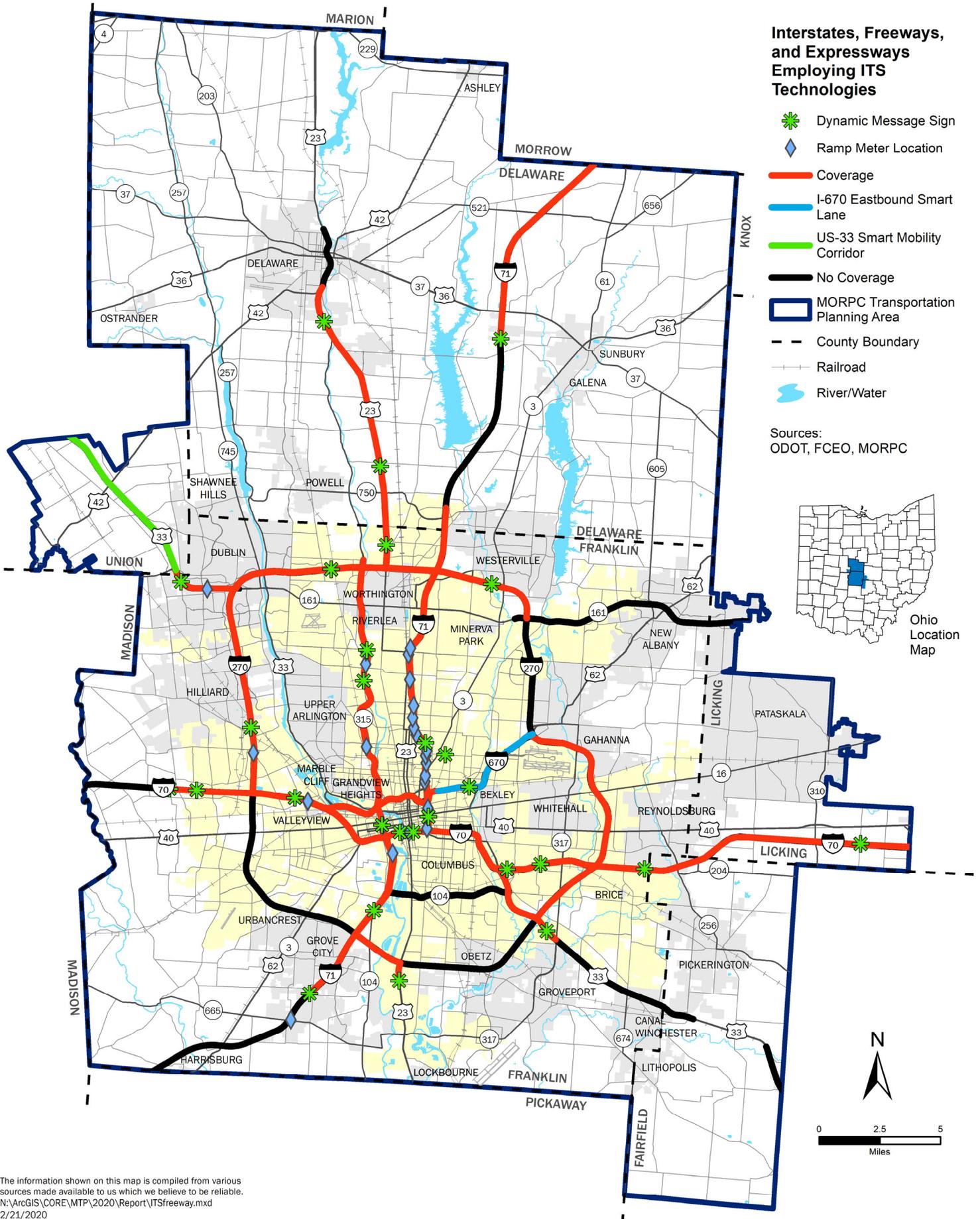
## THE SYSTEM TODAY

There are two ways MORPC looks at the extent of the ITS system. First is to inventory how many of the roadways classified as minor arterial and above employ ITS to coordinate signals, utilize ramp meters or message signs, all of which optimize the traffic flow. Second is to inventory how many of the principal arterials and above have coverage by video surveillance to monitor and respond to incidents or other changing travel conditions.

The extent of the ITS coverage is shown in Figures 4.3 and 4.4. These corridors are regionally significant because they accommodate a high volume of through traffic. The MTP sets a target to have 90% of functionally classified Principal Arterials and above utilizing coordinated ITS technologies by 2050. The City of Columbus continues to talk to neighboring jurisdictions about opportunities to connect their signals to the regional system. MORPC will continue to work with its member jurisdictions and through the Columbus Traffic Signal System update to establish multi-jurisdictional partnerships.

In 2016 the USDOT awarded the City of Columbus \$40 million to demonstrate how advanced data and intelligent transportation systems (ITS) technologies and applications can be used to reduce congestion, promote safety, protect the environment, respond to climate change, connect underserved communities, and support economic vitality. The City of Columbus is utilizing these funds to:

- Develop a connected vehicle environment and self-driving shuttles
- Enhance mobility services through technology with
  - ◆ Multimodal Trip Planning Application and Common Payment System
  - ◆ Smart Mobility Hubs
  - ◆ Mobility Assistance for People with Cognitive Disabilities
  - ◆ Prenatal Trip Assistance
  - ◆ Event Parking Management
- Accelerate electric vehicle (EV) adoption to become one of the leading EV markets in the U.S.



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**Figure 4.3**  
*Interstates, Freeways & Expressways Employing ITS Technologies*



## ITS STRATEGIES AND PROJECTS

Along with continued deployment of existing ITS technologies, new ITS technology, such as autonomous and connected vehicles, has the potential to significantly alter the demands placed on the region's transportation system. Since opportunities for system integration and operational coordination extend beyond jurisdictional boundaries, it is important to have collaboration in planning for both system and inter-jurisdictional integration. MORPC will continue to work with its stakeholders to implement the following strategies and projects:

### **1. Collect, develop, and maintain data on roadway, transit, bike and pedestrian conditions and other modes and share the data and information through technology.**

MORPC will continue to monitor development in transportation system management and operations and evolving transportation technologies in order to improve traffic flow in our region. New technologies are being investigated at federal, state, and regional levels.

MORPC fosters system integration and agency cooperation concerning ITS technologies. Working together across agencies and jurisdictions is important in order to reduce overall costs by combining and sharing resources and information.

#### ODOT Statewide Traffic Management Center (TMC)

The ODOT Statewide TMC operates the traffic management and traveler information system on Ohio's interstates, freeways, expressways, and state highways. The mission of the TMC is to increase transportation safety, reduce congestion, and increase efficiency on Ohio's state highways. The Statewide Traffic Management Center is located at ODOT's Central Office. The TMC has dedicated operators who monitor traffic in each major metropolitan area across the state including Akron/Canton, Cincinnati/Northern KY, Cleveland, Columbus, Dayton/Springfield, and Toledo. The operators can control cameras, post messages to DMS, HAR, and the Buckeye Traffic website, etc. The operators are monitoring more than 500 traffic cameras around the state in all the major metro areas and also a couple in the more rural areas.

#### SmartColumbus

At the center of the SmartColumbus portfolio of projects is the Smart Columbus Operating System, an integrated, holistic integrated data exchange where data is collected, aggregated, published and used to power these solutions. The operating system serves as the data “backbone” for the projects, serving to collect and transmit data about the projects, and to capture performance data reported to the USDOT and the public.

### **2. Broaden the existing transportation system managed in a coordinated manner through Intelligent Transportation System technologies**

Since funding is limited, the region must prioritize ITS projects based on the over-all need and the ability to integrate them with other projects to maximize regional value.

#### Columbus Traffic Signal System (CTSS)

The City of Columbus' Computerized Traffic Signal System is a significant ITS system in the Central Ohio region. Established in the 1980s, the system has control of nearly 1,000 intersections in Columbus and surrounding areas and is considered a backbone for the region's ITS network due to its size and the investment that has been made. The city is implementing a multiphase project to create a modern, open-architecture, computerized traffic signal system and communications network. The work includes new central control system hardware and software, as well as fiber optic and wireless communications

infrastructure. Columbus has contacted neighboring jurisdictions to better understand their signal plans and to see if there are opportunities to connect their signals to the regional system.

### US 33 Smart Corridor

MORPC and respective local and regional planning partners started to move the US 33 Intelligent Corridor (US 33 from Marysville to Dublin) project forward in 2016. The US 33 corridor uniquely ties the physical assets of the Transportation Research Center (TRC) and many companies along the corridor to the abundance of physical and intelligence assets available at The Ohio State University. The intelligent corridor project includes the installation of next generation ITS. Improvements may include fiber-optic extensions in the public right-of-way, dedicated short-range communication technology (DSRC) fixtures, and enhanced cellular infrastructure to allow for the deployment of test-bed connected vehicles, or partial autonomous vehicles.

### Central Ohio ITS Committee

MORPC reinitiated the ITS Committee for the Central Ohio region in January 2014. The Central Ohio ITS Committee will allow for collaboration and coordination between various stakeholders on regional traffic operations investments and practices in the Central Ohio region. Its main purpose is to coordinate ITS activities in Central Ohio and assist MORPC in maintaining and updating the regional ITS architecture and ensuring compliance with it.

### Regional ITS Architecture

In 2015, MORPC completed the fourth update to the Regional ITS Architecture. MORPC utilized Turbo Architecture v7.0 to generate more detailed listings of system inventory and system interconnections. MORPC continually keeps the ITS architecture up to date (as opposed to periodic major updates).

The ITS Architecture identifies all entities (device types) and how they interface among agencies. The regional ITS architecture should be used to verify that all ITS projects fall in line with the existing structure. If the project includes a new interface that isn't already identified within a stakeholder's inventory, then the stakeholder should reference the ODOT Traffic Engineering Manual (TEM), Part 1301-2, to identify the required steps that need to be taken to qualify for ITS funding. It is in the best interest of the project stakeholders to keep the ITS architecture updated, by communicating any changes to ODOT and MORPC.

### Transportation Improvement Program (TIP)

The Transportation Improvement Program (TIP) lists the various ITS projects with allocated funding. All ITS projects using federal funding in Central Ohio must conform to the Regional ITS Architecture and be included on the TIP.

## **3. Implement managed lanes along additional freeway corridors**

### ODOT Active Traffic & Demand Management (ATDM) Study

At the state level, ODOT's ATDM study examined potential pilot programs for the Central Ohio area and other regions in the state to improve travel time reliability, reduce vehicle delays and improve safety through the utilization of strategies other than typical highway expansion projects. ATDM is the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities. ATDM strategies can provide significant capacity benefits at a fraction of the cost to build traditional capacity projects. Some examples of ATDM are Ramp Metering, Hard Shoulder Running (HSR), Variable Speed Limits, and Dynamic Lane Assignment. In 2019, ODOT implemented HSR and variable speed limits on eastbound I-670 between 4th St. and I-270 (east outerbelt). Three additional

corridors are identified in the MTP for ATDM strategy by 2050.

#### **4. Apply access management along arterial and collector corridors**

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. The benefits of access management include improved movement of traffic flow, reduced crashes, and fewer vehicle conflicts. Access management projects are identified in this MTP on US-23 between the Franklin/Delaware County line and the City of Delaware, and on US-36/SR-37 between City of Delaware and I-71.

#### **5. Improve connections and coordination among transit system operators**

MORPC meets quarterly with COTA, DCT and LCT to discuss service changes, current and future connections. Relationships have been established in the region to develop solutions with local governments, transit systems, and employers. Work continues to explore locations, policies and funding to connect outside of typical service areas.

#### **6. Expand transit signal priority along additional roadway corridors**

MORPC works with local jurisdictions and transit service providers on signal project development to identify transit priority needs. As high capacity transit develops in the region, signal priority can be incorporated in the project scope.

#### **7. Improve demand response transit service**

##### COTA Mainstream

COTA Mainstream is a shared-ride public transportation service providing origin-to-destination transportation for people whose functional limitations prevent them from riding COTA's fixed-route buses for some or all of their trips.

##### Transit Tech Ohio

ODOT received a \$6.8 million TIGER VII Discretionary Grant to help rural transit agencies purchase hardware, software and improve broadband access that will allow them to schedule and dispatch transit vehicles. Vehicles will be equipped with GPS, automatic vehicle location systems, tablets, and mobile data terminals. These upgrades will promote the ability for multiple agencies to share services. In MOPRC's planning area the Lancaster Public Transit System will benefit from this grant.

##### 5310 Apportionment

Due to MAP-21 provisions, during FFY 2015, Columbus began receiving apportionments to administer Section 5310 funds. MORPC was declared a Designated Recipient on October 9, 2014. Under the FASTAct MORPC will continue to administer this program according to its FTA-approved Program Management Plan.

#### **8. Manage, improve and coordinate human service, private and public transportation, to better meet the needs and fill the gaps**

Based on the needs and gaps identified in MOPRC's 2018 Coordinated Plan for Delaware and Franklin counties, MORPC administers FTA 5310 funding in the Columbus area to manage, improve, and coordinate transportation with capital and operating projects.

##### Mobility Management

In 2020 MORPC began a mobility management function to further support and enhance the coordination

of mobility services. MORPC's Mobility Manager works to coordinate programs among public, private, and non-profit transportation providers with regional mobility managers that serve older adults, people with disabilities and individuals with lower incomes. Mobility Management will focus on ongoing mobility service and planning efforts throughout the region. MORPC engages stakeholders on best practices to address gaps and needs to increase transportation capacity. Facilitate the development of technology that coordinates inventoried transportation systems with mode eligibility and trip arrangement for users. Staff also incorporates urban and rural barriers that lead to mobility challenges. MORPC will work with existing mobility managers in the MORPC MPO area, Licking County, the Central Ohio Rural Planning Organization (CORPO) counties, ODOT's Human Service Transportation Coordination Regions (HSTCR) 5 and 6 and ODOT's Office of Transit for a more regional multi county approach to update the next Coordinated Plan. There will be an initial focus on the MORPC MPO area that will evolve into a more regional approach as ODOT oversees Coordinated Plans around Human Service Transportation Coordination Regions

## **9. Implement vehicle to infrastructure and vehicle to vehicle communications**

### DriveOhio

DriveOhio is the state's new center for smart mobility, and serving as the hub for all things autonomous and connected in Ohio.

Supported by the Ohio Department of Transportation, DriveOhio also works to ensure Ohio's regulatory environment and public policies are conducive to the development of the infrastructure and technologies needed for smart mobility.

As the single point of contact for all of Ohio's smart mobility initiatives and advancements, DriveOhio fosters cooperation and collaboration, offers faster access to resources by breaking down government barriers, and improves efficiencies for people and organizations that want to be part of this industry.

### SmartColumbus

One of SmartColumbus' goals is to use self-driving vehicle technology to help close gaps in transportation access in the city. In partnership with DriveOhio, SmartColumbus launched Smart Circuit, Ohio's first self-driving shuttle, in December 2018. Smart Circuit circled the Scioto Mile in downtown Columbus, providing free rides to the Center of Science and Industry (COSI), the National Veterans Memorial and Museum, Bicentennial Park and the Smart Columbus Experience Center. The shuttle then moved to the Linden neighborhood serving a route that will help to solve "first-mile / last-mile" mobility challenges in the neighborhood by providing free rides between key neighborhood destinations.

SmartColumbus is planning to launch a connected vehicle environment in July 2020 along High St. and Cleveland Ave., north of 5th Ave. and from Morse Rd., east of High St. to Steltzer Rd., including intersections with the highest collision rates in the city.

During this pilot program, devices called "on-board units" will be installed on public and private vehicles to allow vehicles to talk to each other and receive in-car alerts like blind spot detection or rear end collision warning. The on-board units also allow vehicles to talk to traffic signals and other roadway infrastructure to provide in-car alerts like red light violation warning. The alerts will give drivers advanced warning of potential hazards or safety concerns so they can slow down or take other precautionary measures. Traffic managers will be able to adjust traffic light timing and mobilize other responses like snow and salt trucks based on real-time information on road conditions relayed by the units. Traffic lights will give priority to connected COTA buses, which will help keep them running on time. Emergency vehicles will also get the green light, allowing them to get through intersections more safely and quickly.

**9. Modify lane configurations of roadways, where appropriate, to safely match vehicle, transit, bike and pedestrian demand**

**10. Implement curbside management to facilitate package delivery and mobility as a service pick-up and drop-off while minimizing impact on transportation system operations**

The curb space is where the various transportation systems merge. Pedestrians, bicycle storage, passenger drop-offs, deliveries, and parked cars all utilize the curbside. There are opportunities to incorporate curbside management policies into Active Transportation Plans, Complete Streets Policies, and other policy tools at the regional and local level.

**12. Facilitate multi-jurisdictional dialogue to improve opportunities for collaboration**

## **4.c TRANSPORTATION SAFETY**

Between 2013 and 2017, 176,060 individuals lost their lives as a result of motor vehicle crashes occurring within the United States. This translates to someone being killed on average every 15 minutes on our nation's roadways, or around 96 deaths every day. Traffic collisions are consistently ranked among the five leading causes of death within both the United States and the State of Ohio and represent a major public health concern globally. Central Ohio is not immune to these issues. The MPO planning area had 196,792 crashes reported between 2013 and 2017 that involved nearly half a million people (498,131). Of these individuals, 528 lost their lives and another 71,931 were injured, with 4,323 suffering incapacitating (life-changing) injuries. Aside from the devastating human impact caused by these crashes, the economic impact is staggering - around \$10 billion dollars in associated loss observed annually for the State of Ohio.

While it's not likely these transportation safety issues will be resolved tomorrow, nationally, reductions in the number of fatalities and serious injuries have been realized over the last few decades. Traffic deaths and serious injuries are preventable and transportation safety needs to be continuously prioritized as investments are being made in our transportation system. By doing this, not only will past improvements be sustained, but further reductions in fatal and serious injuries will be observed, with the ultimate goal of achieving zero deaths on the regional transportation system.

### **LEGISLATIVE BACKGROUND**

In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP), structured and funded to make significant progress in reducing the occurrence of fatalities and serious injuries on all public roadways. It stressed a data-driven, strategic approach to improving highway safety and nearly doubled the funds allocated for safety-related infrastructure projects. With its focus on performance, SAFETEA-LU also required states to develop a Strategic Highway Safety Plan (SHSP).

In 2012, The Moving Ahead for Progress in the 21st Century Act (MAP-21) continued the primary features of HSIP, including the requirement for a comprehensive, data-driven, approach to transportation safety that is intended to underlay any defined goals and strategies. MAP-21 further required MPOs, like MORPC, to coordinate with state departments of transportation on setting a minimum of four safety performance targets for the region: number of fatalities, number of serious injuries, fatality rate and serious injury rate.

Like its recent predecessors, the Fixing America's Surface Transportation (FAST) Act continues the tradition of providing a data-driven framework for reducing fatalities and serious injuries and maintained current funding levels of HSIP.

With the passage of the SAFETEA-LU, MORPC began to engage more directly in activities surrounding the improvement of transportation safety within the Columbus region. This resulted in the creation of a dedicated Transportation Safety Program in 2006. Today, transportation safety is among the top priorities at both the state and regional levels and continues to see significant attention and funding. MORPC's Transportation Safety Program is based on a model of cooperation within the State of Ohio and aims to deliver the resources and information our partners need to create a safer region. MORPC works closely with the Ohio Department of Transportation in its development and implementation of the Ohio Strategic Highway Safety Plan (SHSP) and released a regional plan, the Central Ohio

Transportation Safety Plan, in 2019 to focus on strategies for improving safety on locally-maintained roadways.

## **SAFETY STRATEGIES AND PROJECTS**

In order to improve safety and realize efficiencies, collaboration and resource sharing are required. This involves bringing various agencies to the table, including law enforcement, emergency responders, state transportation officials, local transportation officials, political leaders, and the public. As a result, MORPC's approach to safety planning involves substantial collaboration and is multi-jurisdictional in nature. And while strategies presented throughout the MTP involve collaborating with stakeholders to indirectly improve transportation safety, MORPC will continue to seek opportunities to work with member agencies and other partners to implement the following strategies and projects that deal directly with the safety of Central Ohio's transportation system.

While the strategies discussed below deal with safety directly, another effective strategy is to promote the use of alternatives to motorized travel. Greater use of alternative modes along with other strategies that reduce motorized travel would reduce the overall amount of vehicle miles traveled. This, in turn, would result in fewer crashes and fatalities. Chapter 6 includes many activities that further this strategy. Chapter 5 focuses on all opportunities to reduce single-occupancy vehicle travel.

### **1. Collect, develop, maintain, and analyze crash data and identify regional safety emphasis areas and priority safety locations.**

MORPC stresses a data-driven, strategic approach to improving highway safety and making informed investment decisions. The data generated through motor vehicle crash reporting are fundamental aspects of any program seeking to reduce the number of fatalities and serious injuries resulting from these crashes. MORPC will continue to work both locally and statewide to pursue investments in the accuracy and timeliness of regional crash data and ensure relevant crash data and information are available and useable by all of our partners.

#### Participate in the Strategic Highway Safety Plan (SHSP) Steering Committee

MORPC, serving as a representative for the Ohio Association of Regional Councils, is one of several stakeholders involved in the SHSP Steering Committee. This statewide committee brings together relevant federal, state, regional, and local agencies to support implementation of the plan and track progress toward the established goals. The committee meets quarterly to discuss ongoing efforts to reduce fatalities and serious injuries and to review crash trends. The committee will also be assisting with the 2020 update to the SHSP that will inform safety priorities for the state over the next five years.

#### Central Ohio Transportation Safety Plan

The Central Ohio Transportation Safety Plan (COTSP) is a comprehensive safety plan for the Central Ohio region that identifies the most significant causes of serious injuries and fatalities on the local roadway system. The plan establishes a series of goals and benchmarks for safety improvements, identifies existing trends and critical safety priorities, and sets up a framework for how collaboration can improve safety throughout the region. This plan was developed by the Mid-Ohio Regional Planning Commission (MORPC) in collaboration with local, state, and private sector organizations with a wide array of expertise on transportation safety in Central Ohio. The plan will be updated every five years to track trends and measure progress toward the goals.

#### Promote the use of Crash Data and Tools

Through the efforts of both the Ohio Department of Transportation and the Ohio Department of Public Safety, Ohio maintains some of the best crash data within the nation. These data, along with tools and trainings, are available to professionals and the general public across the state. MORPC continues to

promote and advocate for the use of these data and tools, such as ODOT's GIS Crash Analysis Tool (GCAT), when making investment decisions.

## **2. Collect, develop, maintain, and analyze data on transit safety.**

### Public Transportation Agency Safety Plans

FTA requires certain operators of public transportation systems that receive federal funds under FTA's Urbanized Area Formula Grants, including COTA and DCTB, to develop safety plans that include the processes and procedures to implement safety management systems and safety performance targets.

## **3. Implement countermeasures that address priority safety locations.**

As noted earlier, the HSIP requires the allocation of federal funds through a data-driven process to make the best use of these limited resources. The process of identifying and working with our partners to address high-crash locations is central to MORPC's safety planning program. By providing local jurisdictions with a better understanding of where locations exist within the region that experience an overabundance of crashes, MORPC can better work with our partners to acquire the resources necessary to address them.

### Identification of Regional Priority Safety Locations

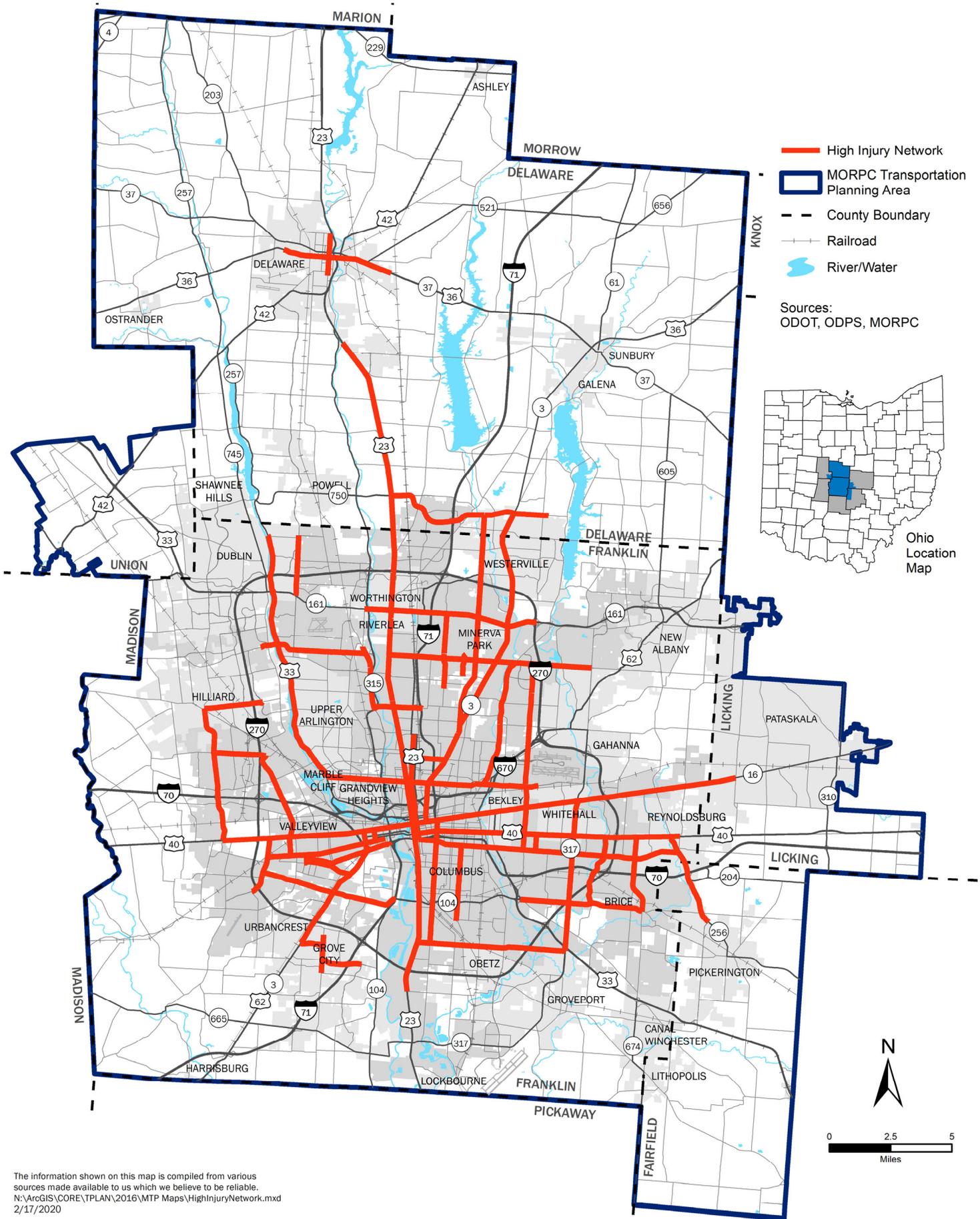
The COTSP that was released in September of 2019 includes information about the regional priority safety locations that were identified for the 2013-2017 time period. Because the plan focuses on fatal and serious injury crashes, the regional priority safety locations identified primarily include locations throughout the region that have experienced a high frequency of those crashes. These priority safety locations help us to prioritize funding, technical assistance, and related efforts throughout the region to mitigate the most serious crashes. The identified locations serve as a starting point for the identification and resolution of traffic safety issues in the region. These locations were used to identify the regional High Injury Network (HIN), as shown in Figure 4.5. The intent of the Central Ohio HIN is to understand which corridors in our region are the most challenging in terms of safety, particularly as it relates to fatal and serious crashes. MORPC continues to work with jurisdictions after these lists are published to further understand the crash patterns at a given location and identify specific strategies and resources to improve them.

### Develop and Implement a Regional Systematic Safety Improvement Program

In 2013, MORPC and ODOT's Highway Safety Program launched a pilot project to develop and implement a replicable process for the identification of locations with a high risk of severe crash types (i.e., pedestrian, intersection crashes) and address them using proven low-to-medium safety countermeasures. To date, this pilot has provided additional safety resources to over 12 local jurisdictions within the MPO planning area and has resulted in the installation of treatments at over a hundred locations. MORPC has and will continue to work with ODOT to ensure these resources are available to local governments, as they provide these agencies with enhanced ability to prevent severe crashes on the locally maintained system.

### Safety Projects & Studies

MORPC continues to work with local jurisdictions to help secure the resources and expertise needed to address the safety issues with which they are confronted. This includes assistance with safety funding applications, project-level crash data analysis, before-and-after analyses, and evaluation of effective countermeasures. Specially, MORPC offers direct technical assistance on safety planning projects and fulfills requests for crash data and analysis. The evaluation techniques used reflect those currently used at the state level, as well as other national best practices.



The information shown on this map is compiled from various sources made available to us which we believe to be reliable.  
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**Figure 4.5**  
**Priority Safety Locations**

#### **4. Implement countermeasures that address transit safety issues.**

##### Technology and Safety

COTA has implemented an updated ITS system including dynamic message signs at key high ridership stops, park and rides, transit centers, and selected shelters that provide riders of fixed-route and paratransit with next bus arrival information via web-enabled mobile technologies such as smart phones, and tablets.

#### **5. Advance educational initiatives that address regional safety emphasis areas.**

MORPC also engages in various efforts to encourage safe behavior. Through these activities, MORPC recognizes that safety is a complex problem; the region must address safety on many levels, not just engineering.

##### Ongoing Regional Safety Education

Throughout the year, MORPC coordinates with the Ohio Department of Public Safety (ODPS) on the promotion of national safety initiatives within the MPO area. MORPC also supports regional/state safety campaigns on local issues through in-kind contributions and technical assistance. Finally, MORPC will promote national best practices and professional development opportunities occurring within Central Ohio such as LTAP and webinars.

##### Franklin County Fatality Review Board

The Franklin County Fatality Review Board meets once per month to review all fatal crashes that occur in the county. These meetings provide an opportunity for law enforcement, engineers, planners, and educators to better understand fatal crashes and develop countermeasures, discuss needs related to safety education, and make suggestions for crash reporting improvements.

##### Franklin County Safe Communities Coalition

Franklin County Safe Communities promotes traffic safety through a coalition of partners from law enforcement, medical professionals, trauma programs, engineers/planners, traffic safety professionals, injury research programs, and community organizations. The goal of the coalition is to reduce traffic-related injuries and fatalities within Franklin County. Members partner on a variety of projects to provide traffic safety education, change policy, change the built environment, and improve safety for all modes of transportation in our community. This coalition meets quarterly and MORPC is an active participant.

##### SAFE Delaware County Coalition

The mission of SAFE (Safety Awareness For Everyone), Delaware County, is to serve as a countywide network that joins community partners, maximizes resources, and provides leadership to prevent injury and fatalities in Delaware County. The purpose of this coalition is to provide injury prevention awareness programs related to traffic safety and child safety. Support for these two programs comes from the Safe Communities grant from the Ohio Department of Public Safety, and the Safe Kids Worldwide grant program. This coalition meets quarterly and MORPC is an active participant.

#### **6. Advance legislative initiatives that address regional safety emphasis areas.**

MORPC works with policy makers at the federal, state, and local levels to ensure an understanding of the safety implications of adopting, or not adopting, specific pieces of transportation legislation. MORPC will continue legislative tracking of key transportation legislation and will advocate for legislative changes to improve the safety of the transportation system.

## 4.d TRANSPORTATION SECURITY & RESILIENCE

Security planning involves monitoring the transportation system to ensure against infrastructure failures. It also requires preparation to deal with situations where the roadway network could fail. Commerce and quality of life in communities require functioning regional transportation networks. During emergencies, these networks allow first responders to reach the event site and to stage and manage their operations. Regional transportation agencies support traffic control, damage assessments and the restoration of critical services. Effective public safety objectives for these agencies range from alternate routing around an incident scene, to evacuations, to long-term mode shifts during recovery.

### BACKGROUND

Central Ohio is home to various threats, such as floods, tornadoes, dam failures, severe thunderstorms and winter storms. Rare and extreme weather events are becoming more common, and we are experiencing greater variation in precipitation events and warmer temperatures. The unexpected and complex nature of these natural and human-caused incidents requires extensive coordination, collaboration and flexibility among all the agencies and organizations involved in the planning, mitigation, response and recovery.

Regional cooperation and coordination are essential to security and emergency preparedness. No significant event is truly local, as political boundaries are permeable and local critical infrastructure may serve the entire region. No jurisdiction stands alone. The high-risk, well-resourced municipality may be as dependent on a smaller jurisdiction for support in an emergency as the smaller jurisdiction is on the larger ones. The complexity of the region, with a range of potential events, presents significant challenges to coordinating and implementing effective homeland security programs.

### TOP RANKED THREATS & HAZARDS

1. Tornadoes
2. Dam Failure
3. Flooding
4. WMD Terrorist Incident
5. Cyber-Terrorism
6. Infectious Disease
7. Severe Winter Weather
8. Hazardous Material Incident
9. Transportation Accident—Aircraft
10. Severe Summer Weather
11. Utility Interruptions or Failures
12. Civil Disturbance
13. Lone-Wolf Terrorist
14. Air and Water Pollution/  
Contamination
15. Extreme Heat
16. Drought
17. Invasive Species
18. Earthquakes

## MORPC'S ROLE IN SECURITY & RESILIENCE

MORPC has no direct role in responding to emergencies. MORPC has federally mandated transportation planning functions, which it should maintain despite the results of a natural or human-created event. Various other organizations carry the primary responsibility for security planning and response. MORPC's role must enhance security planning and activities already in place. To do so, MORPC helps the region coordinate planning in preparation for and anticipation of potential future incidents. It plays a similar role helping to coordinate public information dissemination strategies.

MORPC works with leaders in the Central Ohio region to increase the security of the transportation system for motorized and non-motorized users through initiatives that reduce or eliminate system deficiencies and enhance the integration and connectivity of the transportation system for the purposes of safety, security, and emergency evacuation.

MORPC can serve as a forum for cooperative decision-making outside the immediate urgency of emergencies. MORPC can help fund regional transportation strategies and projects related to security. MORPC has capabilities in technical analysis of the transportation network that can play a critical role in emergency preparedness and security planning. These activities summarized in the strategies identified below.

## SECURITY STRATEGIES AND PROJECTS

Recommendations presented throughout the MTP may help improve transportation security. MORPC and security partners will continue to implement the following strategies and projects.

### 1. Promote and strengthen security, including cyber security.

#### Intelligent Transportation Systems

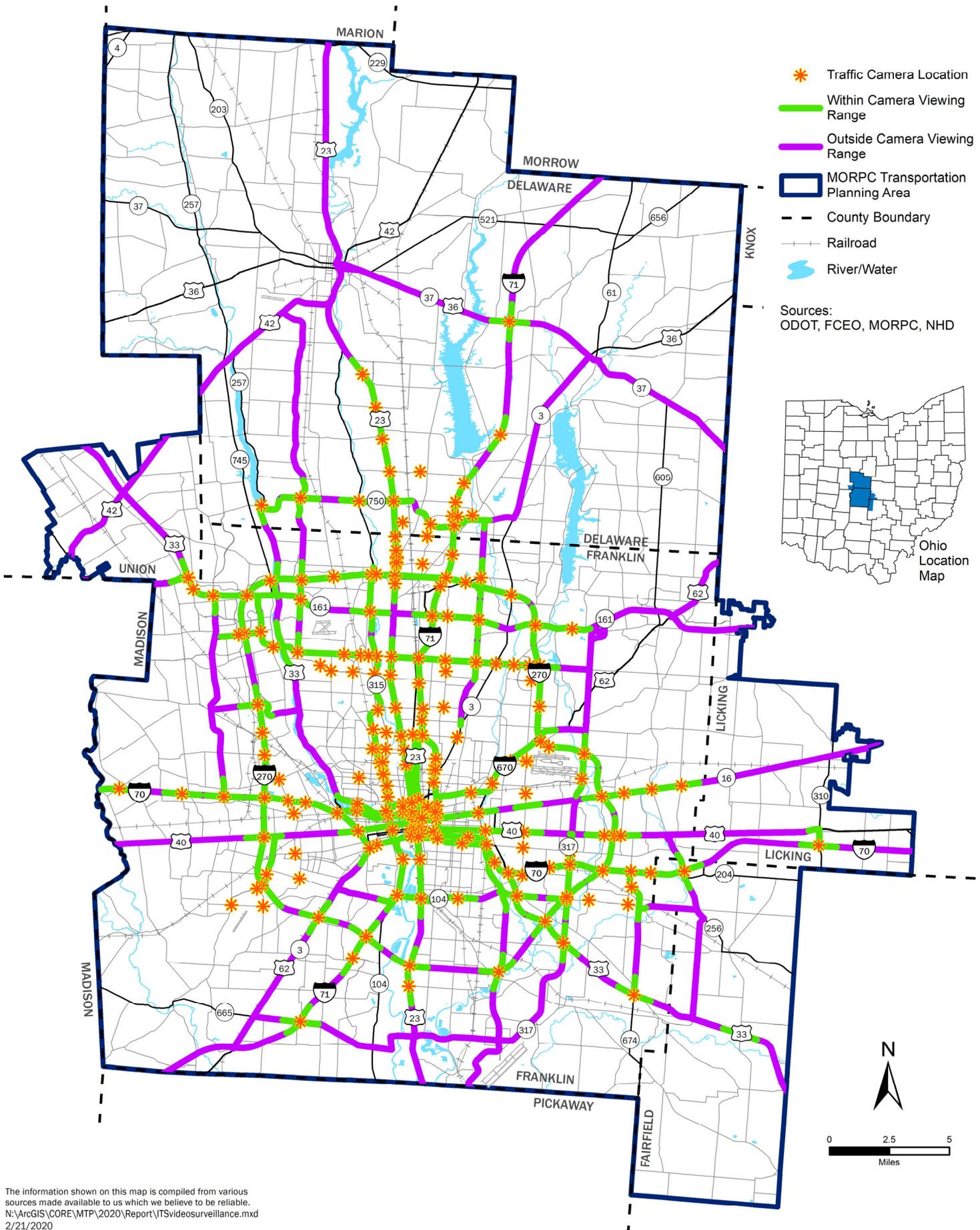
The region will continue to deploy ITS technologies that enhance transportation security, such as the dynamic message signs that share important information about incidents to roadway users (as shown in Figure 4.3). MORPC will promote the use of ITS for transportation security. The Regional ITS Architecture will help integrate emergency preparedness components into ITS projects. See Section 4.2 for more information on ITS.

#### ODOT Statewide Traffic Management Center (TMC)

Also described in Section 4.2, the ODOT Statewide TMC operates traffic management and traveler information system on Ohio's interstates, freeways, expressways, and state highways. The TMC has dedicated operators who monitor traffic in each major metropolitan area across the state. The operators can control cameras, post messages to DMS, HAR, and the Buckeye Traffic website, etc. The operators are monitoring more than 500 traffic cameras around the state in all the major metro areas and also a couple in the more rural areas. The MTP sets a target for 90% of functionally classified arterials and above to be under video surveillance by 2050. Figure 4.6 shows the 40% of arterials and above that are currently monitored by video surveillance.

#### Transit Operations Video Surveillance

Video surveillance on transit vehicles and at transit stops or stations creates a safer environment for transit users. For the safety and security of employees and customers, the Central Ohio Transit Authority utilizes video surveillance equipment on all of its fixed-route buses and facilities. The Delaware Area Transit Agency does not currently employ video surveillance on any of its vehicles or facilities. The MTP sets a target for 100% of transit vehicles and facilities to have surveillance capabilities by 2050.



The information shown on this map is compiled from various sources made available to us which we believe to be reliable.  
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 2/21/2020

**Figure 4.6**  
*Video Surveillance of the Roadway System*

## **2. Promote and strengthen emergency preparedness efforts.**

### Homeland Security Advisory Council

The director of ODPS convenes the Homeland Security Advisory Council (HSAC) to discuss security issues with a variety of state agencies and first responders. MORPC represents the Ohio Association of Regional Councils (OARC).

### Chemical Emergency Preparedness Advisory Council

The Chemical Emergency Preparedness Advisory Council (CEPAC) serves as the official local emergency planning committee (LEPC) for Franklin County.

### Franklin County Emergency Management and Homeland Security (FCEM&HS)

Franklin County Emergency Management & Homeland Security coordinates and prepares for county-wide all-hazards disaster planning, community education, warning, training, grant funding, response, and recovery efforts in order to prepare and protect the citizens of Franklin County before, during, and after natural and man-made disasters.

### Natural Hazards Mitigation

FCEM&HS updated the Franklin County Natural Hazards Mitigation Plan in 2012. This plan guides the mitigation actions communities in the region take to reduce or eliminate the impact of natural hazards. This plan is federally mandated. It allows Franklin County to receive federal funding for mitigation projects. MORPC participated in the update with multiple agencies and jurisdictions and will assist as necessary with ongoing implementation.

### Strategic Highway Network

The Strategic Highway Network (STRAHNET) routes within the MORPC region are essential to accommodate the movement of military supplies and personnel in times of national emergency. STRAHNET routes include the National Interstate System, as well as key non-interstate routes, such as connectors to ports and military installations. MORPC, through its planning processes, identifies the operation and maintenance needs of the interstate and state highway systems within the MPO area, including STRAHNET.

### Automated Critical Asset Management System

The Ohio Department of Public Safety (ODPS) Homeland Security Division maintains the state Constellation/Automated Critical Asset Management System (ACAMS). ACAMS is a web-based system of tools, resources and related training to assist in protecting critical infrastructure and key resources. MORPC continues to work with stakeholders to inventory critical facilities in and elements of the transportation system (e.g., transit system, rails, airports, Interstate system, National Highway System routes, etc.).

### Regional, State and National Security Efforts

MORPC will continue to monitor state and federal legislation for its impact on Central Ohio's transportation security efforts. In addition to these efforts, MORPC will continue to participate in regional groups as appropriate, such as Meta-Leadership, Citizen Corps, and Metropolitan Medical Response System.

While “security” refers to managing and reducing risk, “resiliency” is the ability to adapt to changing conditions. As the region experiences changes in population and demographic make-up, climate, energy supply, and technology, the following strategies will be essential for regional resiliency.

### **3. Collect, develop and maintain data and information to improve decision making.**

#### Local Government Energy Partnerships

MORPC’s Local Government Energy Partnership is a collaborative program offering local governments a variety of programs and services to advance energy saving opportunities.

Together we are creating a sustainable region that:

- Reduces the costs of government
- Attracts businesses and encourages their growth
- Promotes responsible stewardship of our resources

The program aims to bring together stakeholders to catalyze a sustainable energy transformation in Central Ohio. The partnership serves as the nexus between local governments the utilities serving these areas, residents and businesses.

#### Sustaining Scioto

MORPC’s Sustaining Scioto Implementation Plan, developed with stakeholder input during 2019, includes strategies to address the potential impacts of climate change on the region’s water resources. The initial study, completed in 2015, used a science-based approach to affirm that the Central Ohio region is experiencing higher temperatures and higher variability in precipitation. Several threats and vulnerabilities have been identified for a variety of sectors including energy, public health, and transportation. Informed decision making is a central component of the Sustaining Scioto Implementation Plan, which is supported by strategies to create, update and maintain data and tools to help support planning and implementation initiatives.

### **4. Facilitate multi-jurisdictional dialogue to improve opportunities for collaboration.**

MORPC’s programming and committee structure provide opportunities for multi-jurisdictional dialogue and collaboration. We take pride in bringing communities together and convening stakeholders from diverse backgrounds and experiences to collaborate on best practices and plan for the future of our growing region.

#### Sustainability Advisory Committee

The Sustainability Advisory Committee, a top-level committee that reports to the MORPC Board, serves as advisors for MORPC’s sustainability-focused programming. Several working groups and committees report to the Sustainability Advisory Committee, including the Energy & Air Quality Working Group, Sustaining Scioto Board, and Central Ohio Greenways Board.

#### Sustainable2050

MORPC’s Sustainable2050 program supports our members in their sustainability efforts through direct technical assistance, collaboration, and recognition. Members are invited to participate in quarterly forums to learn about local initiatives, collaborate on best practices, and exchange ideas.

MORPC also works with county emergency management agencies (EMAs), such as Franklin County

Emergency Management and Homeland Security (FCEM&HS). MORPC participated as FCEM&HS updated the Risk Assessment for Franklin County. MORPC participates in a variety of other councils and committees on issues related to security and the transportation system.

## **5. Create plans and partnerships to attract investment in alternative fuel vehicles and infrastructure**

MORPC is one of many partners, including ODOT, Clean Fuels Ohio, and MPOs across the state working to expand the FHWA Alternative Fuel Corridor designations. The primary goal is to minimize range anxiety that can inhibit the adoption of alternative fuel vehicles. This designation supports the expansion of an alternative fuel and charging network and will include signage to inform the public of fueling locations across the corridor.

Together, Smart Columbus, Clean Fuels Ohio and MORPC provided outreach to local government members to encourage EV adoption for public fleets by making information and resources available. MORPC has also provided technical services, policy support, and EVSE planning guidance for member governments. MORPC will continue developing partnerships and new opportunities to attract investment in alternative fuel vehicles and infrastructure.

## **6. Implement best management practices for storm water runoff and implementation of green infrastructure.**

### Green Infrastructure Best Management Practices

Changes in our climate, development pressures, stormwater impacts to water quality, and interest in fiscal sustainability have resulted in communities being interested in learning about best practices for green infrastructure when retrofitting and constructing transportation facilities. In order to assist Central Ohio communities with building an environmentally and fiscally sustainable transportation infrastructure network, MORPC is compiling information on best practices for green infrastructure for communities to reference when planning and designing transportation projects. The resource will include local examples of best practices so that its users can visit green infrastructure sites for hands-on learning and ease of communication with those projects' managers for information to help them implement similar best practices.