

System Planning Considerations

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System Planning Considerations



What is a sustainable highway?

Federal Highway Administration defines a sustainable approach to highways as a way to help decision-makers look at balanced choices considering the economy, environment and social values, more specifically at access (not just mobility), movement of people and goods (not just vehicles), and transportation choices for a variety of users. It takes a broader perspective than building a road.

Source: Federal Highway Administration 2021 <https://www.sustainablehighways.dot.gov/overview.aspx#quest1>

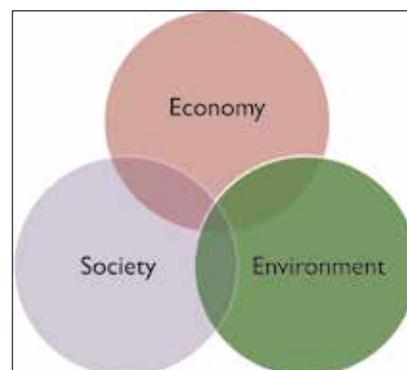
There are a number of considerations both required and common practice in transportation planning. They are reviewed in the context of the metropolitan development goals and transportation objectives noted in Chapter 1. The transportation objectives align with federal transportation emphasis areas to frame how improvements to the transportation network and the system can be advanced. In this chapter, system planning considerations will include discussions on sustainability, resilience, and livability. It will also discuss federal environmental regulations and the types of information that is used to review future transportation projects. Considerations also include land use patterns and economic development, current trends in aging, mobility, public health, environmental justice, and equity. Other planning considerations include examining operations and maintenance, transportation security, and emergency management. The chapter concludes with an overview of the role of federal performance management in metropolitan transportation planning and ways the goals and transportation objectives are linked to plan implementation.

System Planning Considerations

Sustainability, Resilience, and Livability

In transportation plans across America, a triple bottom line has been illustrated, where balance between the use of critical resources (air, water, land, energy, and people) and the effects on the environment, economy, and community (society) allow these resources to be available for generations to come. Education and funding resources continue to be founding elements for creating sustainable practices.

Figure 2.1 – Elements of Sustainability





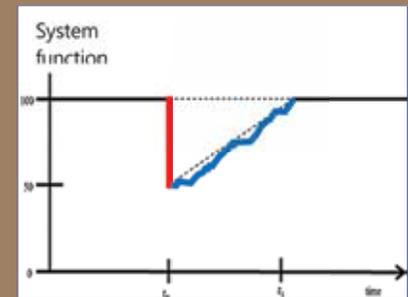
Sustainability

One aspect of this plan is to recognize ways to incorporate sustainable practices into the transportation system. Sustainability is about balancing needs. It is the equilibrium or ideal point where minimal negative effects occur to the environment, economy, and community. If our daily transportation practices – funding decisions, planning, designs, or operations – are off the mark, then aspects of the transportation system may be bearable in the present but not ideal for future generations. Our transportation solutions might be equitable or viable, but they may not be sustainable. A key aspect of sustainability is conserving our resources for future generations to utilize and enjoy. Today's transportation network should sustain our critical resource reserves so others can enjoy them in the future. This is why metropolitan areas are examining sustainability in their policies, operations, and decision-making to affect future generations in the best manner possible.

Resilience

A second aspect of this plan is to consider resilience. Resilience, as defined by the American Association of State Highway and Transportation Officials (AASHTO), is “the ability to prepare and plan for, absorb, recover from, or more successfully adapt to adverse events.” Addressing a more resilient transportation system moves beyond mitigating an event's impact on the transportation system. It also includes reducing the duration of that impact on the system, or maintaining some level of operations during an event or disruptor, such as flooding or a snow storm. As an example, 2019 illustrated the resilience of our transportation system through redundant facilities when U.S. 67/River Drive between Davenport and Bettendorf was closed for record flooding on the Mississippi River, other roadways were utilized for detours. An extreme weather resilience report was prepared by Bi-State Regional Commission in 2020 as part of a Federal Highway Administration pilot program on durability and vulnerability assessment. The report results are to be incorporated into the overall transportation planning process to begin to address a more resilient transportation system in the Quad Cities. The resilience triangle in the side bar illustrates an event or system disrupter as the red line, and the time to recover as the blue line. Shortening the impact and the duration of the disruption to a transportation facility or service is the goal of a more resilient transportation system.

Resilience Triangle



Source: *sciencedirect.com* (adapted from M. Bruneau, S.E. Chang, R.T. Eguchi, G.C. Lee, T.D. O'Rourke, A.M. Reinhorn, M. Shinouzuka, K. Tierney, W.A. Wallace, A framework to quantitatively assess and enhance the seismic resilience of communities, *Earthquake Spectra*, 19 (4) (2003), pp. 733-752)

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Six Livability Principles

- Provide more transportation choices
- Promote equitable and affordable housing
- Enhance economic competitiveness
- Support existing communities
- Coordinate policies and leverage investment
- Value communities and neighborhoods

Livability

A third aspect of this plan is making metropolitan areas more livable. Under the Livable Communities Act of 2009, U.S. Department of Housing and Urban Development (HUD) established a Partnership for Sustainable Communities with U.S. Environmental Protection Agency and U.S. Department of Transportation. The partnership established six livability principles as noted in the sidebar. A key point in this partnership is for better linkages between housing and transportation decisions and their effects. When housing and jobs are in close proximity, then energy benefits can be realized in reduced travel costs and shorter travel times. More travel savings and time offers a greater quality of life and opportunities for the consumer. The livability initiative has been further enhanced by recognizing the use of innovative technologies and collaborations that facilitate data-sharing, effective communications and evidence-based decision-making. The effort is about optimizing travel movements, multi-modal system performance and access using transportation systems management and operations strategies (TSMO). Examples of TSMO strategies include work zone management, traffic incident management, traveler information, access management, improved bicycle and pedestrian crossings, and connected and automated vehicle deployment.

There are a number of physical and social aspects to consider in the environment when planning and constructing transportation projects. This chapter overviews planning considerations that help achieve sustainability, resilience and livability of the Quad Cities MPA transportation system, and the overall transportation system priorities. It also provides an overview of the U.S. Department of Transportation's established national performance goals linked with guidelines to be followed.

Planning Considerations

When developing a sustainable, resilient, and livable transportation system, effects of transportation choices and projects must be considered. Evaluation of environmental effects has been mandated for projects using federal funds since 1969 in the National Environmental Policy Act (NEPA). Sustainability, resilience, and livability are not new. This founding principle of sustainability seeks to balance economic and community effects, as well as environmental effects.



Can we afford a particular transportation choice or project? How will a project affect my city or neighborhood? In addition to federal requirements to review effects, many state-funded projects also require consideration of alternatives and effects as well. In addition to the NEPA aspects, financial planning and economic effects are also important considerations.

National Environmental Policy Act (NEPA)

Impact analysis generally occurs during the preliminary engineering stage of a project when the location of the project is known. This could be for a road, trail, or transit facility. If an analysis is performed prior to this stage, work may be significantly revised because the actual location of the project has moved or because regulatory agency sign-offs may have expired. Because most of the projects listed in this document are in the planning stage of development, impact analysis has not been performed. However, project sponsors are encouraged to begin coordination with environmental, regulatory, and resource agencies early in the project development process to afford the best possible transportation project. Common considerations include a review of water resources, topography, and historic/cultural features, which are included for reference in this chapter. Human environment considerations are part of an environmental justice review and illustrated in Appendix C.

For all projects, a determination of wetland, air quality, community, and other effects must be considered. As listed in the transportation Code of Regulations for environmental procedures, 49 CFR Parts 622 and 623, there are three classes of impact analysis: Class I–Environmental Impact Statements; Class II–Categorical Exclusions; and Class III–Environmental Assessments.

- **Environmental Impact Statements** – These are required for new access-controlled freeways, four or more lane highways on a new alignment, new fixed rail transit facilities, new separate roadways for buses or high-occupancy vehicle lanes, new intercity railroad on new rights-of-way, and new intermodal facilities requiring any of the previous actions.
- **Categorical Exclusions** – These encompass “actions that do not individually or cumulatively have a significant environmental impact.” These include activities such as non-construction activities, highway resurfacing, routine maintenance and equipment

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Mitigation steps include the following actions:

- Avoid an impact by not taking a certain action or parts of an action
- Minimize effects by limiting the degree or magnitude of the action and its implementation
- Correct the impact by repairing, rehabilitating, or restoring the affected environment
- Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action
- Compensate for the impact by replacing or providing a substitute resource or environment, such as wetland mitigation banks

purchases, incorporation of Intelligent Transportation Systems (ITS) into existing transportation facilities, highway and railroad safety activities, improvement of rest areas and weigh stations, car and vanpool projects, emergency repairs, transit operating assistance, transit vehicle acquisition and rehabilitation, existing track improvements, bicycle accommodations within an existing transportation right-of-way, alterations for accessibility to persons with disabilities, fencing, signs, signals, lighting, streetscaping, noise barriers, and habitat conservation.

- **Environmental Assessments** – These are conducted on projects where the scope of environmental effects is not clear and may result in the determination of a Finding of No Significant Impact (FONSI) or the need for an Environmental Impact Statement (EIS).

In regard to the transportation efforts listed in this document, it has been noted that a significant amount of funding will be devoted to maintenance of the existing transportation system. These activities would generally constitute a Categorical Exclusion and would include reconstruction of existing roadways, Congestion Management Process (CMP) and ITS deployment, fleet replacement, continued operations of transit, and use of existing rail lines for freight and passenger efforts. Projects that may require environmental assessments include the paving of existing gravel or sealcoat surfaces.

Major federally-funded new projects on new alignments generally require an EIS. The construction of a new river crossing on a new alignment or the construction of new rail lines on a new right-of-way would likely fall into this category. Projects that may require an environmental assessment are those that increase the number of lanes of existing roadways utilizing existing rights-of-way and the construction of new separate trail facilities.

Jurisdictions within the Quad Cities MPA are encouraged to follow federal guidance as part of environmental sustainability, as well as consider the impacts of extreme weather and livability when reviewing projects. Early consultation with environmental and social resource agencies will ensure the best outcomes and may identify any fatal flaws in the project development process. Mitigation steps are defined in 40 CFR 1508.20 and should be followed by project sponsors.



There are a number of environmental, cultural, and social considerations in regard to planning in particular. These are described in the following sections.

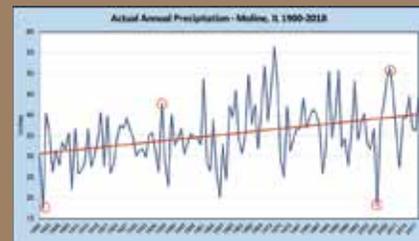
Extreme Weather, Climate Change and Natural Hazards

In the Fourth U.S. National Climate Assessment (NCA₄), “weather” is a short-term, daily occurrence while “climate” describes long-term trends related to averages and prevalence as well as the intensity of extremes. In 2020, Bi-State Regional Commission completed the *Quad Cities, Iowa/Illinois Extreme Weather and Transportation Resilience Report*. Bi-State was one of eleven pilot projects across the United States. The purpose of the project was to develop a path forward to discuss climate change and resilience in the Quad Cities Long Range Transportation Plan and to build in-house capacity on the subject matter.

While climate change and its root cause(s) can be debated, there is general scientific evidence that global temperatures are rising. For the Midwest (NCA₄), research shows decreased severity and frequency of cold temperature waves but an increased severity and frequency of precipitation events, heat waves, and floods. Figure 2.2 shows the rising trend for annual precipitation at Moline, Illinois. There is also a correlation to increases in greenhouse gases as well as changing weather patterns and storm intensities. Transportation with its combustion of fossil fuels has been identified as a primary contributor of greenhouse gases. Reducing vehicle emissions, changing travel behavior, and seeking technological alternatives to fossil fuel usage are seen as solutions to reduce greenhouse gases and mitigate climate change. In the short term, there will be benefits locally to improved air quality. In the long term, reductions in greenhouse gases are expected to slow climate change.

From a transportation risk management perspective, planning for increased storm intensities and extremes in temperature will provide for a more resilient transportation system. Extreme weather events may result in increased flooding; an increase in the frequency and severity of storms or other weather events, such as droughts and wildfires; effects to water availability and quality; and effects to crops. Effects to transportation infrastructure could include accelerated deterioration of roadways due to increased freeze-thaw cycles. Trans-

Figure 2.2 Actual Annual Precipitation-Moline, IL 1900-2018



Source: National Weather Service

System Planning Considerations



Figure 2.3 U.S. 67/River Drive, Davenport and Temporary Flood Barrier (2019)

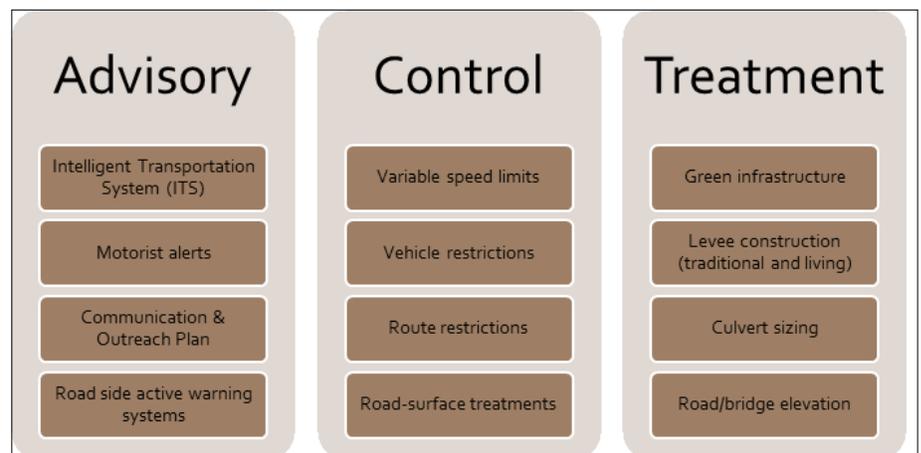


Source: Bi-State Regional Commission 2019

portation network closures, detours or delays may become more frequent and will require increased stormwater management bridge inspections, repair of road and rail buckling, and shipping alternatives with reduced water levels in rivers that could affect the barge traffic. Figure 2.3 illustrates the effects of record Mississippi River flooding on principle arterial roads with a road closure due to flooding.

Mitigating these hazards through a redundant and well-designed transportation system will provide greater safety and security from both natural and man-made hazards. There are an array of adaptation strategies to provide effective solutions to extreme weather disruptions. Three main categories include adaptations based on control, advisory or treatment, as shown in Figure 2.4. These will also reduce costly repairs and maintenance if considered as part of the overall project design. Both Rock Island and Scott Counties have a Federal Emergency Management Agency-approved hazard mitigation plan to utilize as a reference for project planning and design. Henry County is working on a plan update that will include Stark County (2021-2022). Hazards for the Quad Cities MPA are identified in these documents. Evacuation plans have also been prepared for these counties and include the MPA as part of preparedness efforts.

Figure 2.4 Adaptation Strategies as Potential Solutions to Mitigate Extreme Weather Events



Source: ASAM et. Al., Federal Highway Administration 2015



Natural/Cultural Resources

Air Quality

The Quad Cities MPA is designated “in attainment” for all air pollutants as of January 2021. Since the fall of 1998, Bi-State Regional Commission staff has coordinated a coalition of local government and private sector representatives committed to clean air and protection of citizen health in the Bi-State Region. The task force works toward voluntary emission reductions and education to address National Ambient Air Quality Standards (NAAQS). Over the last decade, the area has experienced a few summer days where ozone levels in the atmosphere had been considered unhealthy as a result of more stringent standards. Similarly, it has experienced winter episodes where fine particulates have been measured as unhealthy. Overall, the general air quality in the Quad Cities is considered good.

In recognition of more stringent standards, the Bi-State Region Air Quality Task Force was formed to raise awareness within the community in order to reduce air pollution emissions from a variety of sources. The task force includes the entire five-county Bi-State Region, recognizing air quality is regional in nature.

The task force held an Air Quality Summit in 2009 and launched the Bi-State Clean Air Partnership, seeking voluntary emission reduction pledges from area businesses, governments, and organizations. Partnership members are encouraged to consider alternative fuels, commuter choices, energy conservation, and other emission reduction efforts. The number of pledges continues to grow. Promotional efforts have included newspaper tabs, brochures, and fact sheets with information on how individuals can make a difference, such as driving less, using alternative fuels/vehicles, trip combining, using auto alternatives (walking and transit), and postponing activities like mowing and painting on hot days. In the future, the task force will continue public education efforts and explore additional emissions reduction opportunities.

Over the past 10 years, various education and outreach efforts have included:

- Electric and CNG bus utilization for public transit

Bi-State Region Air Quality Task Force mission statement is:

- To maintain attainment status for ground level ozone and fine particulates through voluntary measures
- To provide a means of communication between public and private entities regarding voluntary ground level ozone improvement activities to share experiences and knowledge
- To support individual and collective voluntary emission reduction activities such as public education and mobile and stationary source reduction initiatives

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- Transportation alternatives advertised on television, newspaper, and radio
- Public and private employer outreach projects and meetings
- QC Transit Web Portal development/transit marketing and QC Rideshare Portal as part of larger State of Iowa Rideshare matching service
- Local government joint purchasing green initiatives for janitorial supplies
- Expansion of multipurpose trail network and development of the QCTrails.com website
- Collaboration with Quad City Health Initiative
- Air quality summit, clean fuels/fleets workshop, and clean energy workshop
- Outdoor Air Quality Strategic Plan update
- Collaboration with Iowa Clean Cities Coalition
- Partnership with ALCOA and their Make an Impact program
- Participation in Eastern Iowa Electric Vehicle Readiness Plan development

These efforts among others will continue to aid voluntary emission reduction goals and contribute to improving air quality in the Quad Cities MPA over the long term. These efforts have cumulatively and continuously kept the Quad Cities MPA in non-attainment status. Figure 2.5 is an example of the QC Rideshare website landing page launched in 2018.

In 2019, Bi-State received funding from the Quad Cities Community Foundation to host an alternative energy workshop. Solar and wind energy were featured as viable options in the Bi-State Region, and coincided with the State of Illinois' Future Energy Jobs Act to stimulate the development of renewable energy in the state. Diversifying energy sources will contribute to a more resilient and robust energy network and to cleaner air.

Water Resources

There are a number of water resources in the MPA including the Mississippi and Rock Rivers and their tributaries. Chapter 1 touched on these resources. The Federal Emergency Management Agency (FEMA) has mapped Rock Island and Scott Counties for flood zones.



There are a number of communities protected by levees along the Mississippi River while others are not. It is important to examine how floodplains may affect and/or be affected by a project as well as opening natural areas to development. Rock Island County Soil and Water Conservation District (SWCD) suggests avoiding fragmentation of natural areas, including water resources due to new transportation projects.

The U.S. Army Corps of Engineers regulates navigable waterways and should be consulted as transportation project planning occurs. Additionally, there are numerous wetlands in the planning area. Wetlands can be identified using U.S. Fish and Wildlife National Wetland Inventory Maps. A Special Area Management Plan (SAMP) exists for the Rock River valley in the Illinois Quad Cities from the headwaters at the Mississippi River east to the Carbon Cliff vicinity. Rock Island County Soil and Water Conservation District indicates that this segment of the Rock River is one of the last remaining contiguous corridors of riparian forest within the Illinois Quad Cities, particularly in the area of the Moline-East Moline border and between Coal Valley and Colona. This area provides important values for water quality, storage and retention of floodwaters, a number of rare and endangered wildlife species, and recreation.

The U.S. Fish and Wildlife Service notes critical wetlands within the MPA as part of the resource agency consultation process. There are no wild and scenic rivers and no sole source aquifers designated in the MPA. Map 2.1 identifies water resources and hazards within the planning boundary that may affect alignment, materials, or design of a transportation project.

Water resources are affected by climate change, either extremes related to too much water resulting in flooding or too little water resulting in drought. This can vary widely by year, but it is the long-term trends that urban design and transportation planning consider to reduce impacts on infrastructure and facilities. The National Weather Service demonstrates an upward trend in the amount of precipitation between 1901 and 2017. This trend line shown in Figure 2.2 corresponds with a nearly 10-inch increase in current average annual precipitation, as compared to the beginning of the century. As this statistic indicates, building across and near streams and rivers will require taking into account these trends as facilities are designed.

Figure 2.5 QC Rideshare Landing Page



Source: Bi-State Regional Commission and Iowa Rideshare <https://www.iowarideshare.org/Public/Home.aspx?CustomSubSite=qcrideshare>

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Habitat: Bird Nest along Hennepin Canal



Source: Patty Pearson 2013

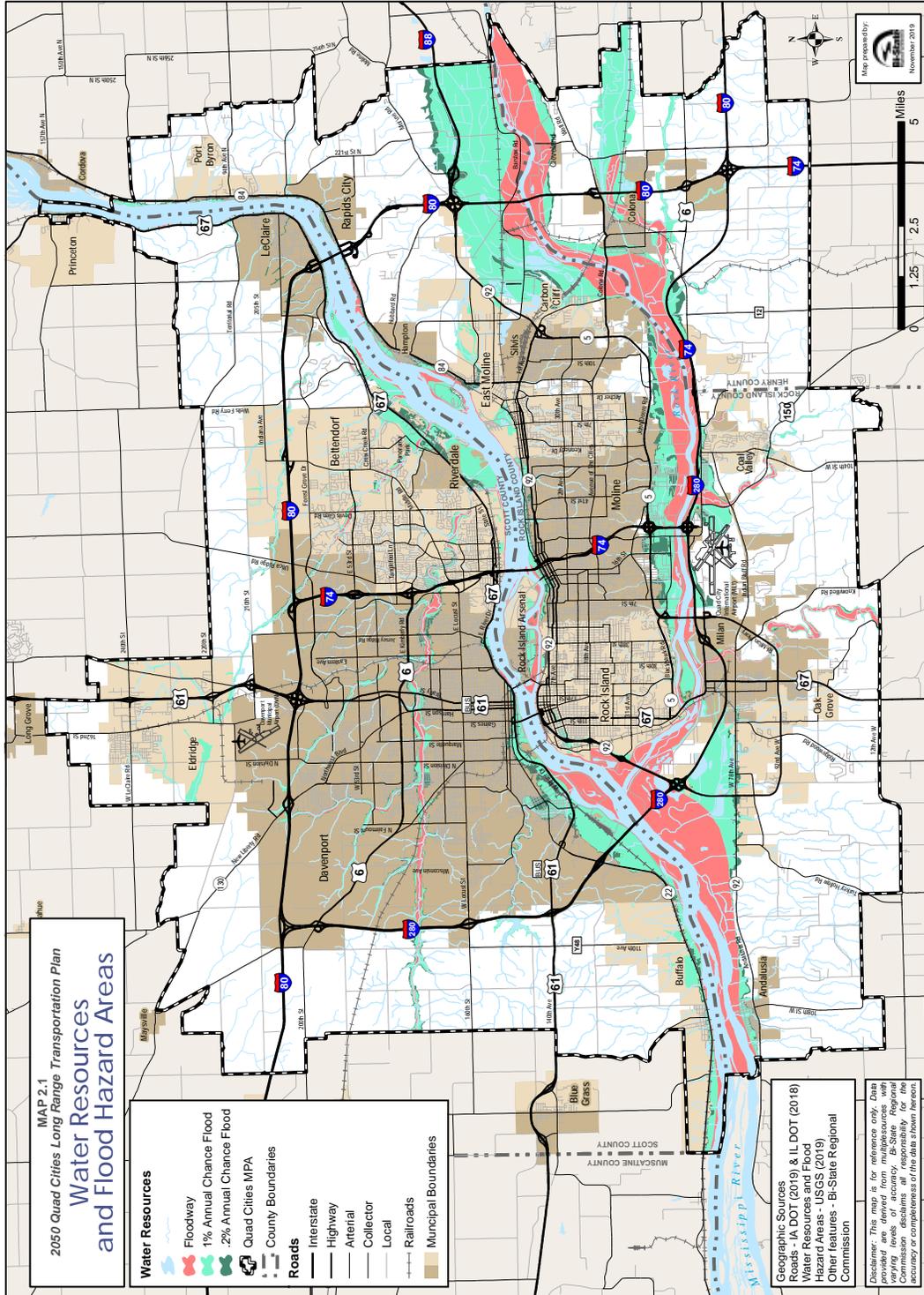
Endangered Species

There are known endangered species in the planning area. The U.S. Fish and Wildlife Service provides a website with a listing.¹ From a wildlife perspective, the Mississippi River is recognized as a “Nationally Significant Ecological Resource” by Congress. Area wetlands offer fish and wildlife habitats. The area is part of the Mississippi Flyway for migratory birds. Additionally, there are both cave bats and migratory bats that require special mitigation measures in certain transportation construction situations. A significant population of eagles can be found wintering in the Quad Cities Area. The river is also home to a tremendous variety of aquatic organisms. The river contains over 29 species of freshwater mussels above Lock and Dam 15, including the federally-listed endangered Higgin’s eye pearly mussel. Three mussels are on the federal endangered species list. The I-74 Mississippi River Bridge replacement project required moving 140,000 mussels from the direct impact zone of the new bridge piers, and will require additional relocation of mussels prior to demolition of the old bridge.¹ Other federally-listed endangered species in the Quad Cities Area include at least ten plants, ten fish, five mammals, two insects, one reptile, and four birds.

¹ [http://Midwest.fws.gov/Rock Island](http://Midwest.fws.gov/Rock%20Island)



Map 2.1 – Water Resources and Flood Hazard Areas



System Planning Considerations



Farmland in Scott County, Iowa



Source: *Bi-State Regional Commission*
2015

Farmland, Land Resources, and Landforms

The planning area is abundant with prime farmland, particularly along the periphery of the urban area. Agriculture is rooted in the history and traditions of the Quad Cities MPA. Both Rock Island and Scott Counties encourage development to be located within existing corporate limits to preserve farmland as part of their respective land development plans. Farmland determinations are often related to soil suitability, which can be obtained from the Natural Resources Conservation Service (NRCS) and county Soil and Water Conservation Districts (SWCD). Input received from the Rock Island County SWCD indicates transportation planning and NEPA analysis should address effects on highly productive agricultural soils – those classified as “prime” farmland by the United States Department of Agriculture.

In addition to soil suitability, slope is often a consideration in determining environmental effects. With the river valleys and bluffs, there are many areas with significant slope where erosion and runoff may be an issue in the planning area. Map 2.2 illustrates the topography of the Quad Cities MPA as a shaded relief map. The terrain within a project area may affect transportation facility design. Subsurface effects should also be reviewed. The Illinois Quad Cities has historically been undermined for coal, and there are other mining operations in the area, such as limestone quarries and mines.

Historic and Cultural Resources

The Quad Cities hosts a wealth of historic and cultural resources. Historically, the Quad Cities Area was home to a variety of indigenous people; therefore, archeologically-significant sites may affect transportation developments and other land uses. Native Americans historically lived along the shores of the area rivers and streams where remains of their culture can be found. There is a rich history of settlement as westward expansion of the United States created a crossroads of rail and river navigation in the heart of the Quad Cities MPA. The Rock Island Arsenal was the site of Civil War activities and hosts national cemeteries, and there are many fine examples of Victorian-era architecture, among others. The Arsenal is also the site of the first railroad bridge built across the Mississippi River. The Government Bridge as it stands today, is the fourth iteration of a bridge in that vicinity. Figure 2.6 shows how integration of a newer multi-



purpose trail within a historical setting can occur. Contact with either the Illinois or Iowa State Historic Preservation Office is often part of transportation project development to determine archeological or historic significance in the vicinity of a project.

Figure 2.6 Mississippi River Trail and Fort Armstrong Avenue, Rock Island Arsenal at Government Bridge

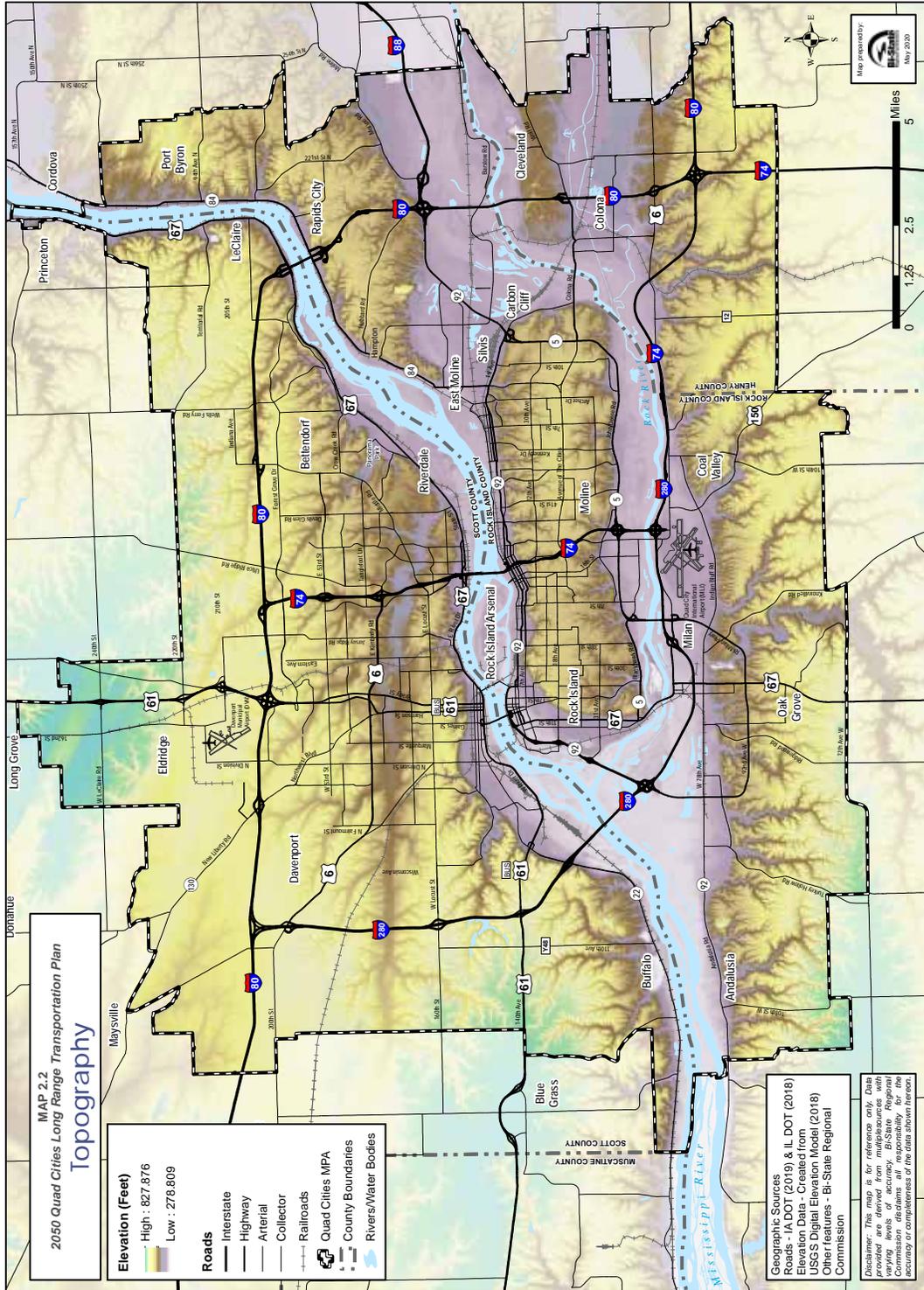


Source: *Bi-State Regional Commission 2015*

System Planning Considerations



Map 2.2 – Topographic Map





Planning Trends and Land Use Patterns

Using the area profile and understanding the trends shaping where we live and how we work, the Quad Cities Area can examine metropolitan and regional strengths and weaknesses. The area profile can also offer possibilities for positioning the Quad Cities Area for future development and for planning for those effects through the use and implementation of a multi-modal transportation system.

Aging and Mobility

More people are living longer. The lifespan in 1900 was 47 years while the average lifespan according to the 2018 U.S. Centers for Disease Control and Prevention is 78.7 years old. According to the U.S. Census Bureau's 2018 American Community Survey 5-Year Estimates, 15.2% of the U.S. population was age 65 and older. It is estimated that by 2050, those 65 and older will comprise 53% greater number of people than in 2020. This growing aging population will have an impact on transportation infrastructure. Changes in work status, healthcare needs, disparities in health by race and ethnicity, geographic concentration, shrinking family/friends social network, and greater physical disabilities will influence how this age group will choose and use transportation. (National Academies of Sciences, Engineering and Medicine, *Future Directions for the Demography of Aging* 2018). As people age, older adults may develop physical, sensory, and cognitive limitations that often restrict their ability to drive, walk, or use public transportation. Pew Research (2019) indicates people in the United States 60 years and older spend half their waking hours alone or about 10 hours per day (Livingston, FactTank, July 3, 2019) and this is closely associated with living arrangements. Opportunities for alternative transportation and neighborhoods with greater connectivity to essential services and parks/recreation may help reduce health impacts of social isolation. Recognition of these demographic changes can help shape transportation planning and investment to better serve our aging population.

The change in population is coming quickly. The first of the Baby Boomers generation started to turn 65 years old in 2011. The "Baby Boomers" are defined as those born between 1946 and 1962. According to the 2018 American Community Survey, the "Baby Boomer" age group of approximately 45-64 accounted for 26.4% of the Quad Cities Area. Table 2.1 shows the projected U.S. population totals by

Senior Mobility Via River Bend Transit



*Source: Bi-State Regional Commission
2015*

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age. From 2020 to 2050, the age group of 65 and over will have large population gains, along with the age cohorts of those aged 75-100+. The table also illustrates that the median age will slightly increase from 2020 to 2050.

Table 2.1 – Projected U.S. Population Totals by Age (in thousands)

Age	2020	2030	2040	2050	Percent Change 2020 to 2050
Under 20 years	82,447	84,118	85,990	87,183	6%
20 to 64	194,140	197,846	206,713	216,064	11%
65 years and over	56,052	73,138	80,827	85,675	53%
65-69	18,030	20,144	18,312	20,460	13%
70-74	14,759	18,542	17,567	17,744	20%
75-79	10,053	14,768	16,827	15,592	55%
80-84	6,508	10,609	13,690	13,317	105%
85-89	3,943	5,695	8,707	10,252	160%
90-94	2,017	2,455	4,269	5,817	188%
95-99	649	784	1,257	2,106	224%
100+	92	140	196	386	320%
Median age (years)	38.52	40.08	41.50	42.31	

Source: U.S. Census Bureau, Population Division. Projected 5-Year Age Groups and Sex Composition: 2017-2060.

Urban Activity and Land Use

Urban activity, land use, and the socio-economic profile of a metropolitan area are the fundamental components used to determine travel demand. Urban activity is described as things people do within towns and cities, and in turn moving place to place to do this activity creates the demand for the transportation network, either roads, trails, transit routes, or sidewalks. Land use can be described in terms of character, intensity, and location of activities. Socio-economic data quantifies these activities through population, employment, dwellings, and school enrollment.



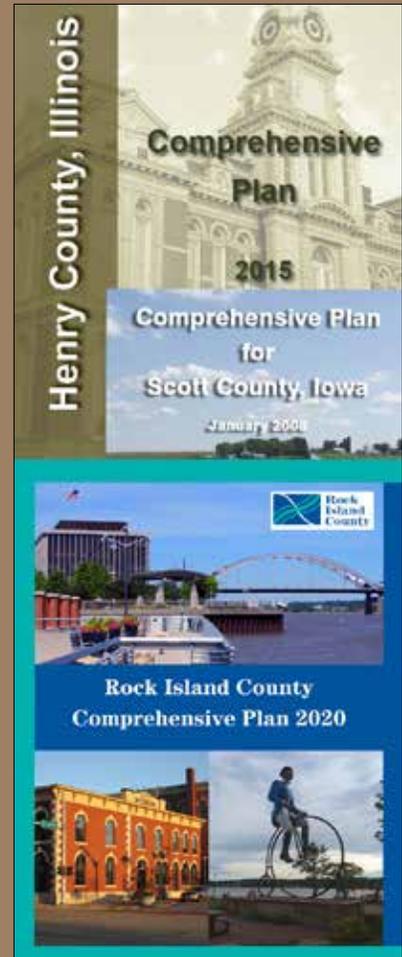
Land use patterns have important influences on transportation. Land use defines where people live and where they work, learn, or play. Land use patterns shape the nature of socio-economic data by reflecting urban and non-urban activity through population, employment, dwelling units, school enrollment, etc. Some locations represent areas with a greater density or concentration of urban activity: residential, commercial, industrial, institutional, or recreational land uses; or lesser density of activity that may include agriculture, parks, and open space. Transportation provides the link between land uses for the movement of goods from area to area.

For the Quad Cities Area, communities and counties guide their respective development using a general plan or comprehensive land use plan. These comprehensive plans establish land use policies and goals to control and direct future growth and development. In the last 10 to 15 years, the majority of the communities in the Quad Cities Area have updated, revised, or created a comprehensive land use plan. Many communities seek to balance new development and re-development. They promote infill in older areas of a community and support new development areas in and around corporate boundaries. Proposed development areas may overlap between communities, but for the majority of these areas, the plans are generally consistent for similar proposed land uses. Both Rock Island and Scott County comprehensive development plans encourage development to locate in or near municipalities with infrastructure and services. In unincorporated areas, development of productive farmland and environmentally-sensitive areas is discouraged.

Map 1.6 in Chapter 1 illustrates the existing land use compiled from parcel data from city, township, and county assessor information. Map 1.7 in Chapter 1 shows future land use derived from county and communities' comprehensive plans within the planning area and direct conversations on future development areas. Table 1.3 in Chapter 1 outlines the urban activity description by land use type used in this plan. The land area within the MPA Planning Area represents 391.12 square miles.

Land use is controlled by local governments through their respective development codes/regulations, such as zoning, specialized overlay districts, subdivision, floodplain management, stormwater management, and erosion control ordinances. Coupled with a compre-

Examples of Comprehensive Plans Created by Bi-State Regional Commission



System Planning Considerations



Quad Cities Health Statistics

- Obesity 37.4% (2018)

Leading Cause of Death

- Heart Disease 23.1% (2016)



hensive plan, these tools help establish orderly land use patterns for residential areas, business districts, industrial parks, transportation facilities, and public facilities and services. They also help to maximize efficient use of the land and minimize conflicts between uses while protecting land use values and reducing public service costs.

Regional Economic and Service Centers

As noted above, urban activity influences the transportation system. The metropolitan area is attractive for living and working because of its employment, service, and recreational assets. Map 1.9 in Chapter 1 illustrates accessibility to major employers. It is important that populations that may be affected and/or traditionally underserved by the transportation system are given equitable opportunities to utilize the public transportation systems. These are populations where there are households with no vehicle, lower incomes, and a potential labor force based on age. Areas of most concern are those shaded areas where there is a higher concentration of people with needs for employment and less access to transportation. Map 1.10 in Chapter 1 illustrates areas with a higher population of 65 and older, individuals with disabilities, and households without a vehicle in comparison to major medical centers and service centers. The map identifies where mobility gaps may exist with these populations. These maps help identify areas within the metropolitan area where transportation system refinements or new facilities may be necessary to serve critical needs.

Public Health

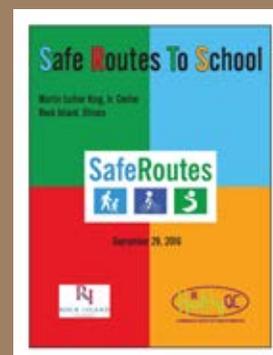
Transportation systems and communities as a whole are recognizing trends between a community's transportation network and its correlation with the community's overall health. Bi-State Regional Commission is actively engaged with the Quad City Health Initiative (QCHI) and its Be Healthy QC committee to address the built environment as it relates to public health. Individuals that travel by walking or bicycling are experiencing the benefits of physical activity, which in return can help to prevent weight gain, obesity, and diabetes, among other negative health-related risks. According to the Centers for Disease Control and Prevention (CDC), the prevalence of obesity in adults was 42.4% with the highest prevalence among non-Hispanic



black adults compared with other race and Hispanic-origin groups.² The prevalence of obesity in the Quad Cities is 37.4% (2018), which is up from 24.1% in 2002 (PRC Community Health Assessment 2017). In the 2018 Quad Cities Health Assessment, the leading cause of death in the Quad Cities is heart disease at 23.1% (2016). Be Healthy QC supports cross-sector conversations on health and transportation. In turn, Bi-State Regional Commission assists local governments with short and long-range planning for sidewalks, and multipurpose trails and bicycle facilities, as well as assisting with Safe Routes to Schools planning and grant assistance for implementation. Additionally, Bi-State Regional Commissions a web-based trails website, www.QCtrails.org, for the bi-state region and partners with QCHI on its promotion.

Accessibility to public transportation options and developing walkable communities can aid in an increase in active lifestyles for residents and encourage healthy patterns. Land use decisions that support transit-oriented development, "Complete Streets," and ADA accessibility provide a foundation for changing our urban area to increase connectivity and mobility of residents and visitors. In addition, an increase in active commuting patterns may lead to a positive effect on a community's air quality, prevent traffic injuries and death, decrease the cost of health insurance, and enhance the overall quality of life. Transportation safety is another aspect of public health, as just noted. Motor vehicle accidents is the leading cause of accidental death (2014-16) representing 21.2% (PRC Community Health Assessment 2017). Chapter 4 discusses vehicle crashes and the related emphasis areas. Chapter 6 highlights crashes involving pedestrians and bicycles, pointing to a need to use urban design to incorporate both safety and physical activity access into how we move around the metro area.

Using 2018 ACS data, throughout the Quad Cities MPA, there are 0.4% that commute by bicycle (.01% increase from 2013), 1.5% that commute by walking (0.5% decrease from 2013), and 0.7% that commute by public transportation (0.4% decrease from 2013), for a total of 2.6% of the population that commutes using an alternative mode



² Center for Disease Control, <http://www.cdc.gov/obesity/data/adult.html>

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Bicyclists on Mississippi River Trail at Ben Butterworth Parkway, Moline, Illinois



Source: *Bi-State Regional Commission* 2015

of transportation. In 2018, 2.6% worked from home. As a result of the COVID-19 pandemic (2020-2021), this number is expected to be much higher. According to Pew Research Center (December 2020) nationally, 71% were currently working from home, and 54% would prefer to continue to work from home after the pandemic. The ability to work from home was not as available to low income workers with 76% of lower income workers indicating their responsibilities of the job cannot be done from home.³ While the shift may continue and reduce travel demand, there will continue to be a need for work places and those, in particular that serve essential needs. Efforts to expand the availability and accessibility of sidewalks, trails, and transit continues to increase in the Quad Cities MPA, encouraging alternative modes of travel and increased physical activity. Promoting travel by walking or bicycling, and supplementing travel with transit, locally affects communities in a positive way through improved public health via increased safety and physical activity, more robust economies, and an improved environment. Further discussion of the Quad Cities MPA multipurpose trails and pedestrian network is outlined in Chapter 6. A more detailed outline of the Quad Cities MPA passenger transportation systems is provided in Chapter 5.

The Quad Cities MPA and the Bi-State Region have increased efforts to encourage the use of alternative modes of transportation through the promotion of the Bi-State Clean Air Partnership and Air Quality Task force that meets quarterly, and through the Bi-State Regional Trails Committee that meets bi-monthly. In fall 2014, the Quad City Health Initiative by the Centers for Disease Control and Prevention (CDC) received a Partnerships to Improve Community Health (PICH) grant in which Bi-State was identified as one of the grant's subcontractors. One component of the grant included an effort to increase the number of elementary schools that have increased physical activity opportunities through Safe Routes to School Travel Plans. The grant also resulted in the implementation of an interactive web-based trails map for the public to increase access to physical activity opportunities in the Quad Cities MPA. Users of the website are able to receive badges when they log certain rides and/or activities. The grant ended in fall 2016.

³ Parker, K., Horowitz, J.M. and Minkin, R. How the Coronavirus Outbreak Has – and Hasn't – Changed the Way Americans Work, Pew Research Center, Social and Demographic Trends, December 9, 2020.



Resilience and Hazards Planning

The World Resources Institute (May 2016) suggested five emerging trends related to climate resilience, including making individual lives more livable, integrating climate hazards into local and state adaptation strategies, evaluating infrastructure improvements with a resilience lens, utilizing nature-based solutions, and mainstreaming resilience into development planning. From the 2020 FHWA extreme weather resilience pilot program, pilot participants suggested growing local capacity understanding resilience, integrating available data into decision-making, valuing the cost of disruptions, taking a proactive approach to collaboration, and using the knowledge and data to inform the planning process.

Developing a transportation system that provides security and reliability is important to the sustainability and resilience of a community. Resilience refers to the ability to accommodate unforeseen variables with the capacity to avoid catastrophic failures or events. The sidebar defines important terms related to resilience. Key elements are related to protecting or making transportation assets more durable. Assessing risk and exposure and determining critical and vulnerability facilities is important to prioritize assets and determine investments.

The Quad Cities MPA could potentially experience an array of catastrophic events, man-made or natural, including:

- Transportation incident – highway, rail, waterway, or air
 - Hazardous chemical release
 - Crash/fire
- Fixed hazardous material release
 - Radiation incident at Exelon Nuclear Power Plant (Cordova, Illinois)
 - Other hazard chemical release
- Flood event
- Storm or weather incident with related power outages lasting more than 48 hours
- Terrorist action/threat or Civil Unrest

Important Definitions Related to Resilience for Extreme Weather and Climate Change

Adaptation – Adjustment in natural or human systems in anticipation of or response to a changing environment in a way that effectively uses beneficial opportunities or reduces negative effects.

Asset – Refers to both physical transportation infrastructure – roads, bridges, rail, etc. - as well as support facilities – vehicles, intelligent transportation systems, ecosystem-related projects.

Exposure – Refers to whether an asset or system is located in an area experiencing direct effects of climate variability and extreme weather events. Exposure is a prerequisite for vulnerability.

Resilience – The ability to anticipate, prepare for and adapt to changing conditions, and withstand, respond to, and recover rapidly from disruptions.

Risk – A combination of the likelihood that an asset will experience a particular climate impact, and the severity or consequence of that impact.

Vulnerability – The degree to which a system is susceptible to, or unable to cope with adverse effects of climate change or extreme weather events.

Source: Federal Highway Administration (FHWA), Vulnerability Assessment and Adaptation Framework, Third Edition, December 2017

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In the 2020 *Quad Cities, Iowa/Illinois Extreme Weather and Transportation Resilience Report*, a vulnerability assessment determined flooding as the most prevalent extreme weather event impacting the metropolitan area, and also noted ice/snow, wind, freeze-thaw cycles, and extreme temperatures as other disruptors.

Mobility is a key component during the time of a natural disaster, and providing transportation alternatives for residents and/or goods under extreme conditions is critical. An efficient transportation system is part of the foundation of a resilient community. A redundant system, such as a street grid and multiple bridge crossings, provides alternative choices when certain facilities are impacted. In 2019 for example, River Drive in Davenport was closed to through traffic for a few months due to record Mississippi River flooding. Fortunately, there were alternative detours available that helped reduce travel disruptions.

In May 2014, the *Illinois Bi-State Region: A Preparedness Resource Guide for Evacuation Events* document was developed for Henry, Mercer, and Rock Island Counties. This plan was preceded by the *Scott County Evacuation Plan* from 2008. In both cases, these counties have a guiding document in the event an evacuation would be necessary. Emergency planning is a regional planning effort taking into account the overflow of people and/or goods from one county to another during an evacuation. In the Quad Cities MPA, this means a two-state approach that has been exemplified by joint Rock Island and Scott County efforts in addressing COVID-19 response and recovery. The framework of both plans is intended to allow for right-sizing of the evacuation based on the magnitude of the trigger or event, either local or regional.

In addition, in 2020, Scott and Rock Island Counties completed minor updates to their multi-hazard mitigation plans. The 2018 *Scott County Multi-Jurisdictional Hazard Mitigation Plan* will be updated fully prior to 2023. Rock Island County adopted the *Rock Island County Multi-Jurisdictional Local Hazard Mitigation Plan* in 2016. Rock Island County's hazard mitigation plan is currently in the process of being updated with a goal for final adoption set for 2021. Both plans enable communities to be proactive in their hazard mitigation planning by minimizing or eliminating potential risks to hazards, and also allows eligibility for certain Federal Emergency Management Agency (FEMA) funds.



The plans also identify the planning areas' vulnerability to potential hazards.

Economic Development

The Quad Cities MPA within the Bi-State Region is one of over 320 Economic Development Districts around the country. Each year, economic development goals and projects are identified in the Comprehensive Economic Development Strategy (CEDS) document as part of progress reports. The full CEDS document is updated every five years, similar to the Long Range Transportation Plan. The vision is consistent in both documents and emphasizes resilience. One of the CEDS goals is to maintain and provide infrastructure, including technology that supports business growth and expansion. It also suggests promoting the redevelopment of blighted, underused, or vacant and environmentally-challenged sites with high market potential. These types of sites may require access improvements either through roads, rail, or riverfront. This long range transportation plan is aligned with the CEDS and represents economic development priorities of the Quad Cities MPA and greater Bi-State Region.

Other Impacts

When evaluating transportation project impacts, consideration should be given to other physical impacts, such as noise control, stormwater control, and man-made hazards. With the commercial and general aviation airports in the planning area, Runway Clear Zones have been designated with development height limitations in the vicinity of these facilities. Consultation with authorities at the Quad City International Airport and the Davenport Municipal Airport should occur if a project is adjacent or in proximity to either airport. Consultation with cities and counties related to their stormwater management regulations should be addressed. These regulations strive to limit runoff and erosion from occurring as a result of construction.

Environmental Justice – Diversity, Equity and Inclusion

In 2020, diversity, equity, and inclusion were at the national forefront of protests, media cover and dialogs among many organizations. In 2019, the American Planning Association published a *Planning for*

Making Our Communities Better

Diversity – *Includes all ways in which people differ, encompassing the different characteristics that make one individual or group different from another. It recognizes that individuals affiliate with multiple identities.*

Equity – *Is fair treatment, access, opportunity and advancement for all people, while at the same time striving to identify and eliminate barriers that have prevented full participation in some groups.*

Inclusion – *Creating an environment in which any individual or group is and feels welcome, respected, supported, valued and able to fully participate.*

Source: Code for America, Our Vision of DEI, website 2021

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*Equity Policy Guide (2019)*⁴ as conversations were occurring within the planning community. This guide outlines why diversity, equity, and inclusion are important to the advancement of communities. This policy guide identified three cross-cutting issues including gentrification (neighborhood changes characterized by dislocation of existing lower income residents, generally by higher-income residents as part of redevelopment), environmental justice, and community engagement/empowerment.

Environmental justice addresses adverse human health and environmental effects to minority and low-income populations. This analysis has been an underlying requirement in transportation planning for a number of years. Using geographic and census-based data, transportation projects are reviewed as to whether they would significantly alter the demographic characteristics of the community, a neighborhood, or land use. Direct displacement of individuals or families due to a transportation project is also a consideration for both the direct impact on a neighborhood and effects on future travel patterns. Proximity to essential services, such as police, fire, and emergency medical services, is another aspect examined when evaluating transportation facility impacts for mobility and access objectives. Demographic characteristics of the Quad Cities MPA are shown by race, ethnicity, and income in Maps 1.2, 1.3, and 1.4 in Chapter 1. These maps are later used in this plan to illustrate projects in relation to these populations, and provide information for decision-making where impacts can be assessed. Maps 1.9 and 1.10 in Chapter 1 illustrate locations of vulnerable populations in relation to major employers, and essential services, respectively. Map 1.7 in Chapter 1 displays future land use proposed within the Quad Cities MPA. Existing land use is illustrated in Map 1.6 and was obtained from parcel level data (2015) from cities, townships, and counties within the MPA.

Title VI and Limited English Proficiency

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving federal financial assistance. When evaluating transportation projects, consideration should be given to identifying and addressing, as appropriate, disproportionately high and adverse effects on minority and low-income populations. Residential data for low-income and

⁴ planning.org/policy



minority populations have been evaluated to ensure the benefits and burdens of transportation projects will be fairly distributed through 2050. Ongoing efforts should be made by state agencies, local governments, and transit systems to ensure planning processes are inclusive, and low-income, minority, and Limited English Proficiency (LEP) individuals have the opportunity to engage in project development, can access language assistance resources, and are able to express their transportation needs. A LEP analysis outlining demographic data and language assistance measures currently being executed by Quad Cities MPA transit systems is included in Appendix C.

Appendix C provides an environmental justice analysis identifying how proposed projects in the Quad Cities MPA may affect low income and minority individuals and/or areas where there is limited English proficiency. The goal is to avoid and/or minimize inequitable transportation impacts for underserved populations, which may include low-income, minorities, and LEP individuals. Appendix C includes Maps C 1-12 identifying where the underserved populations reside in relation to existing and proposed facilities, such as roads, the routes offered by fixed-route public transportation systems, trails, and sidewalks throughout the Quad Cities MPA. With equitable access to these transportation facilities, underserved populations may have the ability to find further accessibility and resources to commute to work, take children to daycare services, and complete weekly shopping routines such as trips to the grocery store.

Safety, Operations, and Security

Throughout Bi-State Regional Commission's 55 years as a Metropolitan Planning Organization (MPO), safety, operations, and security have been important aspects of transportation planning for the Quad Cities MPA. The MPA has prepared intersection crash reports, conducted crash analyses, and participated in interdisciplinary safety and security efforts between two states, two counties, and multiple municipalities as well as a federal military installation, the Rock Island Arsenal. These safety and security-related activities will continue to be important aspects of the transportation planning process in the future.

As new operational technologies have been deployed, such as traffic dynamic message signs, traffic cameras, and state traffic operations centers with traveler information, the Quad Cities has planned for the

U.S. Department of Transportation Automation Principles

- Safety priority
- Technology neutrality
- Regulations modernization
- Regulatory and operational consistency
- Proactive automation preparation
- Freedoms protection and enhancement

Source: U.S. Department of Transportation, <https://www.transportation.gov/av/3>

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Benefits of TSMO – Transportation Systems Management and Operations

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

Types of TSMO Strategies/ Solutions

- Work zone management
- Traffic incident management
- Special event management
- Transit management
- Freight management
- Traveler information
- Ramp management
- Access management
- Improved bicycle and pedestrian crossings

Source: Federal Highway Administration, <https://ops.fhwa.dot.gov/tsmo/>

addition of these technologies with its Intelligent Transportation System Architecture plan. Technology and vehicle operations continue to advance, including how automated vehicles will be integrated into the transportation system. Federal Highway Administration (FHWA) released *Preparing for the Future of Transportation: Automated Vehicles 3.0* (2018) that focused on three important elements: advancing multi-modal safety, reducing policy uncertainty, and outlining a process for working with the U.S. Department of Transportation. The MPO will monitor advances in this area to facilitate preparedness for future deployment in the Quad Cities.

Transportation System Management (TSM)

The Federal Highway Administration, in September 1975, set forth a short-to-intermediate range planning process taking into consideration a broad range of factors not previously covered directly in the transportation planning process. In 1977, Bi-State Metropolitan Planning Commission, now known as Bi-State Regional Commission, developed a Transportation Systems Management (TSM) Plan for the Iowa-Illinois Quad Cities. The TSM was required by the Urban Mass Transit Administration.

The goal for the TSM planning process was to “maximize the operational efficiency of the existing transportation system through the implementation of short and intermediate range, low capital intensive improvements, which are consistent with the long-range transportation plan.” Today, the transportation systems management and operations (TSMO), and the Congestion Management Process (CMP) takes the place of the TSM.

Transportation Systems Management and Operations (TSMO)

Transportation systems management and operations is a set of strategies to get the most performance from the existing transportation system at a relatively low cost. These strategies aim to balance supply and demand on the system and match solutions to the changing conditions. TSMO is a holistic examination of multiple modes and cross-jurisdictional relationships to achieve seamless interoperability. Many jurisdictions are utilizing a number of these strategies and solutions to address recurring and non-recurring congestion. Federal Highway Administration notes utilization of TSMO practices can be an alternative to addressing growing travel demand by adding lanes,



new facilities, or to address physical constraints. It is another tool in the tool box for supporting mobility and connectivity.

Congestion Management Plan (CMP)

As outlined in a technical addendum to the long range plan, the CMP activities involve local engineers and planners as they consider ways to mitigate congestion on the transportation network. Some CMP strategies may add capacity through additional lanes or new facilities to relieve congestion. However, as just noted, operations management and maintenance activities may relieve congestion. These types of improvements are not listed separately in the plan but are a component to optimizing travel demand.

Congestion relief plays an important role in plan preparation as part of the Surface Transportation Block Grant (STBG) Program evaluation process adopted by the Quad Cities MPO Transportation Policy Committee, a delegated authority by the Bi-State Regional Commission to plan and program federal transportation funding. The technical evaluation criteria weighs heavily on factors affecting congestion, and the process has been set as an example throughout the United States.

Safety criteria is another component of the project prioritization process for federal-aid STBG funds (under the FAST Act, these funds are renamed Surface Transportation Block Grant Program funds).

In 1991, through the Iowa Governor's Traffic Safety Bureau, an interdisciplinary traffic safety group was formed in the Iowa Quad Cities within Scott County, Iowa. The Community Awareness of Roadway Safety (CARS) Group has been working over the past 25 years on all facets of traffic safety, ranging from work zone enforcement, seat belt utilization, child safety seat usage, red light running, crash location reductions, river crossing safety/security coordination, incident management, evacuation planning, congestion management, and low clearance bridge crashes to bicycle and pedestrian safety. CARS has implemented, working with the Departments of Transportation, 1/10th interstate mile markers identifying east and west to allow law enforcement to determine whether incidents are located in one state or another at the I-74 Mississippi River crossing. The group has also played an important role in the deployment of dynamic message signs and the intergovernmental agreements needed among multiple jurisdictions (federal, state, and local).

15th Street Rock Island, Iowa Bound Congestion



Source: Bi-State Regional Commission

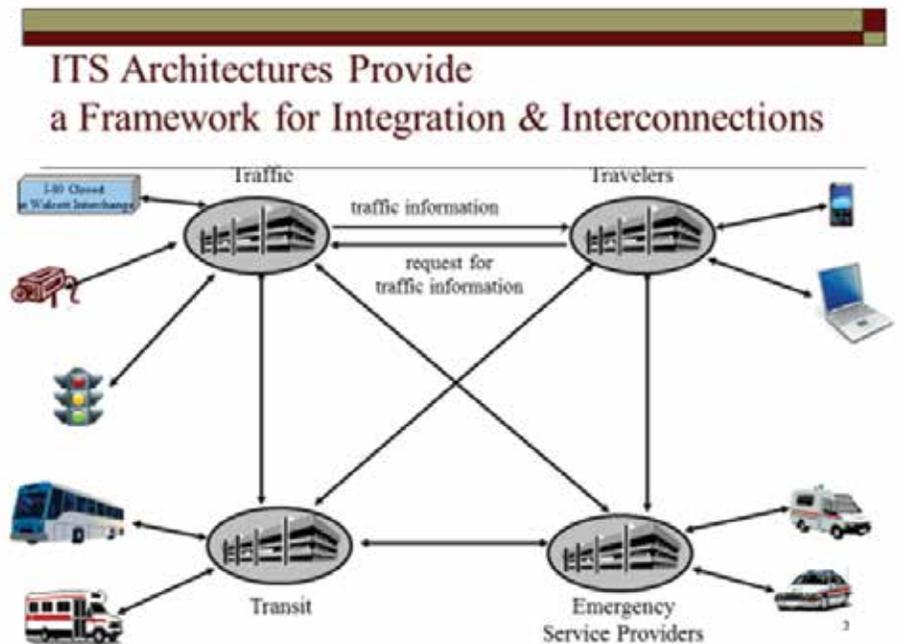
System Planning Considerations



Intelligent Transportation Systems (ITS)

Annually, Bi-State Regional Commission hosts a joint Iowa-Illinois traffic safety and operations meeting with the CARS group and interdisciplinary interests (planners, engineers, transit representatives, public works personnel, law enforcement, and emergency responders) from the Illinois Quad Cities. The group discusses logistics of hosting a bi-state running marathon that utilizes a Mississippi River crossing at Interstate 74, among other issues. These interdisciplinary representatives from both states also helped provide input for the original *Bi-State Regional Intelligent Transportation System (ITS) Architecture Plan* completed in April 2005, and subsequently updated. This joint group was also instrumental in forming a steering committee to conduct an Early Warning Incident Management Feasibility Study (Bridge Incident Management Response System-BIMRS) to improve first response and early warning safety on the narrow, four-lane I-74 bridges (twin spans) across the Mississippi River. Figure 2.7 diagrams the components of a sample Intelligent Transportation System (ITS) architecture.

Figure 2.7 Diagram Of Intelligent Transportation System Framework



Source: Bi-State Regional Commission 2013



The use of ITS and services will be considered throughout the planning area. ITS encompasses a wide variety of tools and techniques that focus on addressing transportation problems by improving the efficiency of the existing transportation infrastructure, as discussed in Chapter 4. These transportation improvements are done through the application of communications, computing, information, and other advanced technologies. Some examples of ITS technologies operating presently in the planning area include permanent and mobile dynamic message signs, red light running and speed cameras, electronic traffic signalization, and automated vehicle locator systems on transit buses.

Both the Iowa and Illinois Departments of Transportation (DOT) have prepared statewide ITS plans that identify the need for advanced technologies to be considered in the I-74 corridor, followed by deployment for the entire Quad Cities MPA. The *Bi-State Regional Intelligent Transportation System (ITS) Architecture Plan* complements the statewide plans and further details deployment of ITS technologies in the Quad Cities MPA. ITS applications in the planning area and statewide will assist in reducing delays, preventing accidents, increasing incident response, providing traveler options, and improving the efficiency of fuel consumption.

To date, traffic cameras are part of the I-74 and Centennial bridges to allow the local and state law enforcement to better respond to incidents on these bridges. The I-74 bridge carries 69,700 (2019) vehicles per day. The I-74 Mississippi River Corridor Environmental Impact Statement indicated crashes were three times higher than the national average. The I-74 Mississippi River Corridor reconstruction, currently nearing completion, is anticipated to reduce bridge crashes on and near the structure once completed. Implementation of the BIMRS study elements, such as the traffic cameras among other plans, has been important prior to the bridges' replacement. Through Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the Quad Cities MPA secured \$85 million in federal transportation funds to complete engineering for the bridge replacement project and ready the project for construction. Subsequent transportation acts have funded the final elements to complete the new bridge and corridor improvements.

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Rock Island County Sheriff's Department Emergency Response Vehicles



Source: Rock Island County Sheriff's Department

Medic EMS Ambulance



Source: Medic EMS

Coordination of intergovernmental relationships and agreements was completed in advance of major reconstruction of the I-74 Mississippi River crossing and implementation of BIMRS, and in advance of emergency response situations in the Quad Cities MPA. An I-74 Mississippi River Corridor project-level ITS Architecture and incident management plan is in use for the completion bridge. A similar effort will be necessary for the replacement of the I-80 bridge and consideration of improvements along the I-80 corridor.

As ITS communications and operational capabilities continue to develop, they will likely become more integrated into emergency response and thus, should be included in the planning mentioned below. Additionally, ITS-specific plans and procedures may need to be incorporated into project designs. These new plans and agreements may benefit from the planning foundation that already exists in the public safety arena.

Emergency Management

Transportation safety and security efforts are closely connected with the recent trend of formal planning in the police, fire, emergency management services, and public works sectors. Under federal and state regulations initiated after the September 11, 2001 terrorist attacks and the Hurricane Katrina Disaster, formal planning and operating procedures have become requirements for nearly every emergency response agency at the federal, state, and local level. These planning initiatives include adopting and training for the National Incident Management System (NIMS), which provides a frame work for incident response that is used by emergency response agencies. Other federally and/or state-mandated planning requirements include interoperable communication plans that identify the emergency communications inventory and interconnectivity in a region. These plans also show how regional agencies should communicate with federal and state agencies in a joint response. In the Bi-State Region, all agencies are NIMS compliant, and many agencies have participated in an interoperable communications plan, and deployment.

Another important component to transportation security and safety includes establishing formal and informal mutual aid agreements among emergency response agencies. Mutual aid agreements generally state that nearby agencies will provide assistance to each other



as requested, so long as such assistance does not jeopardize their ability to serve citizens in their primary area of operations. Often, these agreements state that agencies will not charge each other for assistance or set a nominal reimbursement arrangement. There are numerous agreements of this type in place across the Bi-State Region.

Federal Performance Management

In Moving Ahead for Progress in the 21st Century Act (MAP-21), the USDOT instituted performance-based measures and reinforced in the Fixing America's Surface Transportation (FAST) Act. Their emphasis is on system safety, asset management, and efficiency. National performance goals were established, and required each state or public transit system to implement relevant, reliable, and measurable metrics that can illustrate trending by setting individual targets. These goals, broad statements of desired outcomes, are being integrated into the state and transit systems' processes of identifying needed transportation improvements and project selection. The MPO has supported both Iowa and Illinois targets for safety, road and bridge assets, and system reliability, as well as the three fixed route public transit systems' targets on transit safety and assets.

Federal Performance Management Goals

According to FAST and summarized by the Federal Highway Administration (FHWA), national performance goals are the following:

- **Safety** – To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- **Infrastructure condition** – To maintain the highway infrastructure asset system in a state of good repair
- **Congestion reduction** – To achieve a significant reduction in congestion on the National Highway System (NHS)
- **System reliability** – To improve the efficiency of the surface transportation system
- **Freight movement and economic vitality** – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development

Pot Holes, 20th Street, Rock Island



Source: Bi-State Regional Commission

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- **Environmental sustainability** – To enhance the performance of the transportation system while protecting and enhancing the natural environment
- **Reduced project delivery delays** – To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agency work practices

In addition to the Federal Highway Administration's (FHWA) national performance goals, the Federal Transit Administration (FTA) has also developed performance measures relating to the following themes:

- **Transit Asset Management** – To assist transit agencies with maintaining buses and rail systems in a State of Good Repair (SGR) and to preserve and expand transit investments
- **Transit Safety** – To prevent public transportation accidents by integrating safety into all aspects of a transit system's activities

Each state was given one year from the USDOT final ruling to finalize and adopt their set of performance targets in support of those measures. States are required to integrate the performance measures identified by FHWA but are allowed to establish that additional performance measures be trended as well. States will invest resources to achieve individual targets that will collectively make progress toward national goals. Once the state finalized their targets, each Metropolitan Planning Organization (MPO) has 180 days to set performance targets in relation to the performance measures of their own or support the state ones. Coordination among state departments of transportation, MPOs, and relevant public transportation providers is necessary when setting targets in order to ensure consistency to the maximum extent possible. State and MPO targets (if developed) should be included in the Statewide Transportation Plan. The implemented performance measures under MAP-21/FAST increase accountability and transparency of the federal-aid highway program and improve project decision making.

Road safety targets address number of fatalities, fatality rate, number of serious injuries, serious injury rate, and non-motorized fatalities and serious injuries on all roads, including non-federally classified roads. Transit safety includes measures of number of fatalities, num-



ber of injuries, and both a fatality and an injury rate per total vehicle revenue miles. Transit safety measures also include safety events and system reliability.

Performance measures for asset management for roads and bridges focus on the interstate system, and non-interstate National Highway System (NHS) in good or poor condition. They also look at percentage of interstate and non-interstate NHS percentage of person-miles traveled that are reliable, and the truck travel time reliability (TTTR) index.

The Quad Cities MPO has supported the respective Iowa and Illinois states' and Bettendorf Transit, CitiBus, and MetroLINK transit systems' targets. The Quad Cities MPO performance measures technical addendum to this plan provides a compilation of the most recent targets and outlines the federal performance measures program more fully. It is intended to be updated periodically, and support of the states' and transit systems targets are taken to the Transportation Policy Committee based on the cycle of required target-setting at the state and transit system level.

Other Ways to Support Performance Management

While there are a number of federally prescribed performance measures for transportation system performance management, it is recognized that assessing other activities will aid in performance progress for the metropolitan area. What does "support" mean? For safety, the MPO has produced a *Quad Cities Strategic Highway Safety Plan (2021)* for local jurisdictions to use to identify crash hot spots or corridors where either engineering, enforcement, emergency response or education may be applied. The plan outlines emphasis areas where crash reductions efforts can be focused. The federal safety goal applies to all roads, and the local traffic safety plan will be useful in determining crash reduction priorities to reduce fatalities and serious injuries. The MPO participates in a long-standing Community Awareness of Roadway Safety (CARS) group that meets regularly to discuss traffic safety and coordination. Group discussions between the DOTs and local officials on proactive solutions to higher crash density corridors or hot spots will help bring projects forward as priorities, and toward implementation. Improvement at intersections and within corridors where transit routes occur will also aid

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transit traffic safety. For road improvements, the MPO has an established STBG programming process to evaluate projects based on safety, congestion, and pavement conditions. Safety is recognized in the ranking of projects.

For condition and reliability, local jurisdictions may cooperate on projects that are within their respective jurisdiction, and on the non-interstate NHS routes. The MPO also supports local governments in the metro area with grant applications for planning and constructions funds or provides data in to help justify funding applications. The recent Extreme Weather Resilience report will help identify areas where travel disruptions may occur due to extreme weather and inform decision-making when improvements are planned for the NHS system.

System preservation is another transportation objective of this plan. For roads and bridges, the MPO's STBG programming process uses condition data to evaluate projects applying for this specific funding source within the metro area. System preservation is emphasized over project expansion in the rating criteria.

The items noted above support the federal performance management system, as well as this plan's transportation objectives that are outlined in Chapter 1, including:

- Increase accessibility and mobility options
- Increase transportation safety
- Emphasize system preservation
- Engage in efficient system management and operation
- Enhance connectivity and integration between modes
- Protect and enhance the environment
- Support economic vitality
- Increase security
- Address system resilience