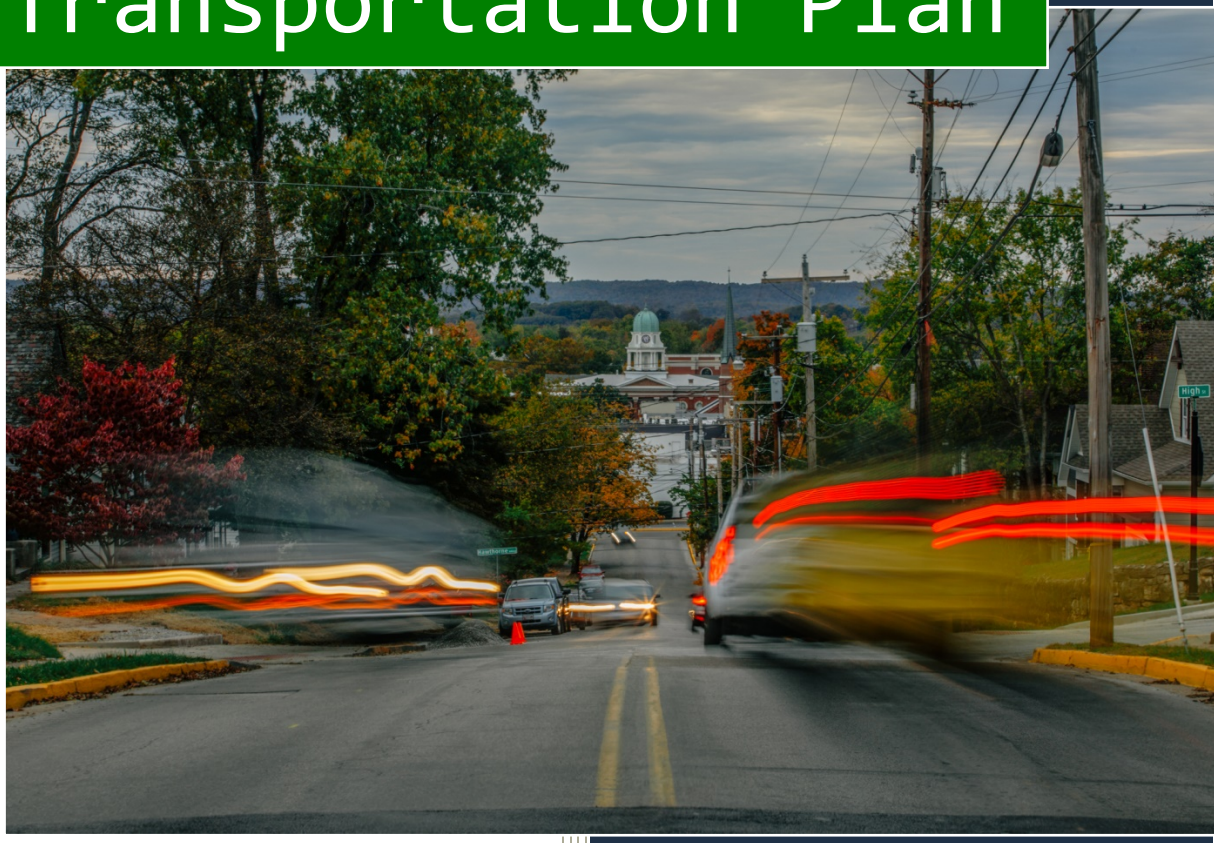
BOWLING GREEN & WARREN COUNTY
Metropolitan Planning Organization

2045

Metropolitan Transportation Plan



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2045 METROPOLITAN TRANSPORTATION PLAN EXECUTIVE SUMMARY

INTRODUCTION

Transportation is the means of moving people and goods from one location to another in order to carry out the daily needs and desires of life. People and goods transport in various ways – from trains and planes to automobiles, scooters, buses, bicycles, and walking. Transportation shapes the identity of communities as it affects the movement of people and goods, and in turn affects how people engage with the world around them. Our transportation systems equip us to utilize community services, commodities, and various amenities. Planning and investing in sustainable transportation systems that provide opportunities for all people to access the necessities of everyday life is the foundation for the future of our community.

The purpose of this Metropolitan Transportation Plan (MTP) is to identify the existing and proposed transportation facilities and services that are necessary to meet the transportation needs of Bowling Green and Warren County by the year 2045.

The MPO developed the nine goals and corresponding objectives for Bowling Green and Warren County. These goals and objectives set the direction for the priorities established in the 2045 MTP and provide a foundation in which the MPO and community partners can work to improve the transportation system.

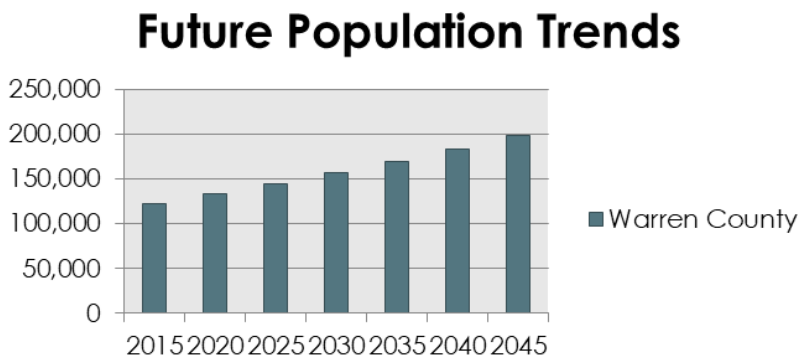
WHAT'S INCLUDED

People and Place

The 2045 MTP acknowledges the growing and ever-changing transportation trends emerging across America and the world – from self-driving cars and bike-shares to curbside management and delivery vehicles. While these trends are uncertain in form, function, and timeline, the MPO acknowledges the need to consider the uncertainties of future transportation when setting priorities through the year 2045.

The characteristics and assets that make up a place shape the demands and needs of its community. Warren County is located within a day's travel of nearly 60 percent of the U.S. population, is home to people from around the world, and serves as a regional hub for over

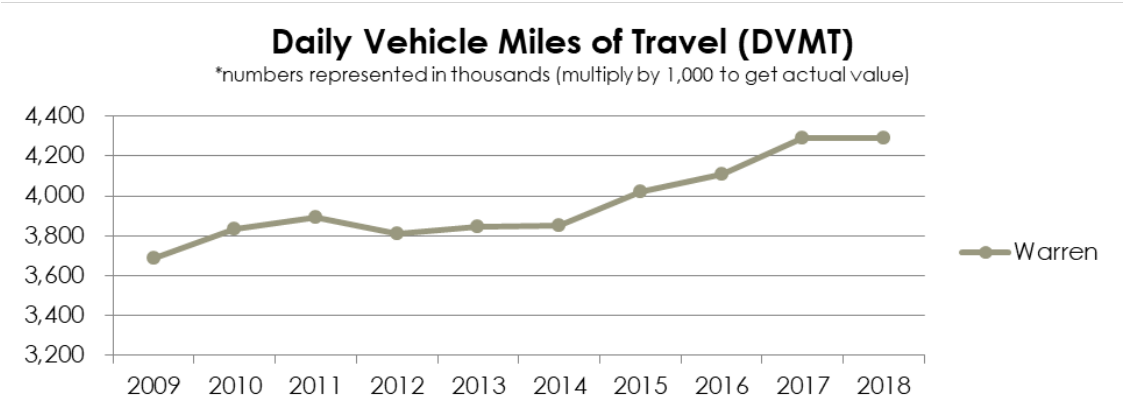
300,000 people living in the 10-county region. **Over a nearly fifty-year period, Warren County experienced a 129% growth in population**; Bowling Green experienced an 89% population growth. By 2045, Warren County's population is expected to reach nearly 198,000.



The ACS 2018 five-year estimates reported that 65% of Warren County's population was employed. Warren County's working labor force represents the diversity of the community, with the foreign born population contributing to the growth and stability of the economy. The Bowling Green Area Chamber of Commerce reported that Warren County is home to 26 international companies, representing 11 different countries. Employment is expected to grow by 74% for all sectors (Non-Retail, Retail, Service) by the year 2045, according to the MPO's travel demand model developed and maintained by the Kentucky Transportation Cabinet.

Existing Features

Not of great surprise, 81.5% of Warren County residents reported driving alone as their primary means of commuting to work. There are over 1,400 miles of public roadways in the MPO area, ranging from interstates, major highways, county roadways, and local city streets. The Kentucky Transportation Cabinet, City of Bowling Green, and Warren County provide all maintenance and operations work on their respective roadways. Over the past ten years, Warren County's roadways have seen a rise in daily vehicle miles traveled, as depicted in the chart below.



Warren County offers an array of bicycle and pedestrian infrastructure. The City of Bowling Green constructs and maintains sidewalks within the city limits on city streets and along state-maintained corridors within the city limits. The City of Bowling Green along with Operation PRIDE maintain greenway trails across the city. The MPO works with its committees and community partners to plan future trails throughout the community. Currently, there are a total of about **47 miles of trails across the county**, as depicted in the table.

Total Trail Mileage in Warren County	Total Miles
Greenway Trail (Paved Shared-Use Path)	23.3
Park System Trail - City (Gravel Path)	5.69
Park System Trail - County (Gravel Path)	15.66
Bike Lanes/Share the Road (County-wide)	2.5
TOTAL MILES	**47.15**

WKU's Topper Transit and the City of Bowling Green's transit system, GO bg, serve the WKU campus community and Bowling Green. Topper Transit has seen a steady rise in ridership over the last ten years, with the 2019 fiscal year coming in at about 700,000 riders. GO bg Transit operates six fixed routes and offers para-transit services.

Future Priorities

Safety for all users is a critical component in planning for the future. Asking ourselves where risks are today, helps guide the development of projects for the future. Many of the proposed priority projects were derived from not only safety issues present today, but mobility and accessibility demands projected for the future. Additionally, the MPO utilized previously completed transportation studies and public comments from the fall 2019 transportation survey to further refine the priority projects. The projects recommended in the plan are divided into short-range projects (2020-2026) and long-range projects (2027-2045). The short-range projects are projects derived from the 2020 State Highway Plan and the FY2019-2024 Transportation Improvement Program (TIP). A financial analysis conducted by KYTC guided the future planning of the projects into projected project year intervals, where year-of-expenditure calculations were made to properly account for project funding. It is estimated that in order to complete all 52 projects listed in the Plan, it will cost approximately $5.4 million (in YOE dollars). It is important to note that the projects listed in this Plan are conceptual; it does not ensure that funding will be allocated, nor does it define the project scope. The MPO does not have jurisdiction over project implementation, but assists its planning partners and the community in effective planning and advisory roles.

Many public comments from fall 2019 identified the desire for more biking and walking infrastructure. This desire and the need for more, and safer, infrastructure is heard by the MPO. While there is limited dedicated funding for greenways, the MPO works with local leaders to incorporate shared-use paths with roadway projects – such as the future US 31W (Nashville Rd) widening between the roundabout and US 231 (Campbell Ln), and the Smallhouse Road widening project between US 231 (Campbell Ln) and Ridgecrest Way. The

City of Bowling Green is committed to constructing more sidewalks and filling in gaps in the existing system, as funding allows. As for future greenway trails, the MPO worked with its Bicycle and Pedestrian Advisory Committee (BPAC) and other local leaders to develop and recommend a loop around the city that would connect existing trails and provide ample opportunity for additional connections. Connectivity and accessibility are two primary focuses of the BPAC in planning for future trails. We've identified a lot of gaps in our existing system and by 2045, hope to fill in many of these gaps.

CONCLUSION

While funding is competitive at both the state and national levels, the projects herein indicate that with the projected revenues through 2045, the MPO has adopted these projects as high priorities for funding. The Bowling Green-Warren County Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) are the official mechanisms through which projects in the MTP are implemented. The MPO will continue to support the goals and objectives listed in this plan, and work with local planning partners toward implementing the projects listed within this Plan.

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1. Introduction

Transportation is the means of moving people and goods from one location to another in order to carry out the daily needs and desires of life. People and goods transport in various ways – from trains and planes to automobiles, buses, bicycles, scooters, and walking. Transportation shapes the identity of communities as it affects the movement of people and goods, and in turn affects how people engage with the world around them. Our transportation systems equip us to utilize community services, commodities, and various amenities. Planning and investing in sustainable transportation systems that provide opportunities for all people to access the necessities of everyday life is the foundation for the future of our community.

With a rapidly growing county and region, our transportation systems must be capable of accommodating the demands incurred from growth and development. Prioritizing projects with limited funding presents challenges in planning for future demands. Innovative tactics and critical transportation projects will rise to greater value as we look to the future.

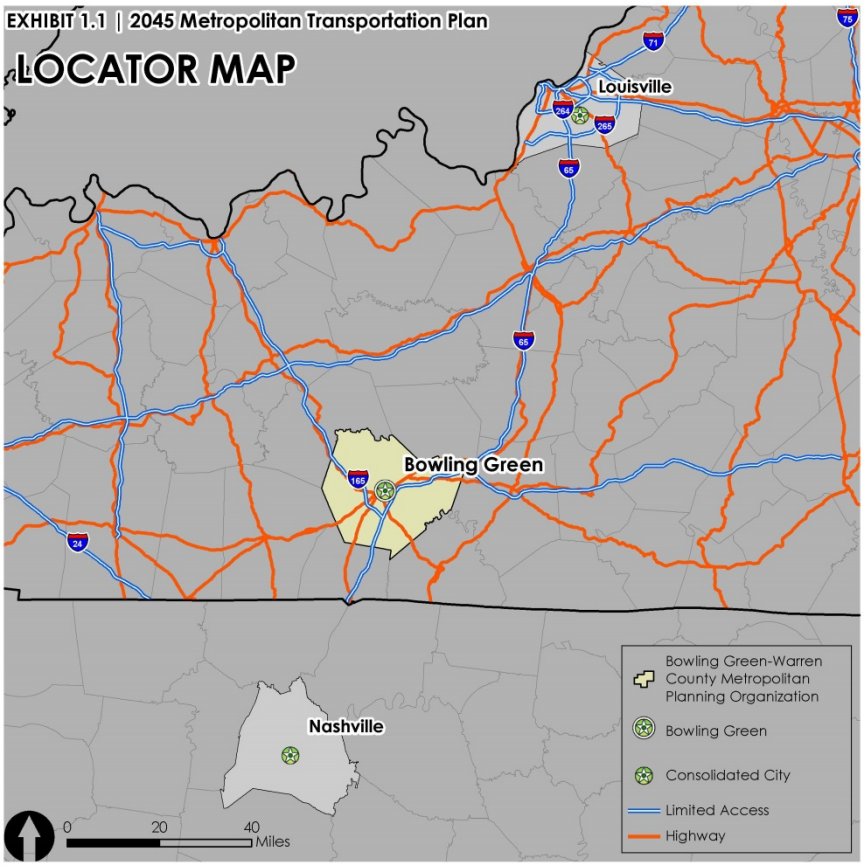
Purpose of the MTP

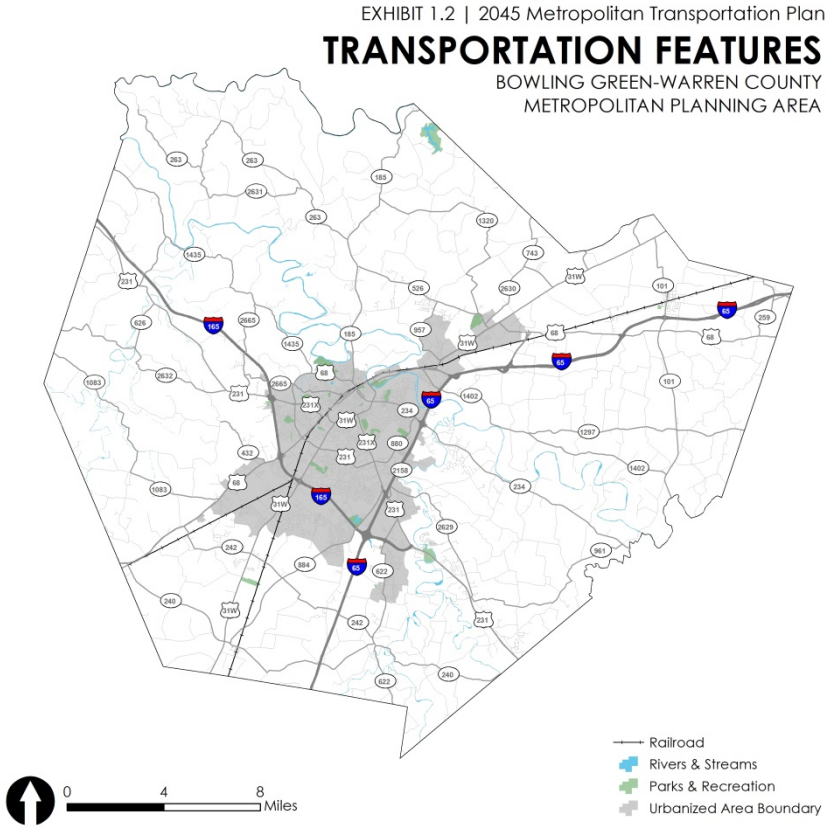
The purpose of this Metropolitan Transportation Plan (MTP) is to identify the existing and proposed transportation facilities and services that are necessary to meet the transportation needs of Bowling Green and Warren County by the year 2045. The recommendations for transportation projects have been shaped by key community issues, transportation goals and initiatives, future land use developments, population trends, and employment patterns. Coordination with public agencies along with input from the public and planning partners have influenced the direction of this plan. Project recommendations have been developed through a prioritization process based on need and availability of funds.

About the MPO

The City of Bowling Green and Warren County are situated on the Barren River in south central Kentucky, approximately 114 miles south of Louisville, Kentucky and approximately 60 miles north of Nashville, Tennessee (see ***Exhibit 1.1***). ***Exhibit 1.2*** represents the base transportation features of Warren County. The MPO planning area encompasses all of Warren County including the cities of Bowling Green, Plum Springs, Oakland, Smiths Grove and Woodburn, and contains approximately 550 square miles (352,000 acres). The region has a rich history, strong community character, a major university, thriving healthcare facilities, and a balanced economic base.

The Bowling Green-Warren County Metropolitan Planning Organization (MPO) was officially established in 2003. THE FEDERAL HIGHWAY ACT OF 1962 requires the formation of a MPO for any urbanized area with a population greater than 50,000. MPOs were created in order to ensure that existing and future expenditures for transportation projects and programs are based on a continuing, comprehensive, and cooperative (3-C) planning process. Federal funding for transportation projects and programs are channeled through this planning process. The MPO serves as a platform for coordination and communication between the public and local, state, and federal agencies in regard to planning issues and transportation topics, plans, programs, and projects. The MPO develops both long- and short-range multimodal transportation plans, selects and approves projects for federal funding based upon regional priorities, and develops methods to improve problematic and unsafe corridors.





The Bowling Green-Warren County MPO is made up of a

Policy Committee (PC), Technical Advisory Committee (TAC), and Bicycle and Pedestrian Advisory Committee (BPAC). The Policy Committee acts as the decision-making body of the MPO, while the TAC and BPAC make planning and programming recommendations that are ultimately acted upon by the PC. Additional information about the MPO committee structure can be found in the PARTICIPATION PLAN on the MPO's website.

The Process

To ensure continuity and to account for changes over time, the MTP must be reviewed and updated at least every five years and cover at least a twenty year period. The Bowling Green-Warren County 2045 MTP is a multi-modal plan covering a 25-year planning period from 2020 to 2045. The MPO's approach to developing the MTP and ongoing transportation planning activities included steps to:

- Establish regional visions, goals, and objectives
- Assess the existing transportation system
- Assess community statistics and demographics
- Evaluate current and future land use trends
- Predict future travel demand
- Assess community needs and desires
- Identify solutions and strategies
- Predict future financial resources
- Develop long-range and short-range investment strategies
- Prioritize and evaluate projects and programs
- Implement the plan and monitor system performance

MTP Approval

The MPO Technical Advisory Committee (TAC) guides the development of the MTP and provides the recommendation for approval to the MPO Policy Committee (PC) for formal adoption of the plan. A copy of the PC Resolution adopting the 2045 MTP is in ***Appendix A***. The MTP is submitted to the Kentucky Transportation Cabinet (KYTC), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) for their review regarding compliance with federal requirements. The MTP is updated every five (5) years and may be amended or modified as required for project programming.

MTP Amendments

Amendments are major revisions to the MTP, such as adding or deleting a significant project or major changes to a project; changes to illustrative projects included in the MTP do not require amendments. Amendments require a 15-day public review and comment period. Notification procedures for MTP amendments are outlined in the PARTICIPATION PLAN.

MTP Modifications

Modifications are minor changes and/or corrections to the MTP, such as changes/corrections to phasing, costs, funding sources, or authorization dates. No public review and comment period is required for an Administrative Modification. Additionally, transportation projects of

the types listed in the Grouped Projects (***Table 6.4*** on page 77) may also be added by an Administrative Modification. Modifications will be posted to the MPO website and distributed to appropriate MPO committees and stakeholder agencies.

Federal Planning Factors

Fixing America's Surface Transportation (FAST) Act

The FAST Act replaced MAP-21 and became law on December 7, 2015. The current law authorizes Federal transportation programs for Federal fiscal year (FFY) 2016 through FFY 2020. Requirements for planning and investing in the nation's surface transportation infrastructure are outlined in the FAST Act, in addition to addressing performance-based goals and measures for states and MPO planning areas. The following factors are considered as the Planning Factors in the FAST Act:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.
- Increase the *safety* of the transportation system for motorized and non-motorized users.
- Increase the *security* of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for freight.
- Protect and enhance the environment, promote energy conservation, improve the quality of life and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.
- Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
- Enhance travel and tourism.

Livability Principles

On June 16, 2009, the U.S. Department of Transportation, U.S. Department of Housing and Urban Development, and the U.S. Environmental Protection Agency inaugurated six "Livability Principles" set forth by an Interagency Partnership for Sustainable Communities. The principles were adopted to help the agencies guide the allocation of funds to communities that manage their financial and physical resources in a manner that creates a dynamic environment that is efficient in its function, livable for its residents, enduring in its viability and results in a sense of well-being of its citizens. The principles are:

1. **Provide more transportation choices |** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.

2. **Promote equitable, affordable housing |** Expand location- and energy-efficient housing for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.
3. **Enhance economic competitiveness |** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers as well as expanded business access to markets.
4. **Support existing communities |** Target federal funding toward existing communities – through such strategies as transit-oriented development, mixed-use development and land recycling – to increase community revitalization, improve the efficiency of public works investments, and safeguard rural landscapes.
5. **Coordinate and leverage federal policies and investment |** Align federal policies and funding to remove barriers to collaboration, leverage funding and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.
6. **Value communities and neighborhoods |** Support the growth of healthy, safe and walkable neighborhoods that encourage community involvement and enhance the natural characteristics of the community.

2045 MTP Goals & Objectives

Through public input and the direction of the FAST Act goals, planning factors, and emphasis areas, the MPO developed the following goals and objectives for Bowling Green and Warren County. These goals and objectives set the direction for the priorities established in this plan and provide a foundation in which the MPO and community partners can work to improve the transportation system. The goals and objectives listed below are intended to enhance the transportation system for all users, regardless of travel mode, for both citizen and visitor alike. Each goal is supported by several objectives, which further define the desired outcomes of the plan. The MTP was developed in alignment with these goals and objectives.

Goals & Objectives

1. **Improve mobility**
   - 1.1. Manage congestion and improve travel time reliability within the transportation system.
   - 1.2. Expand capacity by addressing intersection bottlenecks and peak hour traffic delays.
   - 1.3. Accommodate the implementation of new types of vehicles, fuels, modes of transportation, and logistics practices.
   - 1.4. Support reliable and efficient movement of goods and freight into and out of the region via roadways, railways, air, and other future modes.
2. **Provide access and options**
   - 2.1. Invest in various travel modes, tools, and technologies that improve accessibility for all transportation users, regardless of mode.
   - 2.2. Promote investments that provide access to, between, and beyond the Bowling Green region.
   - 2.3. Ensure access to jobs, education, goods, and services for all residents.
3. **Provide connectivity within and between modes**

3.1. Identify gaps in and between transportation modes and seek to remove barriers to travel for all modes.
3.2. Invest in infrastructure improvements that increase connectivity of streets, sidewalks, greenways/bikeways and transit service.

4. **Improve overall safety**
   4.1. Encourage design features that minimize crash potential, severity, and frequency.
   4.2. Reduce the number of injuries and fatalities by identifying hazards and conflicts within and between modes; support the implementation of safety improvements.
5. **Preserve existing infrastructure with efficiency and reliability**
   5.1. Support maintenance of existing infrastructure for all modes of travel.
   5.2. Support alternative infrastructure funding mechanisms to accommodate growing transportation demands and the use of electric vehicles.
   5.3. Encourage maintenance practices and/or improvements within existing right-of-way that promote travel efficiencies and improve travel time reliability.
   5.4. Encourage implementation of operational and management strategies that will help improve the performance of existing transportation facilities.
6. **Support economic vitality and competiveness**
   6.1. Encourage the development of transportation projects that enhance the local and regional economies.
   6.2. Foster innovative financing and partnership opportunities for project development and implementation.
   6.3. Support the maintenance and development of transportation options to promote and maximize regional tourism.
7. **Support environmental stewardship**
   7.1. Develop transportation systems and programs that maintain or improve air quality, water quality, energy conservation, safety, and health outcomes.
   7.2. Encourage sustainable practices to preserve the natural, cultural, and historic resources.
   7.3. Promote transportation projects and initiatives that minimize neighborhood disruption and related impacts.
   7.4. Consider the impact of transportation investments on the environment, including stormwater impacts.
8. **Support health and wellness**
   8.1. Provide support for alternative modes of transportation, such as bicycle, pedestrian, and transit facilities, that provide options to the use of single-occupancy commutes and encourage active lifestyle practices.
   8.2. Consider the health and quality of life repercussions of transportation projects in the planning process.
9. **Support coordination and collaboration amongst local, regional, and state agencies**
   9.1. Coordinate land use, urban design, transportation, transit, and other planning activities to make travel more efficient, secure, and accessible for all users, and provide resiliency in the transportation system.
   9.2. Ensure regular communication with agencies and organizations whose work impacts or is impacted by the transportation system.
   9.3. Work collaboratively with planning partners to evaluate future transportation trends and how to accommodate and equip the community and its infrastructure.

9.4. Communicate transportation plans with community partners to ensure future projects and initiatives are consistent with one another.
9.5. Encourage land use strategies that include safe and efficient access and encourage walkable, bike-friendly, and transit-oriented developments.

Transportation Trends

There are many uncertainties for the future of transportation and with that comes a lot of unanswered questions. With a mere century of widespread public ownership of the automobile, our world is faced with myriad challenges from funding infrastructure projects and drafting safety standards for autonomous vehicles, to incorporating active modes of travel and thinking beyond the realm of the actual roadway. As urbanized areas are increasingly becoming more populated, our transportation systems will be evermore congested and require more frequent maintenance. The need to explore investment strategies that will improve safety, enhance mobility, provide reliable travel times, and expand alternative transportation options, are crucial when setting the framework for the future.

Today, tech companies all over the world are developing new technologies that are transforming the ways people travel and in turn will affect land use patterns, productivity levels, and human behavior on the whole. While many of these emerging technologies are promising to improve transportation for future generations, the actual impact they will have on our individual lives and on our communities is difficult to foresee at this point. Popular topics among the planning field regarding future mobility are geared toward curbside management, shared mobility, and mobility as a service. These topics further explore how communities might manage shared public spaces, like public streets, varying transportation modes, and the future of mobility options.

Despite the uncertainty and ambiguity of future transportation trends, the MPO recognizes the need to plan for and explore the incorporation of emerging technologies into this plan for the future of our transportation system. The following are a few of the emerging technologies that are gaining traction in the future of transportation. Many seek to improve efficiencies, productivity, safety, equity, and sustainability efforts.

- **ITS technologies |** Intelligent Transportation Systems (ITS) technologies enable various technological mediums to communicate information to and between roadway users and transportation infrastructure. This includes vehicle-to-vehicle and vehicle-to-roadside wireless communications (connected vehicle technology). These efforts provide real-time information for roadway users and traffic operations alike. ITS aim to improve traffic safety, relieve traffic congestion, reduce air pollution, increase energy efficiency, among other objectives. ITS technology currently exists in several forms including changeable message roadway signing and advanced traffic signal systems.
- **Autonomous vehicles |** There are multiple levels of vehicle automation (*Figure 1.1*), as classified by the Society of Automotive Engineers and adopted by the US Department of Transportation. There are mixed reviews and expectations of how soon deployment

of autonomous vehicles (AVs) will hit the streets for the myriad of mobility uses. Many experts state that AVs will provide safety improvements for traveling motorists, while improving travel times, productivity levels, and convenience. Others argue that AVs will crowd already congested roadways, cause additional mobility issues, provoke major safety hazards for pedestrians and bicyclists, and further challenge infrastructure funding.

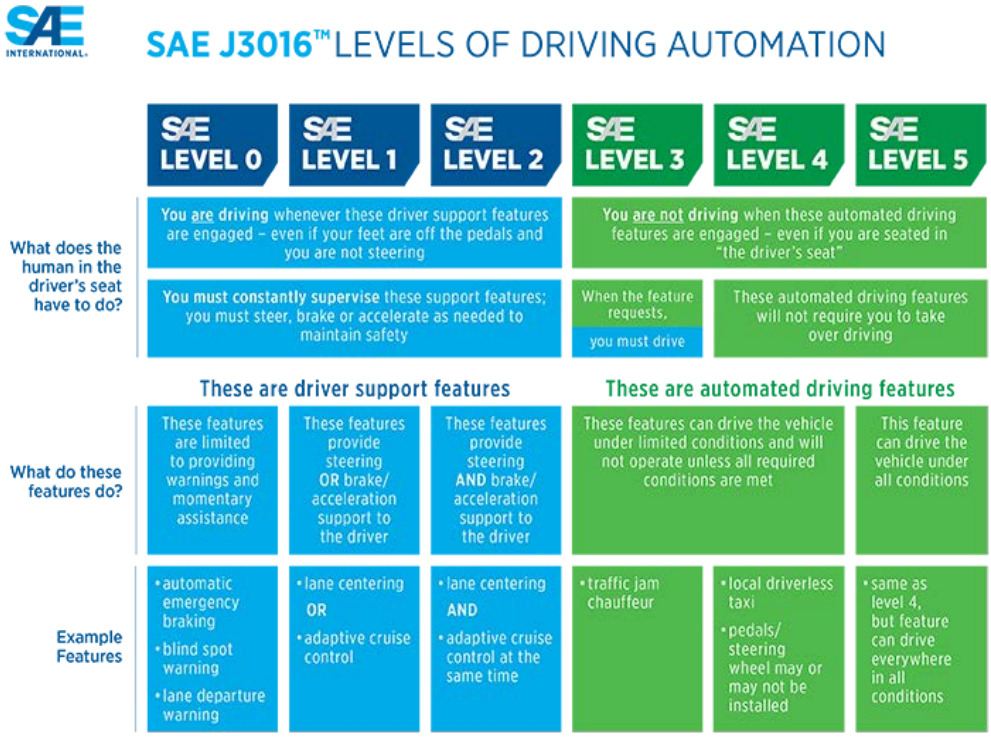


FIGURE 1.1 LEVELS OF AUTOMATION

- **Curbside management |** Curb space availability and management are becoming increasingly more important with the growth of online shopping and associated deliveries; curbside pickups and drop-offs; ride-share services like Uber, Lyft, e-bikes, and e-scooters; and for downtowns, the growing demand of curbside cafes, street fairs, and overall shared public spaces with local businesses.[1]
- **Delivery vehicles |** Commercial and personal deliveries are on the rise with the overwhelming growth of e-commerce. Consumer behavior is changing the way goods are produced, delivered, and purchased; therefore affecting brick-and-mortar stores and consumer travel patterns. Growing automated technologies are exploring the development and deployment of robot-like delivery services. Some companies are exploring various forms of robots to offer front-door and last-mile package

[1] https://www.ite.org/technical-resources/topics/complete-streets/curbside-management-resources/

https://www.parking-mobility.org/2019/05/06/curbside-management-managing-access-to-a-valuable-resource/

deliveries, while other companies are exploring the use of drones. Regardless of the delivery method, transportation for the growing deliveries spurred by e-commerce will require innovative strategies to keep up with consumer demands.

- **Shared mobility |** Shared mobility today, ranges from e-bikes and e-scooters to ride-share services like Uber and Lyft. Shared mobility allows people the flexibility to travel without personal ownership of a transportation mode, whether at home or while traveling to new places. These shared mobility services are often contentious topics with the use of public right-of-way and how to manage those spaces (see curbside management). While these transport modes may be a trend for today, it is uncertain how sustainable they will be in the years to come.

Artificial Intelligence / Automation

Many of the transportation trends previously discussed are geared around automation and artificial intelligence (AI). Technology is rapidly changing and current trends are being refined. It is expected that automation/AI will transform much of our society – how we work and travel – in turn influencing our transportation network. THE MAP below, produced in 2017 by the Institute for Spatial Economic Analysis at the University of Redlands, explores where jobs will be most threatened by automation. The Bowling Green metro area is projected to be at high-risk for job loss from automation.

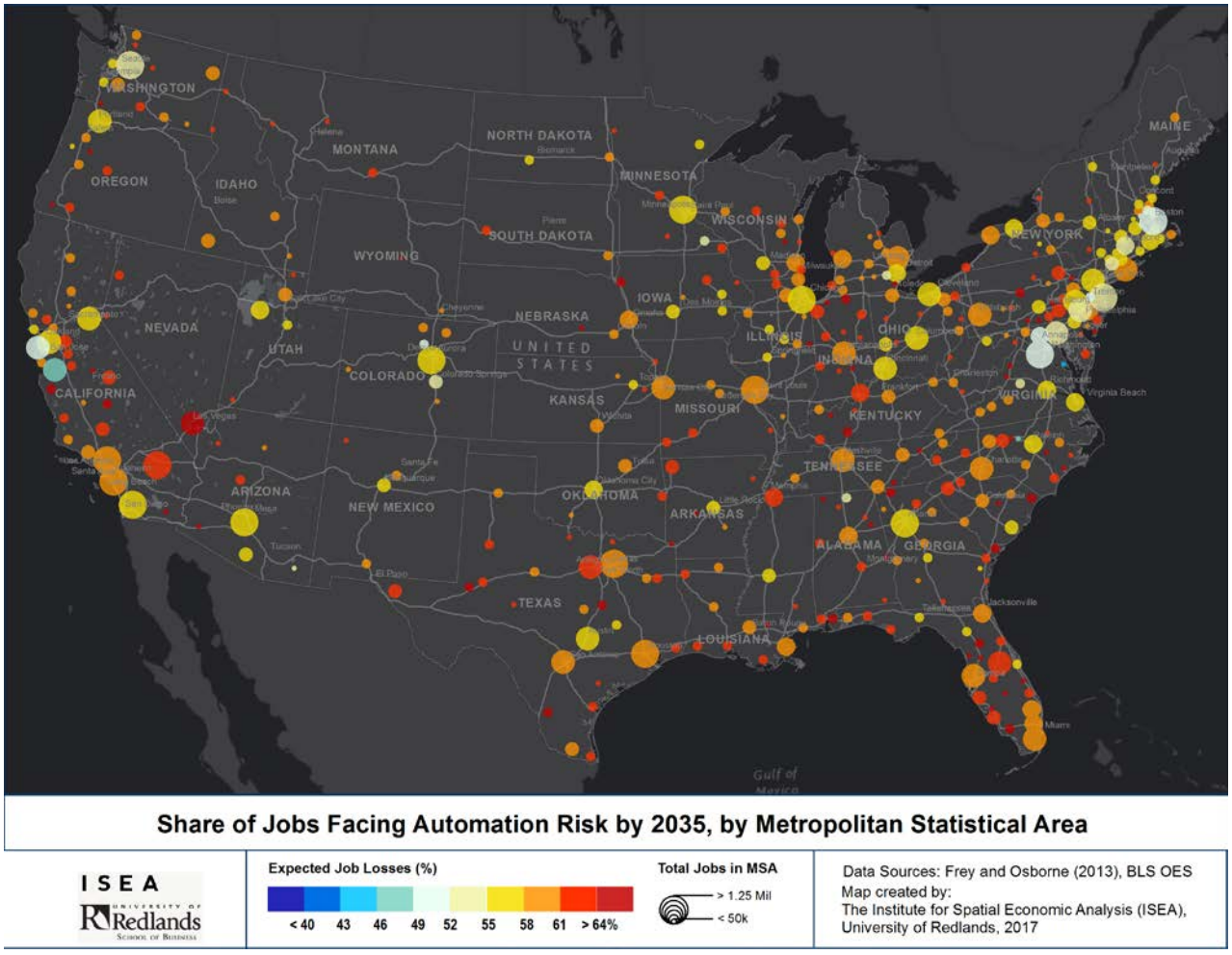


FIGURE 1.2 JOB LOSS INCURRED BY AUTOMATION

The chapter to follow explores the past growth trends of Warren County and projected growth for the future. Warren County is rapidly growing, but from the perspective of the map above, it is also projected to experience significant job loss by 2035. Undoubtedly, the transportation system would be affected as less people are needed for work and therefore less commuters will crowd the streets. Should automation/AI influence the working economy in Warren County, the projected growth trends would likely spur downward. It is imperative for local planners and community leaders to consider these juxtaposing views projected for the future of our county as technological advances continue to transform our communities and transportation system.

2. Socioeconomic Characteristics

The boundary of Warren County delineates the Bowling Green-Warren County MPO Planning Area and consists of a nearly 550 square-mile area which includes the cities of Bowling Green, Oakland, Plums Springs, Smiths Grove, and Woodburn. Understanding the existing conditions and future trends of the socioeconomic characteristics in Warren County helps identify needs, deficiencies, and areas to focus development efforts. These efforts help shape the transportation plans and priorities for the MPO area. For an extensive overview of Warren County's socioeconomic profile, please follow *this* link.

PLACE

Bowling Green is located 60 miles north of Nashville, Tennessee and about 114 miles south of Louisville, Kentucky off Interstate-65. It is the third-most populous city in the state of Kentucky and Warren County is second to Scott County as the fastest growing county in the state, according to 2018 data. Bowling Green is a regional hub for business, education, industry, health care, and entertainment, serving more than 300,000 people in the 10 county region. It is located within a day's travel of nearly 60 percent of the U.S. population and is home to people from around the world. Several major industries call Warren County home – GM Corvette, Houchens Industries, Fruit of the Loom, Camping World, Holley Performance Products, Trace Die Cast, and more.

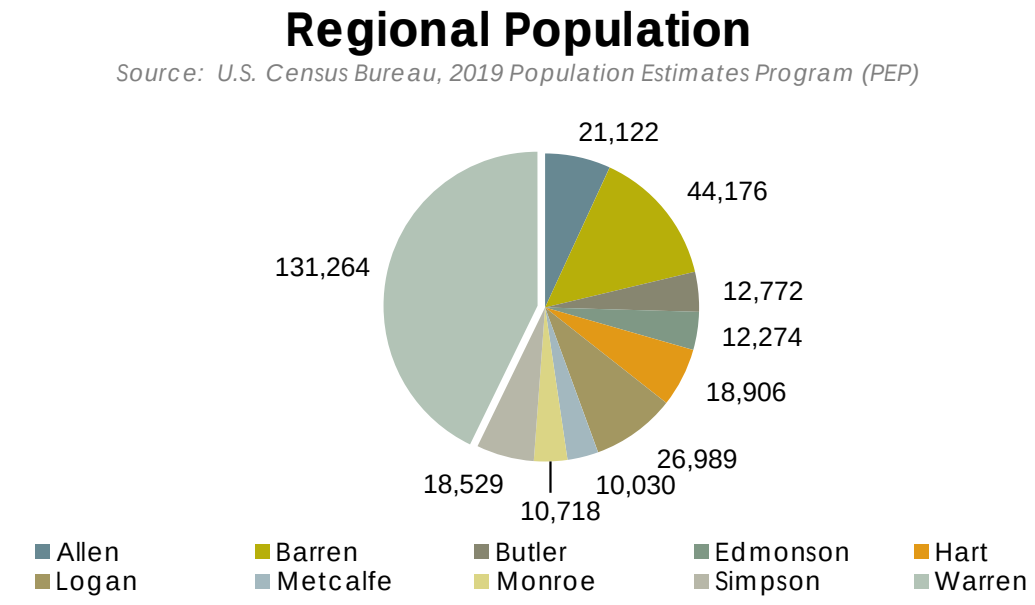


FIGURE 2.1 BARREN RIVER ADD POPULATION DISTRIBUTION

PEOPLE

Warren County is home to a growing and diverse population. With two primary school systems, a public university, community college, International Center, and an array of businesses and industries, Warren County attracts people of all ages and demographics. Understanding who lives in the community and analyzing trends helps identify future needs. The commuting pattern of the Bowling Green-Warren County MPO area is affected by the people who live here. The worker characteristics, the time and convenience of various modes of commuting, and the supply and location of jobs, housing, and community services all contribute to travel demand.

Population Trends

As illustrated by ***Figure 2.2***, the Bowling Green-Warren County MPO area has experienced moderate but steady population growth in the past five decades. Over a nearly fifty-year period, Warren County experienced a 129% growth in population; Bowling Green experienced an 89% population growth. By 2045, Warren County's population is expected to reach nearly 198,000, according to projections provided by the Kentucky State Data Center. The tables and graphs below depict the county's population growth and future trends. Further, the exhibits on the following pages show how this growth is projected to be distributed throughout the traffic analysis zones of the MPO's travel demand model.

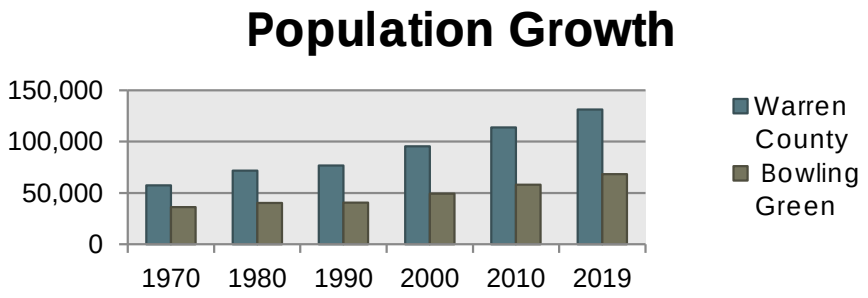


FIGURE 2.2 | POPULATION CHANGE, 1970-2019 | SOURCE: KY STATE DATA CENTER

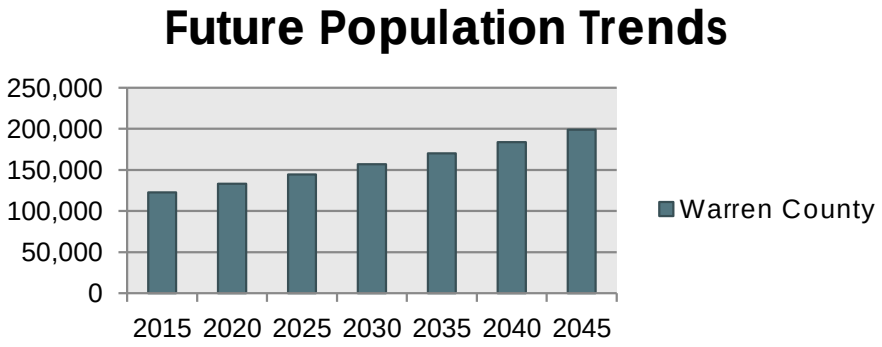


FIGURE 2.3 PROJECTED POPULATION GROWTH, 2015-2045 | SOURCE: KY STATE DATA CENTER

EXHIBIT 2.1-1 | 2045 Metropolitan Transportation Plan

ESTIMATED POPULATION CHANGE, 2018-2045

TRAVEL DEMAND MODEL REGION

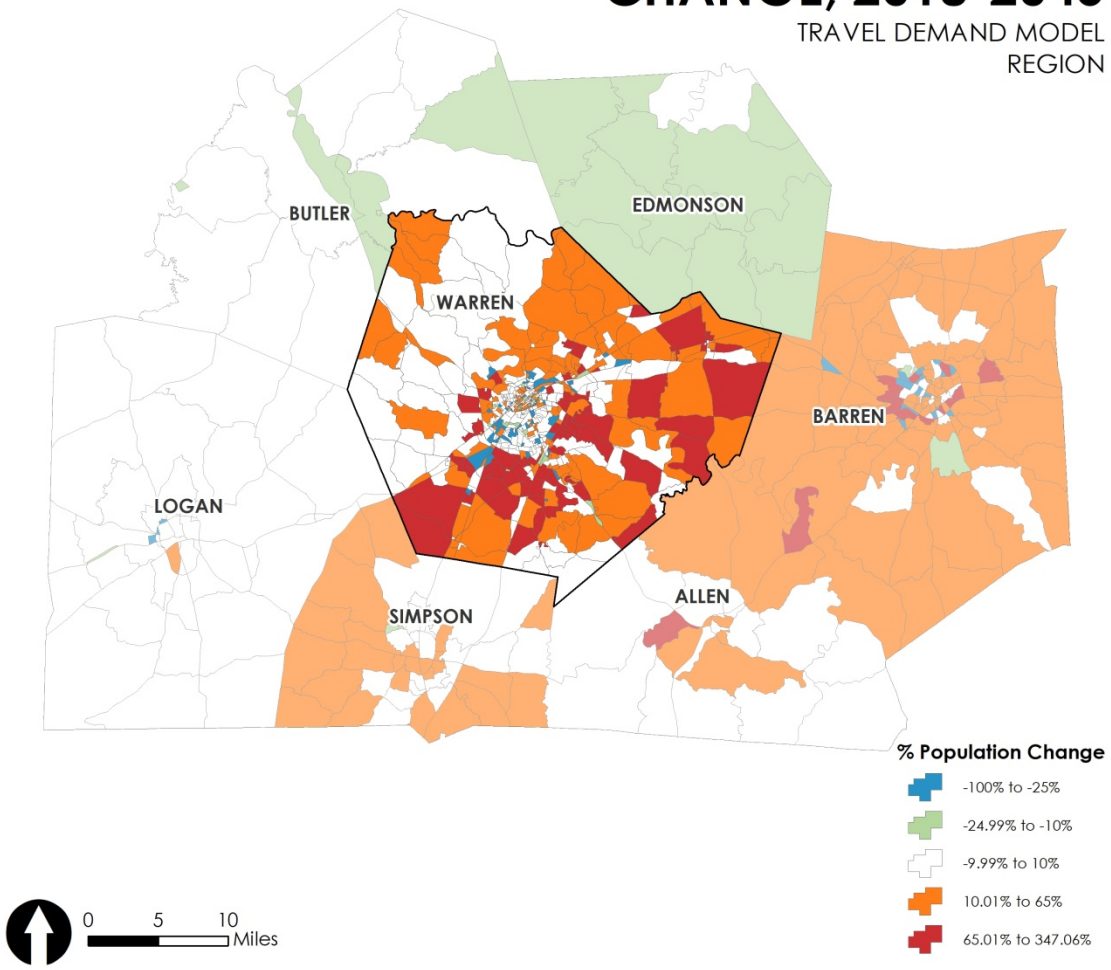
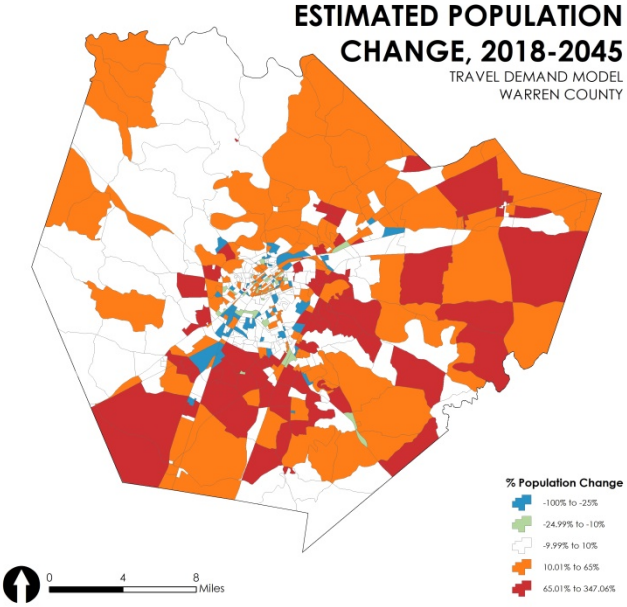


EXHIBIT 2.1-2 | 2045 Metropolitan Transportation Plan

ESTIMATED POPULATION CHANGE, 2018-2045

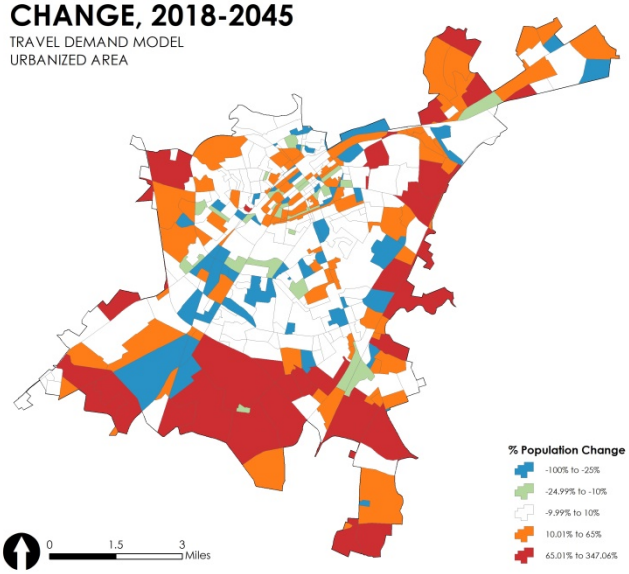
TRAVEL DEMAND MODEL WARREN COUNTY



2045 Metropolitan Transportation Plan | EXHIBIT 2.1-3

ESTIMATED POPULATION CHANGE, 2018-2045

TRAVEL DEMAND MODEL URBANIZED AREA



Households

The number of households and average number of people living within a household also contributes to an area's travel demand. Higher numbers of households and larger household sizes increase trips, thus influencing the travel demand. The table below explores household trends over nearly fifty years. Since 1970, the number of households in Warren County has grown 225%; however, the number of persons per household has declined. Today, the average household size for Warren County is 2.53 – that's a 36% decrease from 1970. The household growth trends continue into the future as Warren County's number of households is projected to grow by 72-percent in the next 25 years, as identified in the graph below.

TABLE 2.1 | Household Trends, 1970-2018*

	1970	1980	1990	2000	2010	2018	Percent Change
Warren County							
Number of Households	14,527	24,833	28,819	35,365	43,674	47,142	225%
Household Size	3.95	2.8	2.5	2.5	2.5	2.53	-36%
Bowling Green							
Number of Households	10,988	14,313	15,973	19,277	22,735	24,176	120%
Household Size	3.3	2.8	2.3	2.3	2.3	2.42	-27%

Source: U.S. Census Bureau, Census of Population and Housing ; U.S. Census Bureau, American Community Survey (ACS) 2018 Five-Year Estimates

**Household numbers do not include group quarters (Institutional, such as correctional facilities, nursing homes or mental hospitals; Non-Institutional, such as college dormitories, military barracks, group homes, missions, or shelters)*

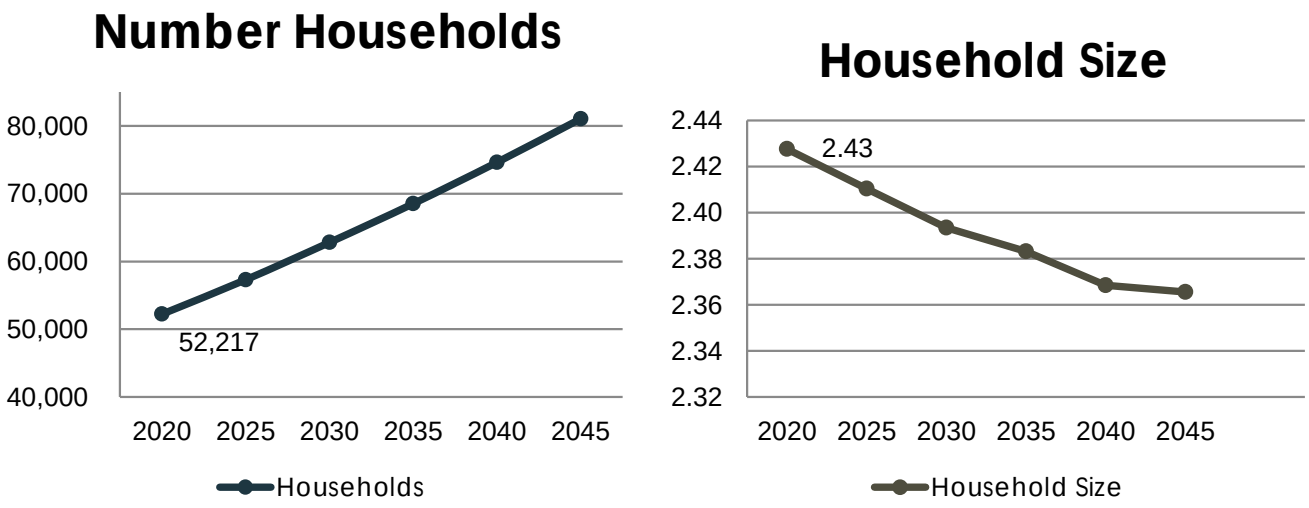


FIGURE 2.4 2020-2045 HOUSEHOLD PROJECTIONS | SOURCE: KY STATE DATA CENTER

ECONOMY

As identified throughout this section, infrastructure demands are largely driven by socioeconomic factors. A healthy economy cannot survive without efficient, reliable, and accessible infrastructure. Both economic and social benefits and opportunities are the result of a reliable and efficient transportation system. Better access is provided to businesses, employment, education, and other destinations, thus improving the local economy. On the reverse, if the transportation system is deficient in capacity or reliability, the economy will suffer from missed development opportunities, growth, and lower quality of life. The median household income for Warren County was reported as the highest in the 10-county Barren River region at $52,000. This is slightly higher than Kentucky's median household income at $48,392. The table below depicts the growth of median household income over the past thirty years.

TABLE 2.2 | Median Household Income Trends

1990	2000	2010	2018
$ 20,428	$ 29,162	$ 43,954	$ 52,007

Source: U.S. Census Bureau; U.S. Census Bureau, American Community Survey

Employment

Employment has a major effect on transportation systems. The more employment that is present within the area, the more trips an area will generate during peak hour travel. The ACS 2018 five-year estimates reported that 65% of Warren County's population was employed. Warren County's working labor force represents the diversity of the community, with the foreign born population contributing to the growth and stability of the economy. The Bowling Green Area Chamber of Commerce reported that Warren County is home to 26 international companies, representing 11 different countries. Warren County's two largest employers are Western Kentucky University and Med Center Health. Additionally, Warren County has two major industrial parks, employing over 6,000 people between the two.

Using the MPO's Regional Travel Demand Model, ***Table 2.3*** on the following page, shows the estimated change in the amount of employment for non-retail (low trip rate jobs per employee, such as manufacturing, industrial, mining, etc.), service (medium trip rate jobs, such as attorney services, public services, universities, etc.), and retail (high trip rate jobs, such as restaurants, service stations, banks, etc.) between 2018 and 2045. Employment for all sectors is expected to continue to grow between 2018 and 2045. Over this twenty-seven year period, total employment is expected to increase by 40,508 workers, or 74%.

TABLE 2.3 | Warren County Employment Changes, 2018-2045							
Total Employment		Non-Retail		Retail		Service	
2018	2045	2018	2045	2018	2045	2018	2045
54,688	95,196	12,503	19,380	32,094	58,946	19,503	34,478
Percent Change		Percent Change		Percent Change		Percent Change	
74%		55%		84%		77%	

Source: KYTC, Bowling Green-Warren County 2045 Travel Demand Model

EXHIBIT 2.2-1 | 2045 Metropolitan Transportation Plan

ESTIMATED EMPLOYMENT CHANGE, 2018-2045

TRAVEL DEMAND MODEL REGION

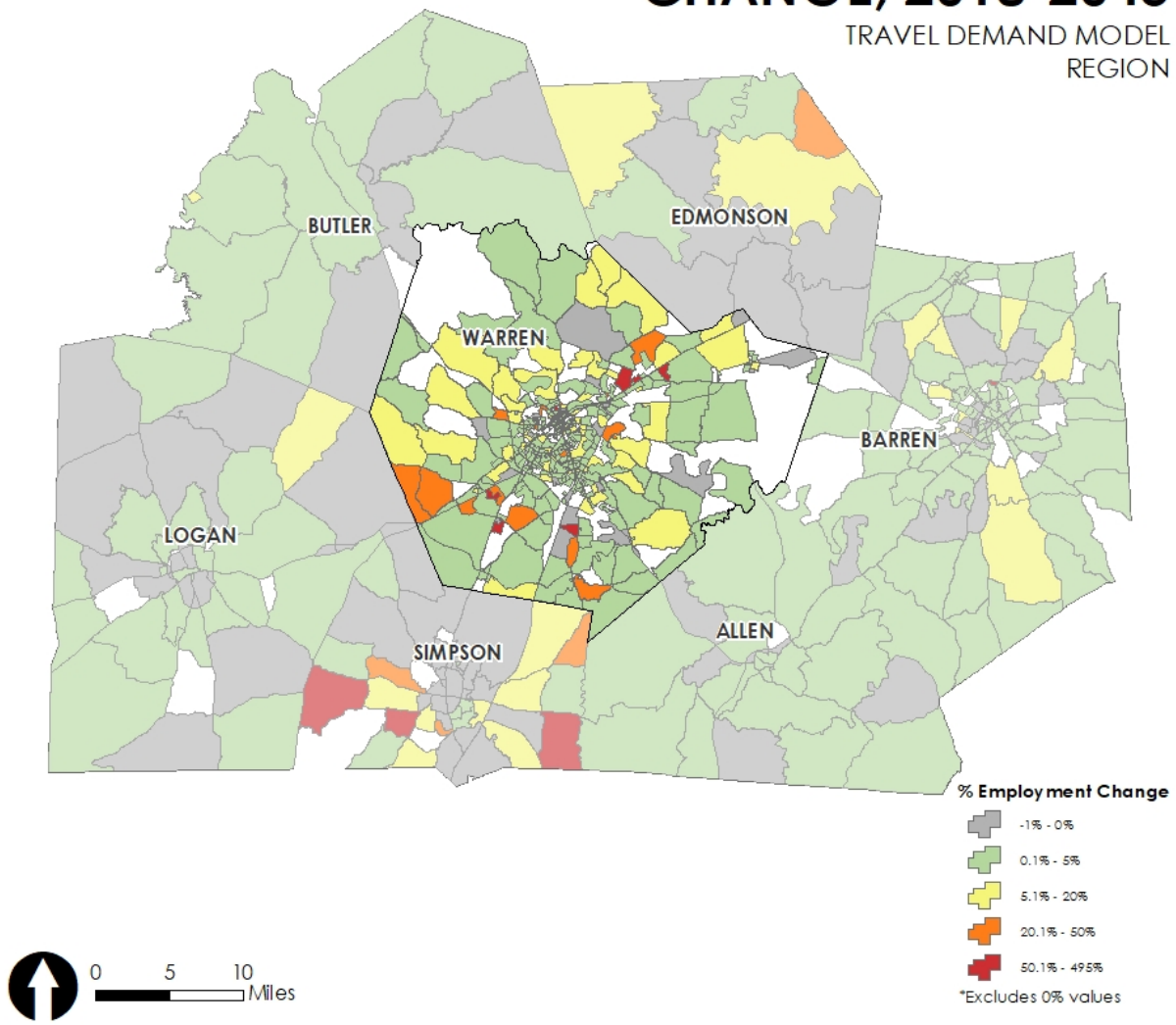


EXHIBIT 2.2-2 | 2045 Metropolitan Transportation Plan

ESTIMATED EMPLOYMENT CHANGE, 2018-2045

TRAVEL DEMAND MODEL
WARREN COUNTY

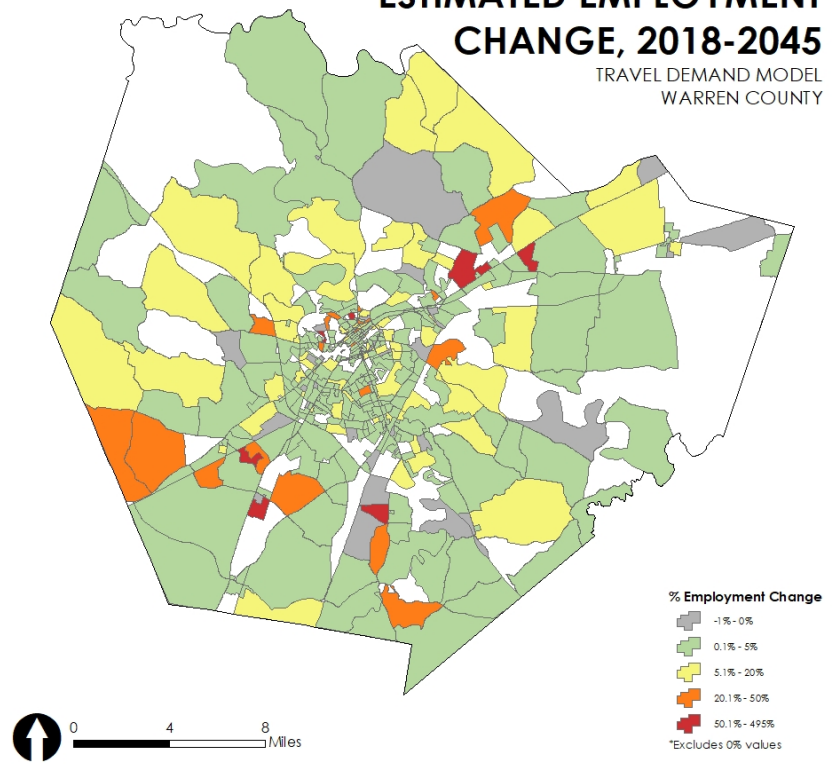
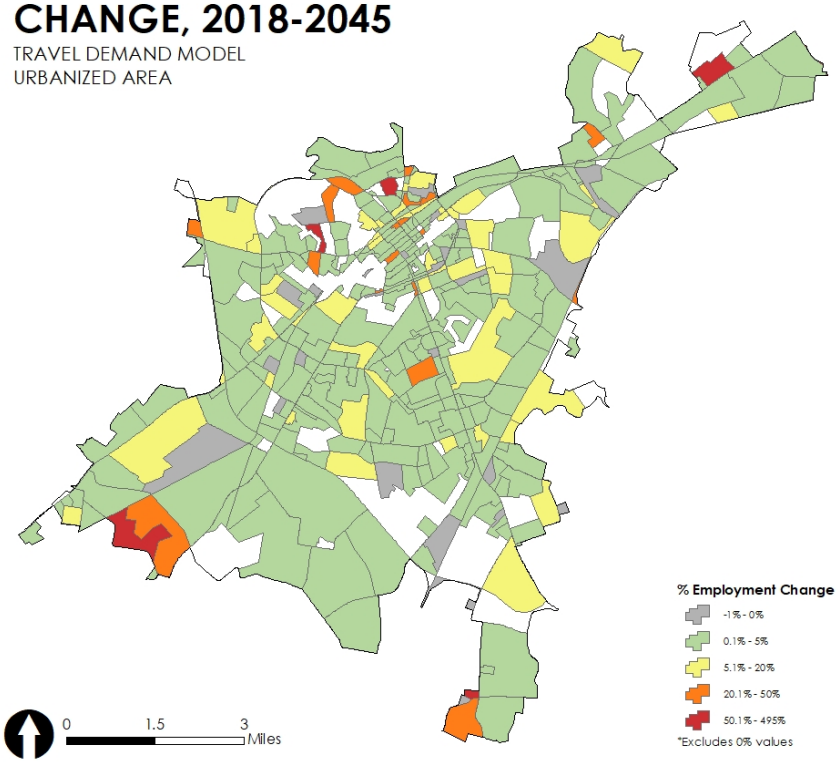


EXHIBIT 2.2-3 | 2045 Metropolitan Transportation Plan

ESTIMATED EMPLOYMENT CHANGE, 2018-2045

TRAVEL DEMAND MODEL
URBANIZED AREA



3. Existing Transportation

In order to accurately reflect the transportation needs of the Bowling Green-Warren County MPO area, an assessment of what currently exists must be compiled. The following information is a summary of the existing transportation services within the Bowling Green-Warren County MPO. This description of the existing transportation system is intended to serve as a reference or baseline for policy and decision makers.

COMMUTING TRENDS

Bowling Green is the economic hub of the region, with both population and employment opportunities steadily rising. Commuting to work or school makes up much of Warren County's daily traffic, particularly with morning and afternoon peak travel. This section will explore the travel patterns of Warren County.

Commuting Patterns

As stated in the previous chapter, Warren County is the regional hub for economic, employment, education and entertainment activities. Of the total working population (age 16 and over), 65% are in the labor force. The Kentucky Commuting Patterns Report, generated by the Kentucky Center for Statistics, used 2015 census tract data to populate commuting patterns for communities across the Commonwealth. The visual below provides an overview of commuting patterns within a 100-mile radius of Warren County. Additional data can be viewed on their website at: HTTPS://KYSTATS.KY.GOV/REPORTS/TABLEAU/KCPR.

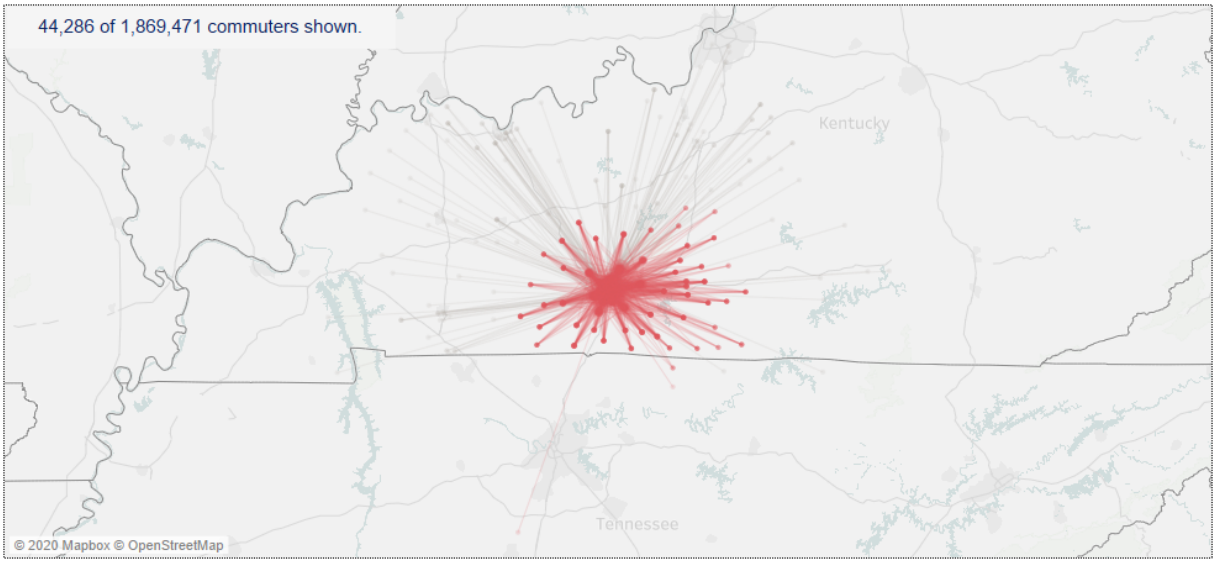


EXHIBIT 3.1 CENSUS TRACT COMMUTING MAP

Commuting Modes & Travel Times

According to the ACS 2018 five-year estimates, 81.5% of Warren County residents reported driving alone as their primary means of commuting to work. The table below depicts the modes of transportation used by Warren County workers for their commute. The average travel time to work for Warren County commuters was 20.2 minutes. It should be noted, of the 47,142 occupied housing units in Warren County, 2,821, or 6.0%, did not have access to a vehicle. Statewide, approximately 7.4% of households do not have access to a vehicle.

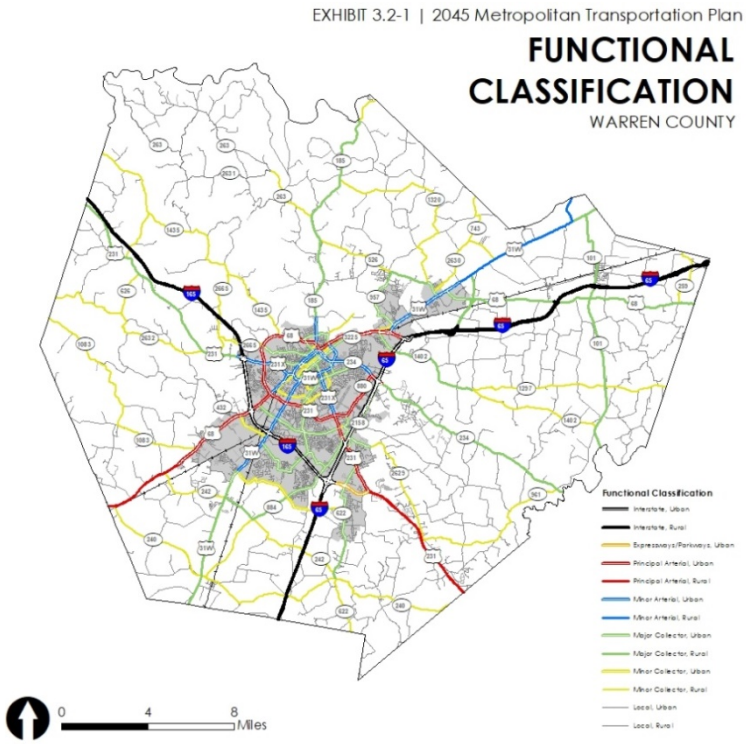
TABLE 3.1 | Warren County Workers Commuting Patterns

Commute Mode	Total	Percent
Drive Alone	48,318	81.5%
Carpooled	6,574	11.1%
Walked	1,796	3.0%
Public Transit	149	0.3%
Worked at Home	1,682	2.8%
Other	761	1.3%
Total Workers 16 and Older	**59,280**	**100.0%**

Source: U.S. Census Bureau American Community Survey, 2018 Five-Year Estimates

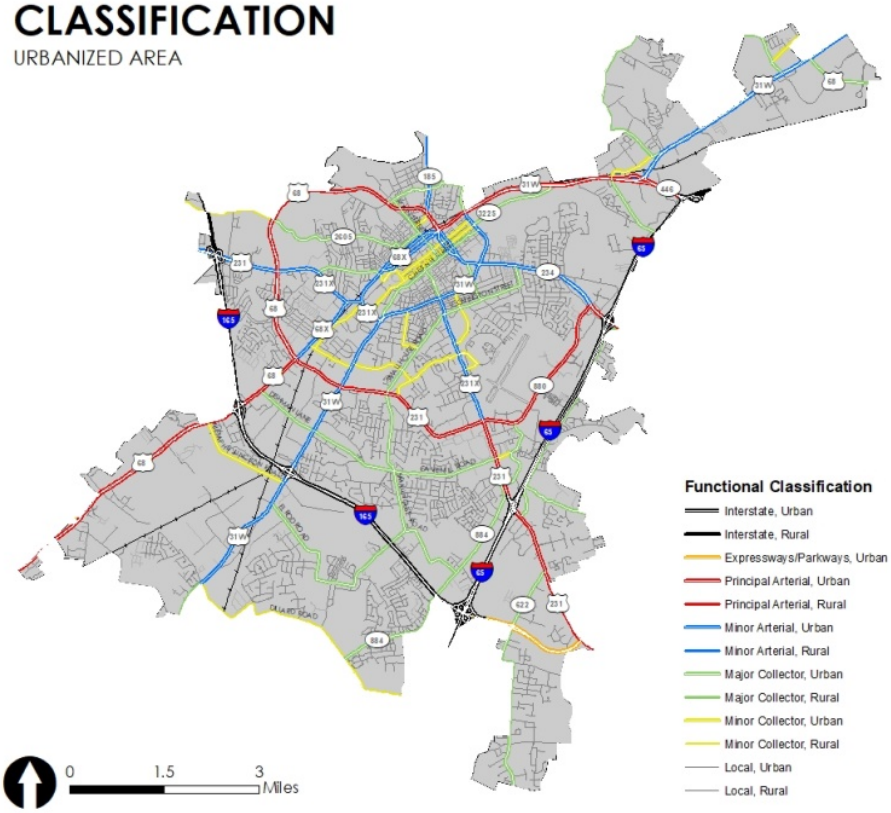
ROADWAY NETWORK

There are over 1,400 miles of public roadways in the MPO area. The road network consists of an array of roadway classifications, from interstate highways to rural local roads. Of these roadway miles, 49.425 miles are interstate and parkway miles consisting of I-65, I-165, and the Natcher Parkway (WN-9007). Not all roadways perform the same function, nor are they funded from a single source of revenues. Thus, all roadways are further defined by their functional classification, as defined by the Federal Highway Administration (FHWA) and described below. Functional



classifications are classified as either urban or rural, contingent upon its location within a FHWA-designated urban area. Roadways are classified as one of the following:

2045 Metropolitan Transportation Plan | EXHIBIT 3.2-2



- **Interstates |** Roadways that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways and other Interstates as designated by the Secretary of Transportation
- **Other Freeways & Expressways |** Non-Interstate roadways with access points limited to on-ramp and off-ramp locations and directional travel lanes usually separated by a physical barrier
- **Other Principal Arterials |** Roadways that provide a high level of traffic mobility for substantial statewide travel and/or serve major activity centers and the longest trip demands within urban areas
- **Minor Arterials** | Roadways that serve trips of moderate length to smaller geographic areas and at a slightly lower level of traffic mobility than Principal Arterials
- **Major Collectors |** Roadways that distribute and channel trips between the lower classifications and the arterial systems
- **Minor Collectors |** Roadways that distribute and channel trips between Local Roads and the higher classifications at a lower level of traffic mobility than Major Collectors
- **Local Roads |** Roadways that primarily provide direct access to adjacent land and are not intended for use in long distance travel

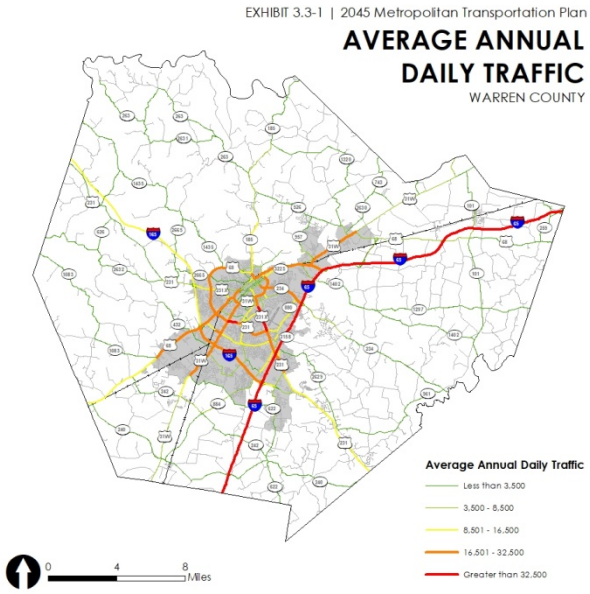
TABLE 3.2 | Warren County Roadway Mileage by Functional Classification	
Functional Classification	**Total Centerline Mileage**
Interstate	47.346
Freeway/Expressway	2.079
Principal Arterial	36.221
Minor Arterial	33.636
Major Collector	122.416
Minor Collector	158.049
Local	1,081.538
Total	**1,481.285**

Maintenance of Transportation Network

Keeping the transportation network in working order is of utmost importance to the public and a primary goal of transportation agencies. In particular, poor roadway and bridge condition can degrade user experience and pose numerous safety and efficiency concerns. As stated above, there are over 1,400 miles of public roadways serving Warren County. The Kentucky Transportation Cabinet maintains the federal and state highways, the Bowling Green Public Works Department maintains city streets, and the Warren County Public Works Department maintains county roads. Maintenance responsibilities include, but are not limited to: street/sidewalk maintenance and repair, ice and snow removal, traffic control, greenways, and rights-of-way vegetation control. The cities of Plum Springs, Oakland, Smiths Grove, and Woodburn have informal agreements concerning the maintenance of streets with Warren County. These agreements cover limited ice and snow removal, minor street maintenance, open ditch maintenance and rights-of-way vegetation control. Street overlay and pavement work in all four cities is contracted with private contractors. ***Table 3.3*** below delineates the roadway lane mileage maintained by each respective jurisdiction.

TABLE 3.3 | Roadway Maintenance Mileage	
Jurisdiction	**Centerline Miles**
Kentucky Transportation Cabinet	381.236
City of Bowling Green	314.761
Warren County	710.741

Vehicle Miles of Travel / Average Daily Traffic



Vehicle miles of travel (VMT) represents not just personal travel, but also travel associated with the movement of goods and services. Thus, VMT is largely influenced by economic trends. Spikes and/or dips in a region's VMT can often be traced to economic fluctuations, consumer trends, and ultimately how a region's goods and services are being delivered. Warren County's VMT over the first part of the past decade held steady; however, in the last five years, daily VMT in Warren County has been on the rise, with the biggest jumps in 2015 and 2017. This may be attributed to the growth of e-commerce and the frequency of consumer purchasing habits, coupled with decreasing gas prices. The graphs below depict daily VMT trends over the past ten (10) years for Warren County and percent changes in daily VMT for Warren County and Kentucky. Additionally, travel usage on roadway segments can be evaluated by average annual daily traffic (AADT). AADT for state-maintained roadways across Warren County is depicted in ***Exhibit 3.3-1*** and ***3.3-2.***

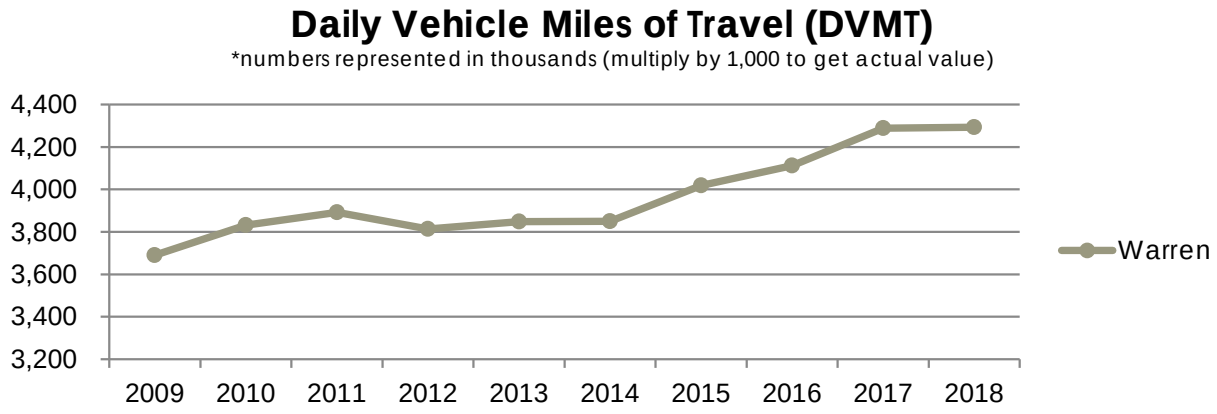
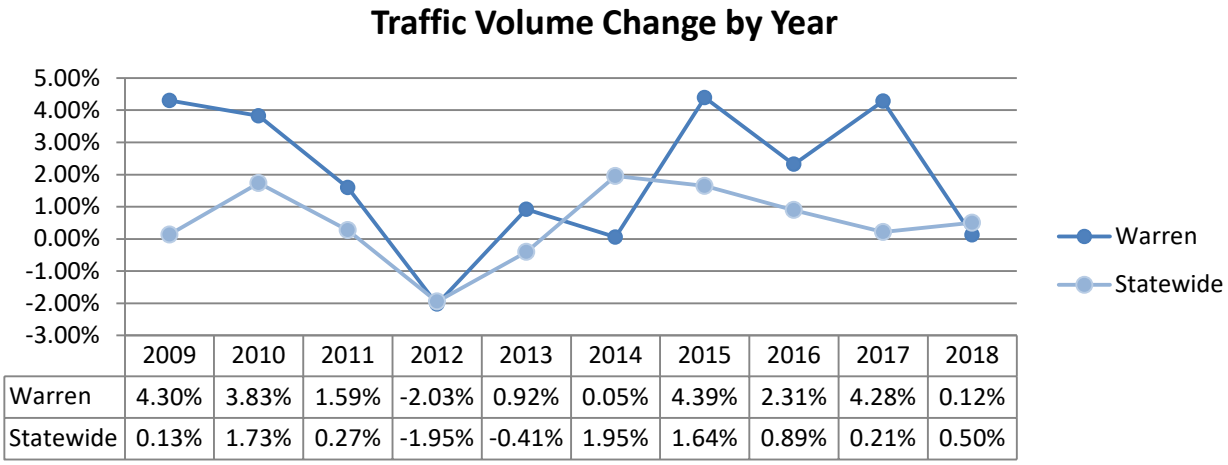
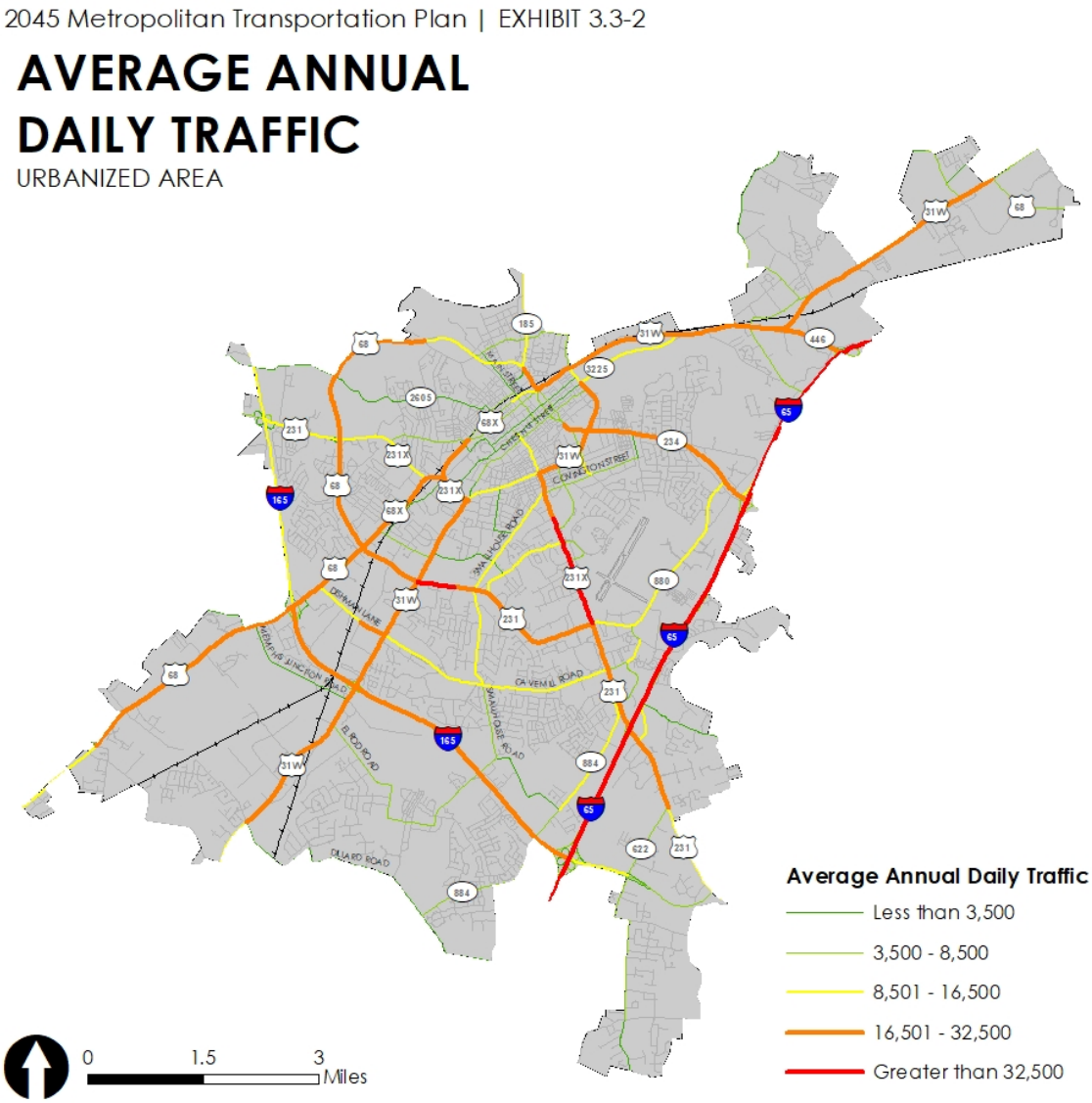


FIGURE 3.1 DAILY VEHICLE MILES OF TRAVEL



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Warren	4.30%	3.83%	1.59%	-2.03%	0.92%	0.05%	4.39%	2.31%	4.28%	0.12%
Statewide	0.13%	1.73%	0.27%	-1.95%	-0.41%	1.95%	1.64%	0.89%	0.21%	0.50%

FIGURE 3.2 TRAFFIC VOLUME CHANGE



BICYCLE & PEDESTRIAN NETWORK

Numerous agencies, including the Chamber of Commerce, the City-County Planning Commission of Warren County, and City and County School Systems, as well as other public and private entities, such as the Bowling Green Area Convention and Visitors Bureau and the Downtown Redevelopment Authority, all have a common vision for a walkable and bike-friendly community, for diverse reasons. Having a well-connected network of sidewalks, greenways, bikeways, park trails, and foot paths allows for healthy living and recreational opportunities for both residents and visitors, while also providing safe, direct connections to destinations or transit stops for those that rely upon walking, biking, or transit for mobility. Beyond the inner core, Bowling Green has grown, and continues to grow in a suburban-style development pattern which poses as a challenge to non-motorized connectivity. Overall, walkability is highest in and around downtown Bowling Green.

In 2017, the MPO worked with Nashville-based consulting firm, RPM, to develop the Multimodal Implementation Plan. In this endeavor, RPM developed a latent demand trip model using parcel-level population, employment, land use, and proximity data. The model shows levels of concentrations for expected non-motorized transportation users based on the data. Exhibits that represent the higher concentrations of walkers, bicyclists, and transit users in the MPO area can be found in the MULTIMODAL IMPLEMENTATION PLAN (pages 19-20). This data has been helpful to the MPO and its planning partners in prioritizing sidewalk, greenway, and bikeway projects as it has allowed staff to see the pockets of the community most dependent on non-motorized transportation modes.

Recent community development trends are prioritizing walkable and bike-friendly development; developments that support alternative modes of transportation and promote a more community-centric atmosphere. With this, mode-sharing services, such as bike-shares and scooter-shares, are becoming ever more popular across the nation (see discussion below). However, many communities are banning scooters and are skeptical of bikes. These mode-sharing services are great in that they provide flexible transportation options at an affordable price, but they also cause many controversies with property owners, public right-of-ways, and overall safety concerns. With the influx of bike-share services in Bowling Green comes the need to prioritize safer streets for all users.

Programs

The MPO has worked to facilitate a comprehensive bicycle and pedestrian program that includes funding for projects, program staffing, a facilities plan, promotion and educational programs and encourages the enforcement of laws and regulations. In early 2018, the formal Greenways Commission was abolished to be restructured as a branch of the MPO. Today, the Bicycle and Pedestrian Advisory Committee (BPAC) oversees the bicycle and pedestrian planning and advisory roles of the MPO. With this,

BikeWalkBG serves as the community component of the MPO's advocacy and education efforts, seeking to encourage biking and walking for all of the Bowling Green community. While dedicated funding does not currently exist for greenway or bikeway projects, the MPO works with local governments to actively pursue grant opportunities as they arise to help fund trail projects. Additionally, the MPO works collaboratively with other local organizations and government departments to pursue safety, educational, and advocacy initiatives.

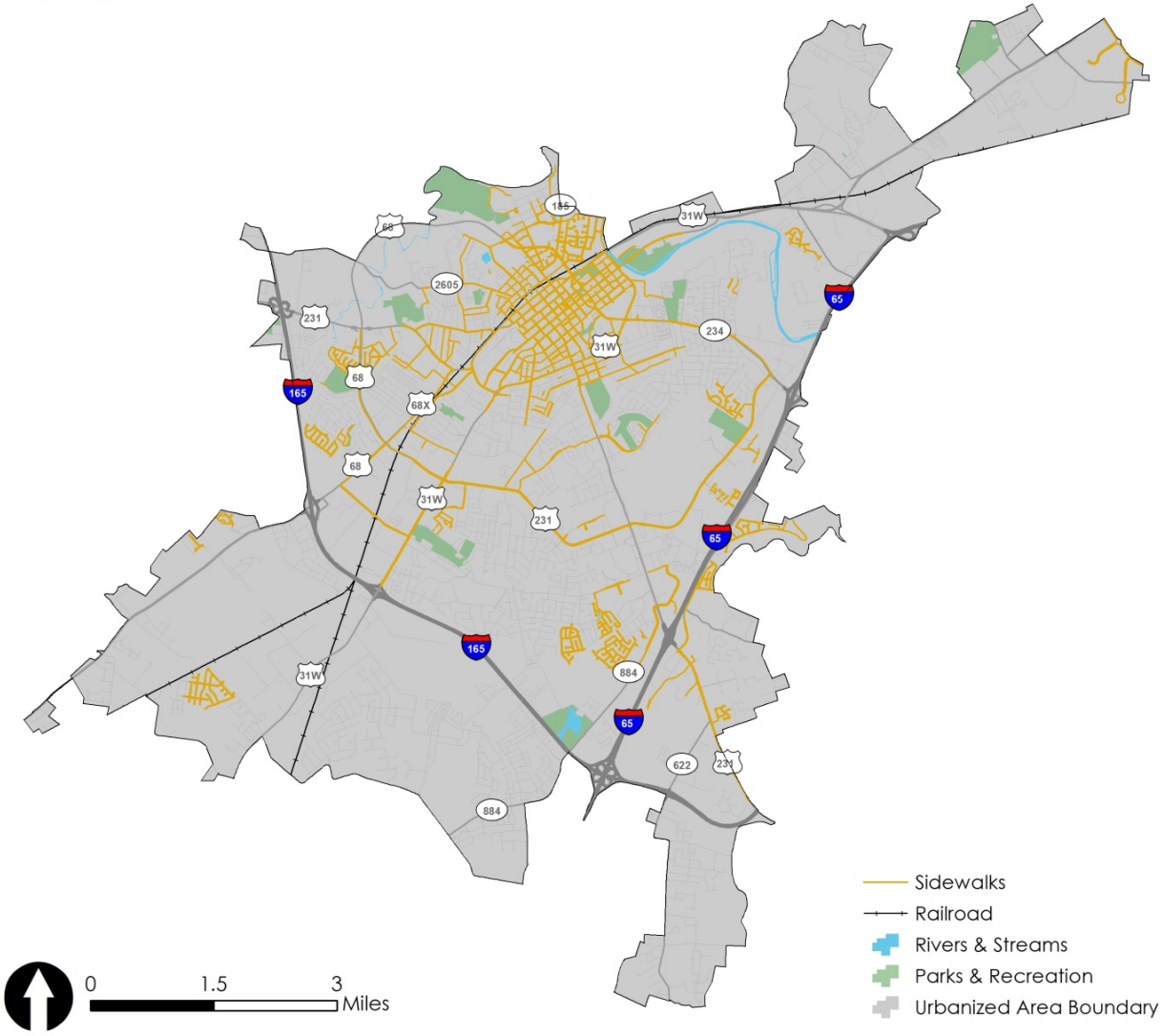
Sidewalk Network

Sidewalks are a key component to Bowling Green's multimodal transportation system. The network provides safe connections between neighborhoods, greenway facilities, schools, parks, downtown, commercial areas, and other important community destinations. The City of Bowling Green has a dedicated budget for the construction and maintenance of sidewalk facilities, with $500,000 allocated to construct new sidewalk connections annually. Overall, the City's Sidewalk Program coordinates the "identification, selection, design, funding sources, and construction management for new sidewalk projects in the City of Bowling Green". Projects are identified through community requests, vetted by a set of qualification requirements, and then prioritized against one another using a scoring methodology. See ***Exhibit 3.4*** for the City's sidewalk network as of 2019.

2045 Metropolitan Transportation Plan | EXHIBIT 3.4

SIDEWALK LOCATIONS

URBANIZED AREA

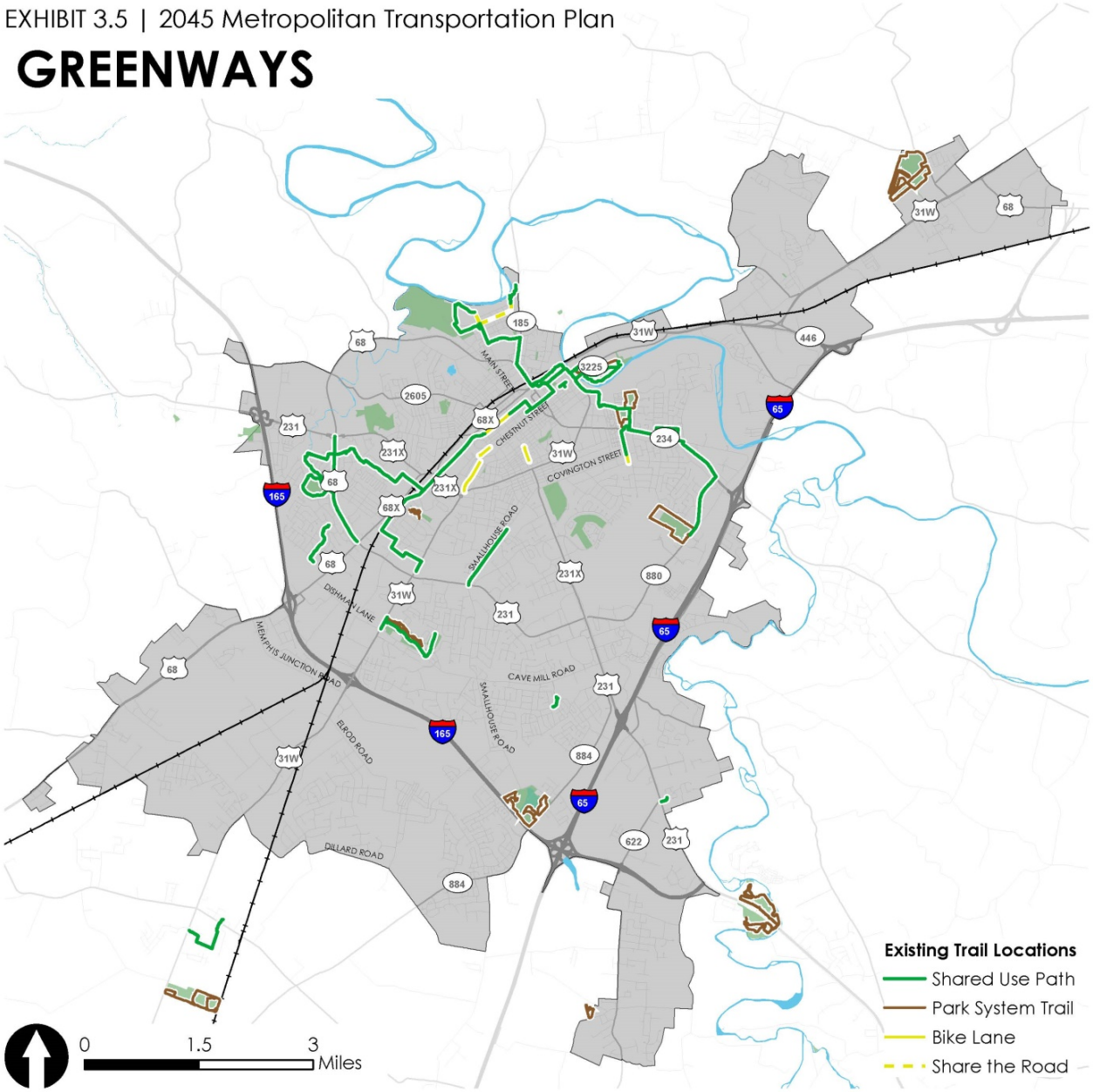


Greenway & Bikeway Network

The existing greenway network is made up of several facility types that provide varying levels of separation from roadway traffic. The spectrum includes traditional shared-use paths, shared-use paths within a roadway's right-of-way (essentially wide sidewalks), and, although less common, neighborhood streets and alleyways only equipped with greenway wayfinding signage. A variety of facility types allows for greater flexibility in the network's ability to serve both recreational and utilitarian non-motorized users. The dedicated bikeway network is in its infancy stages. A few scattered bike lane connections exist in and around downtown along roadways such as Center Street, Nashville Road, State Street, and College Street. Shared roadways also exist in Bowling

Green and are identified by “Share the Road” and/or bicycle warning signage. While not all are signed, common bicycle routes were identified in the 2015 Greenway Master Plan. ***Exhibit 3.5*** shows the existing greenway and bikeway network in Bowling Green.

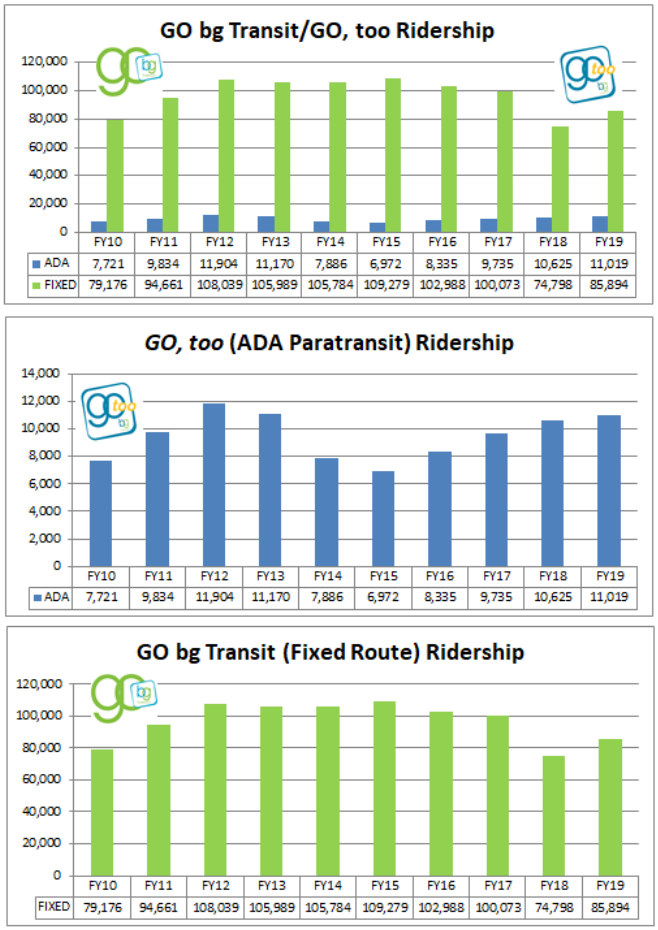
EXHIBIT 3.5 | 2045 Metropolitan Transportation Plan



PUBLIC TRANSIT SERVICES

Presently, there are two fixed-route transit services operating within the Bowling Green-Warren County MPO area, GO bg Transit System and the WKU Transit System, known as Topper Transit.

Fixed route transit service relies upon direct pedestrian connections between bus stops, origins, and destinations. Transit service reacts to the density of development within the city, location of transportation corridors and activity centers, and the design of developments along the corridors and centers it serves. Public transit systems generally include both transit and para-transit components. Para-transit is designed to carry passengers from their origins to specific destinations (often door-to-door) by immediate request or by prior reservation. Some additional special transit services are available in Warren County targeted to specific clients, such as the elderly or disabled residents. GO bg and WKU para-transit service complements fixed-route service by closely matching service areas and operational hours. In conjunction with the fixed-route transit services, private para-transit companies provide door-to-door service throughout the community.



GO bg Transit

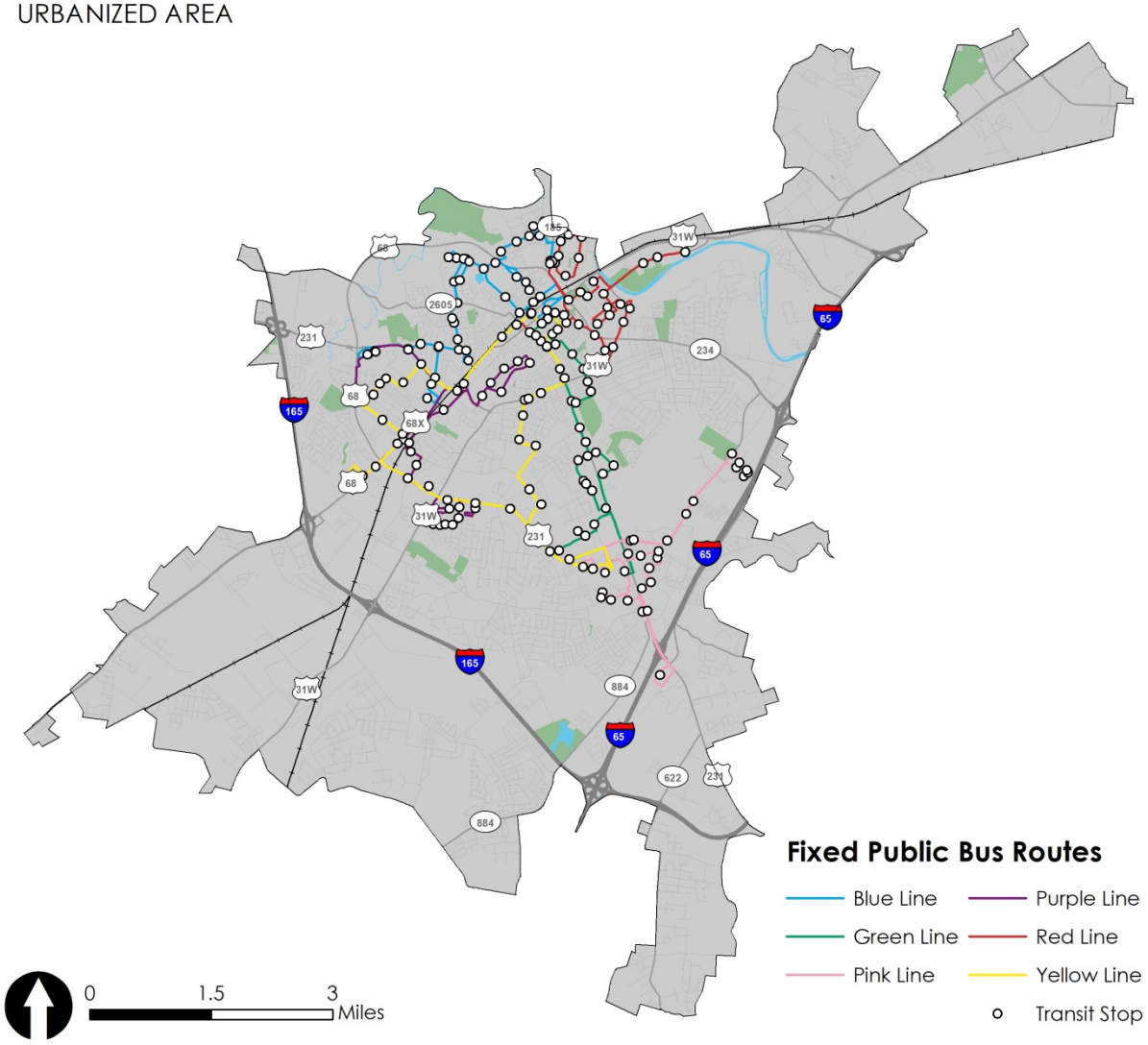
Community Action of Southern Kentucky (CASOKY) operates GO bg Transit, a fixed route transit system, in addition to their para-transit service, GO, too, through a contract with the City of Bowling Green. The GO bg transit system currently operates six fixed-routes and ADA origin to destination service for individuals with disabilities on Monday through Friday, designated holidays, and a shopping shuttle consisting of two routes operating the second Saturday of each month. ***Exhibit 3.6*** shows the location of the fixed GO bg Transit routes. The graphs to the left depict the change in ridership over the past 10 years for GO bg's fixed routes and para-transit services.

FIGURE 3.3 GO BG TRANSIT RIDERSHIP TRENDS

2045 Metropolitan Transportation Plan | EXHIBIT 3.6

GO BG TRANSIT

URBANIZED AREA



Topper Transit

Western Kentucky University (WKU) Topper Transit runs transit service in and around WKU's main and south campuses that is free and open to all students, faculty, staff, and the general public. Ridership for Topper Transit peaked at 809,000 passengers in SFY 16 and is consistently over 700,000 passenger trips annually.

Currently, Topper Transit operates three (3) fixed routes during the spring and fall semesters. On-demand para-transit service is available to disabled customers during the week. Transit service is reduced during intersession periods.

Topper Transit's service area includes the main and south campus of WKU. During evening hours on Wednesday and Saturday, Topper Transit offers fixed route service to popular retail and dining locations on Campbell Lane.

Topper Transit utilizes the latest in transit vehicle tracking technology. The NextBus system uses a geo-positioning system to track the location of each bus on each individual route. Passengers can receive "real-time" updates on the arrival of the next bus at their stop location. The graph and table below show Topper Transit ridership complemented by WKU full-time student enrollment over the last ten years. It should be noted, that amidst a slowly declining WKU student enrollment, Topper Transit peaked in 2011. While ridership has gradually declined in the years since, FY19 reported greater ridership than in 2009, when student enrollment was higher.

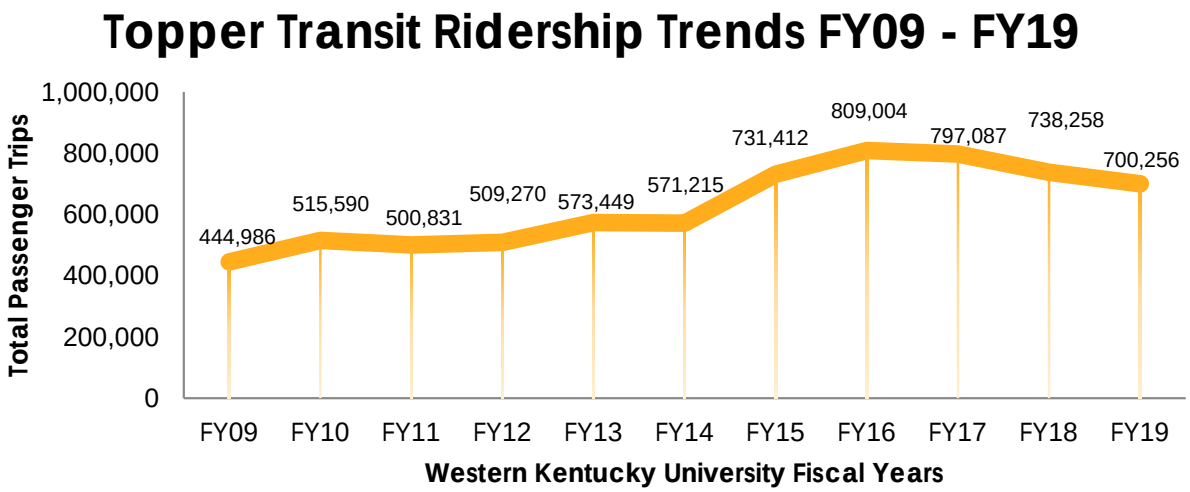


Figure 3.4 Topper Transit Ridership

TABLE 3.4 | WKU Full-Time Student Enrollment

FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
16,140	16,861	17,000	16,943	16,877	16,362	16,211	16,143	16,200	15,954	15,306

Transit Trends

As depicted in the graphs provided above, both transit providers have underwent varying ridership fluctuations. There are many factors that contribute to increased and decreased ridership. Bowling Green-Warren County has a large international population that relies on public transportation, both through GObg Transit and Topper Transit. Over the last several years, there has been a decline in international students at WKU and international populations migrating to Warren County as a whole, thus

influencing the population of transit users. Additionally, with the rise and convenience of shared mobility services, as discussed in the proceeding section, fewer people may use public transportation services. Other factors may contribute to the trends depicted for the MPO area, including, but not limited to: route and stop location changes, user knowledge of the transit systems and changes, student enrollment, international student enrollment, international residents, weather, and other mobility options.

SHARED MOBILITY/ MOBILITY ON-DEMAND

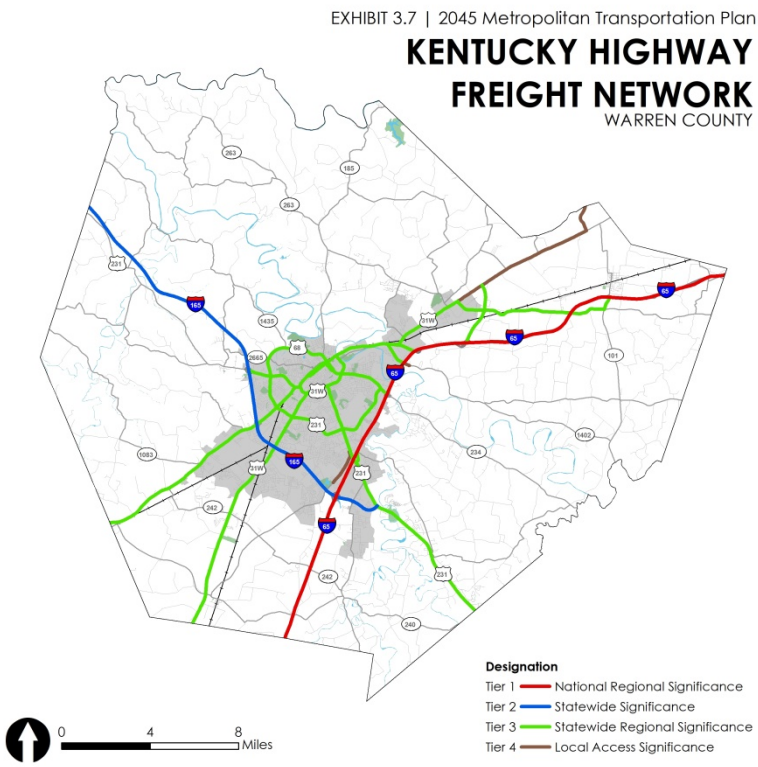
Shared mobility is the umbrella term for the variety of transportation services and resources that are shared among users. The SHARED-USE MOBILITY CENTER (SUMC) identifies the following modes and resources as shared mobility: public transit; taxis and limos; micromobility (bikesharing and scooter sharing); carsharing; ridesharing or ride-hailing; ride-splitting; shuttle services and "microtransit"; private transit services; and more. Several of these services are driven by technology and technology is ever-changing. As technology continues to drive the future of transportation, the SUMC argues that shared mobility and on-demand services offer options and opportunities to:

- Provide more mobility choices
- Offer last mile and first mile solutions
- Reduce traffic congestion
- Mitigate various forms of pollution
- Reduce transportation costs
- Improve efficiency
- Identify choices for those who cannot afford to buy and maintain a vehicle
- Create accessible mobility options for those with limited physical ability

Additionally, the SUMC published a RESEARCH ANALYSIS in 2016 that highlights the value of shared mobility for the growth of public transportation services.

A few of the technology driven shared mobility options exist in Warren County. VeoRide bike share operated bike share (pedal powered bikes and electric-assist bikes) services within a geo-fenced boundary on and around Western Kentucky University's main campus and south campus in the 2019-2020 academic year. Ride-share services, such as Uber and Lyft, also operate in Warren County.

FREIGHT & RAIL NETWORK



The movement of goods is a vital component to the function of local communities, economies, and industries that rely on freight. With Warren County's two major industrial parks, in addition to a number of other industrial sites and companies producing raw materials and goods, our community's varying industries rely on the movement of their goods and materials to, from and through Warren County. The FHWA has identified freight movement as one of the fastest growing and rapidly changing transportation issues. In 2017, the KYTC updated the Kentucky Freight Plan in compliance with the FAST Act to inventory freight use and infrastructure and to provide policy guidance for the operations, maintenance, and long-range planning of the freight network. More information on Kentucky's Freight Plan can be viewed HERE. Additionally, ***Exhibit 3.7*** shows the Kentucky Highway Freight Network and the freight corridors that travel through Warren County. Warren County has a total of 138.4 lane miles on the freight network, classified through the tiers listed below:

- **Tier 1: National Regional Significance |** USDOT designated Primary Freight Network (PFN); AADTT ≥ 7,000 | *Total Miles: 29.2*
- **Tier 2: Statewide Significance |** Remaining segments of interstate or parkway not on the PFN; AADTT of 4,000 to 7,000 | *Total Miles: 20.3*
- **Tier 3: Statewide Regional Significance |** National Highway System Intermodal connectors recognized by/filed with the FHWA; arterials and collectors with AADTT of 500 to 4,000 | *Total Miles: 79.1*
- **Tier 4: Local Access Significance |** Access to major freight generators; local access for freight (first mile, last mile); AADTT under 500 | *Total Miles: 9.8*

The rail transportation system serving the MPO area consists of one major (Class 1) railroad, CSX Transportation, Inc., and one local railroad, R. J. Corman, Memphis line. CSX has connections with the major rail and truck lines in commercial centers around the nation. While intermodal service is becoming increasingly important to many distributors, there is presently no such facility within the area.

SAFETY & SECURITY

Across the nation, the NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION reported 36,560 roadway fatalities in 2018, a 2.4-percent decrease from 2017. Of these fatalities, 10,511 (29 percent) were alcohol-impaired fatalities and 6,283 involved a bicyclist or pedestrian (increased by 3.4 percent). Kentucky reported 724 fatalities throughout 2018, down 8% from 2017. ***Table 3.5*** that follows, represents the fatality changes in Warren County and across Kentucky over the five-year period from 2014 to 2018.

TABLE 3.5 | Roadway Fatalities, 2014-2018

	2014		2015		2016		2017		2018	
Traffic Fatalities	KY	Warren	KY	Warren	KY	Warren	KY	Warren	KY	Warren
Total	**672**	**17**	**761**	**13**	**834**	**23**	**782**	**26**	**724**	**13**
Alcohol-Impaired Driving	171	9	192	2	177	4	179	4	137	1
Speeding Related	125	2	140	0	138	4	138	3	111	0
Motorcyclist	86	2	91	1	111	3	90	1	95	2
Pedestrian	57	1	67	1	81	1	83	3	73	2
Bicyclist	4	0	7	0	9	0	7	0	10	0

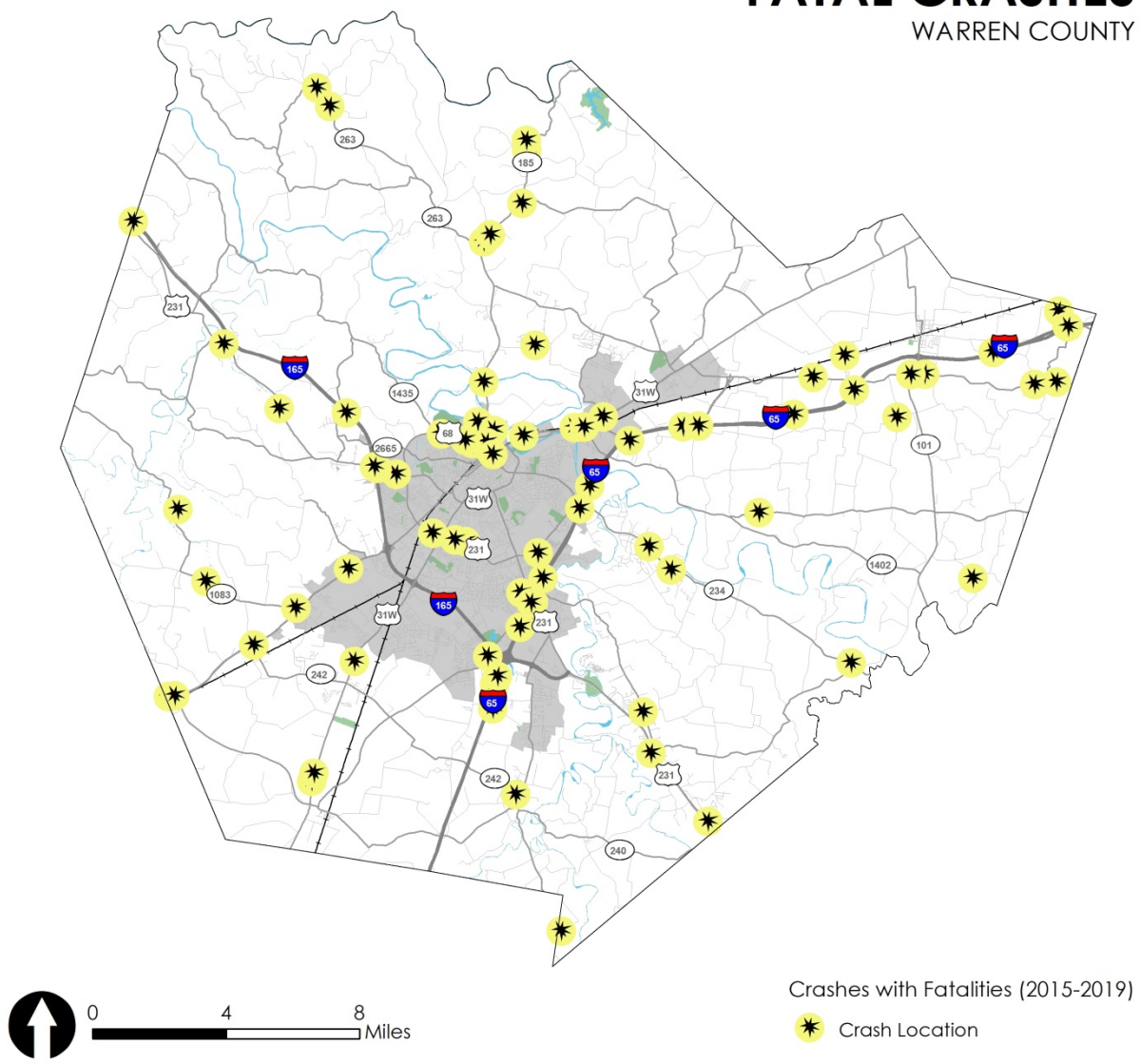
Source: National Highway Traffic Safety Administration

States and local governments across the nation are striving towards zero fatalities with aggressive Vision Zero plans. Some communities are electing to close corridors to vehicles, some are narrowing in to eliminate distracted driving, and others are targeting roadway design and engineering best practices. Additionally, federal performance measure targets are holding states accountable to proactively address safety issues by dedicating funds to safety projects. However, transportation budgets for state and local governments are tight and competitive, and there has yet to be a win-all solution to improving safety and saving lives. Roadway fatalities may be an inevitable component of transportation, but the MPO acknowledges that there are measures to take on the local level to make drivers more aware and create safer streets for all users. The map on the following page displays the location of crashes (2015-2019 KYTC Crash Data) in Warren County resulting in fatalities.

EXHIBIT 3.8 | 2045 Metropolitan Transportation Plan

FATAL CRASHES

WARREN COUNTY



Improving safety and security remains the public's highest concern for the MPO's transportation system. Coordination among all agencies is necessary to address the many factors related to improving safety and security. Some of those factors include: increasing the use of safety equipment, improving driver skills and driver awareness, improving road and pavement conditions, decreasing congestion through innovative traffic control methods, monitoring and addressing roadway conditions during inclement weather, deployment of Intelligent Transportation Systems (ITS) to facilitate traffic flow, and timely communication to the public. Additionally, KENTUCKY'S STRATEGIC HIGHWAY SAFETY PLAN (2020-2024) sets forth a series of initiatives aimed at reducing

crashes. The Strategic Highway Safety Plan provides an outline for improving the safety of Kentucky's roadways by providing an overview of safety data, detailing priority areas, setting goals and performance measures and describing specific programs to help decrease the loss of life and injuries resulting from motor vehicle crashes. The nature of the programs is varied, but they all concentrate on addressing the behavioral issues that lead to crashes and in turn, injuries and fatalities. The SHSP identifies six focused emphasis areas to guide highway safety improvements. These emphasis areas were selected for both the urgency of the problem and the opportunity for improvement.

Collision Data

Collision data was obtained from the KYTC to cover a 5-year range from January 1, 2015 to December 31, 2019 for all of Warren County. The graph below indicates that overall, collision counts for Warren County have gradually declined over the past five years. ***Exhibit 3.9*** on the following page identifies high crash locations through hot spot analysis. Additionally, the chart depicts the most common types of collisions occurring in Warren County.

TABLE 3.6 | Warren County Crashes, 2015-2019

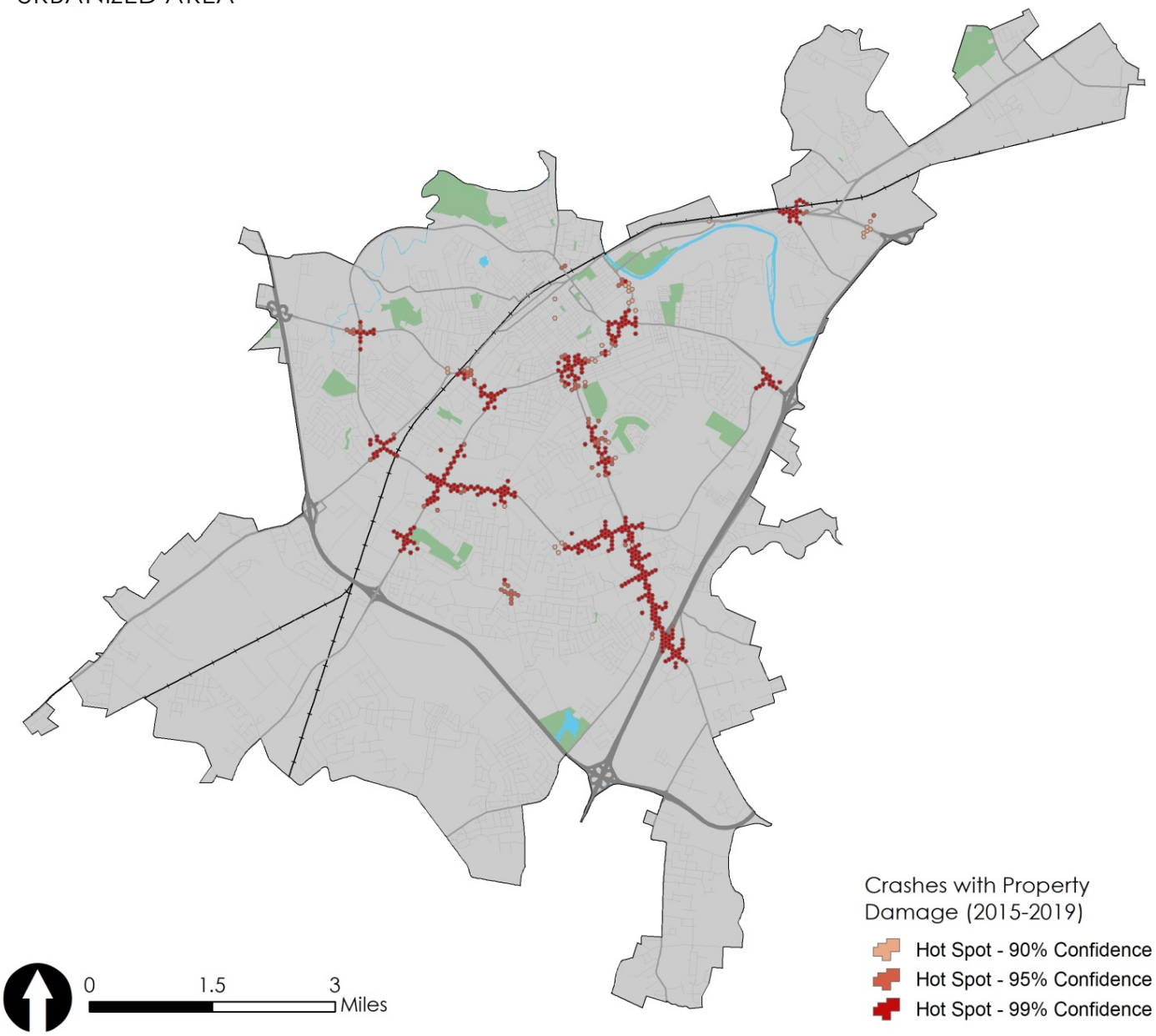
	Total Crashes	Injury Crashes	Fatal Crashes
2019	4,736	1,180	16
2018	4,774	1,085	13
2017	5,049	1,223	26
2016	4,955	1,325	23
2015	4,624	1,167	13

Source: Kentucky Transportation Cabinet/Kentucky State Police

2045 Metropolitan Transportation Plan | EXHIBIT 3.9

CRASH HOT SPOTS

URBANIZED AREA



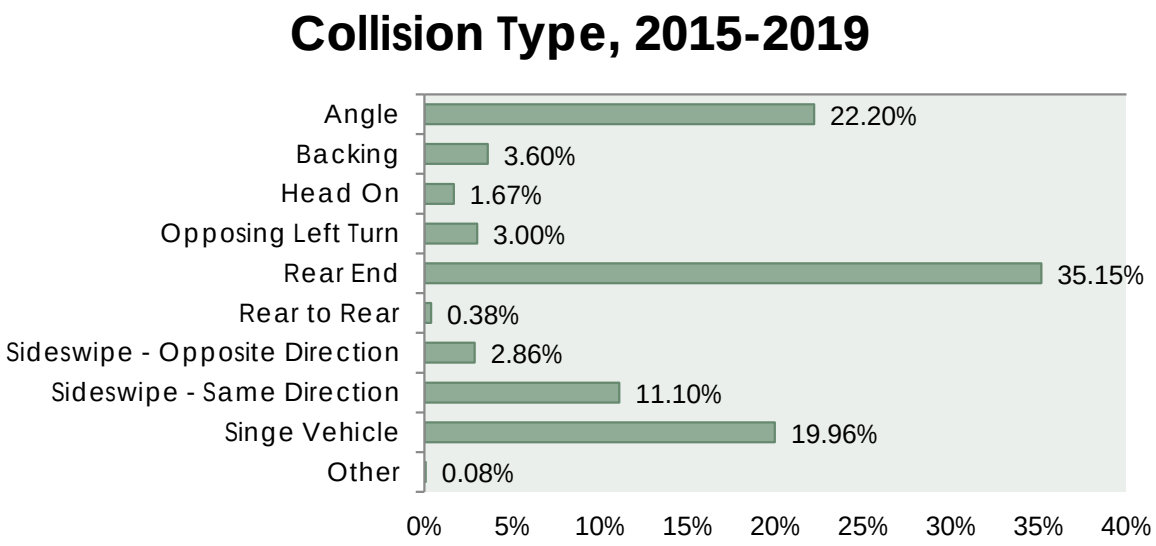


FIGURE 3.5 COLLISION TYPE

Crash Rates

The KYTC is able to determine crash rates, critical crash rates, and critical crash rate factors (CRF) for roadways across the state. The CRF for each roadway segment is based on the expected crash rate of similar facility types across the state. The CRF is one measure of the safety of a road, expressed as a ratio of the crash rate at the location compared to the critical crash rate for similar roadways throughout the state. If the CRF exceeds 1.0, then that highway section has more crashes than is statistically probably based on random occurrence. ***Table 3.7*** shows the percentage of roadway segments with varying CRFs in Warren County; ***Exhibit 3.10*** maps the CRFs occurring within the urbanized area.

TABLE 3.7 | Crash Rate Factors of Warren County Roads - 2019

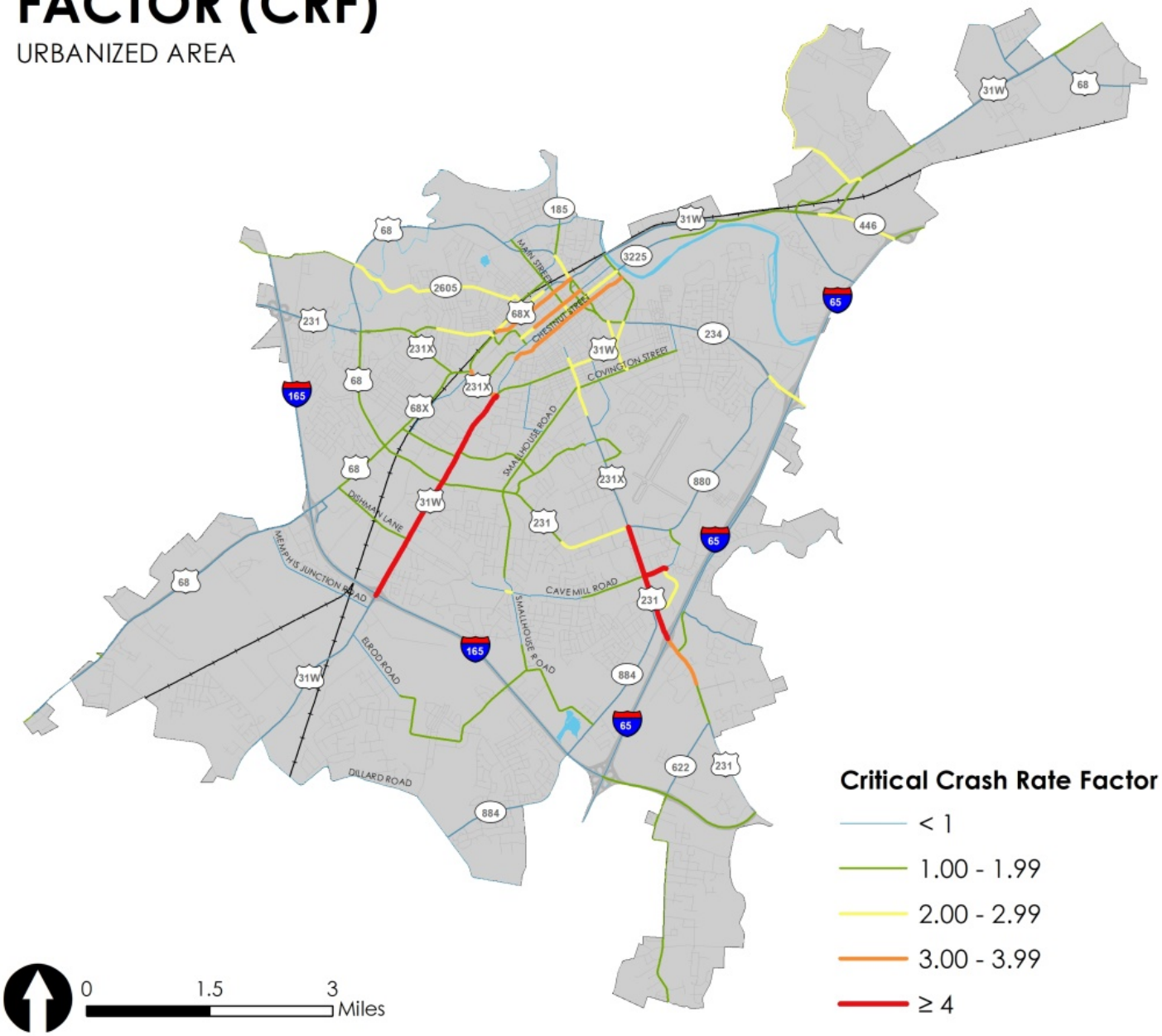
% or Roadways	CRF
59.4%	<1
25.6%	1-2
11.1%	2-3
2.6%	3-4
1.3%	>4

*Total Roadway Mileage Evaluated = 425.5

2045 Metropolitan Transportation Plan | EXHIBIT 3.10

CRITICAL CRASH RATE FACTOR (CRF)

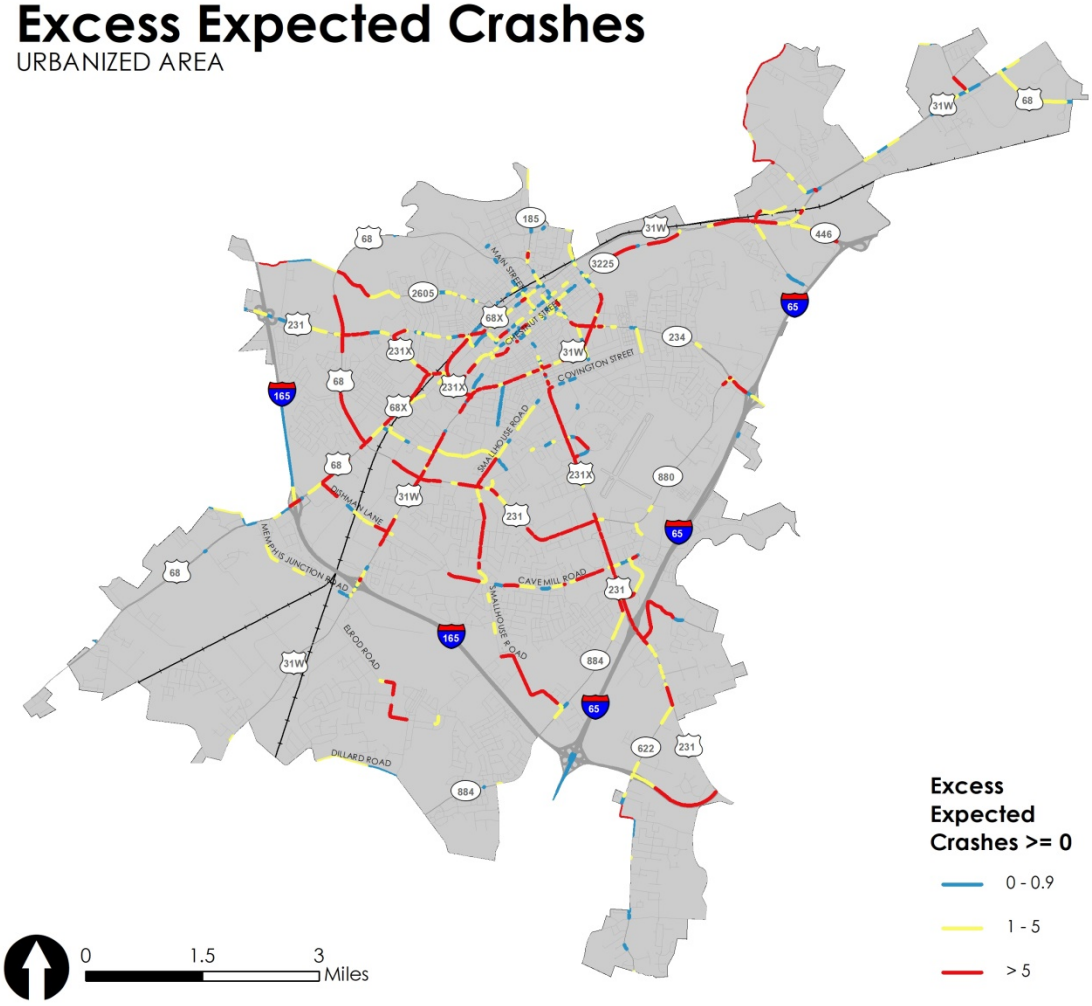
URBANIZED AREA



Excess Expected Crashes

The 2045 MTP update is presenting a new measure to reflect safety performance of roadways within the study area. This measure, referred to as Excess Expected Crashes (EEC), is based on methodology recommended by the AASHTO (American Association of State Highway Transportation Officials) Highway Safety Manual and research conducted by the Kentucky Transportation Cabinet and the Kentucky Transportation Center. EEC is based on crash prediction models (Safety Performance Functions) that estimate the number of crashes that would be expected on a road segment based on traffic volume, length, and roadway characteristics. EEC is a value that represents the difference in a segment's current crashes and the predicted crashes. A negative EEC means the roadway or intersection is experiencing fewer crashes than predicted by the model; a positive value means that more crashes than predicted have occurred, and thus indicates a potential for safety-related concerns. The map below depicts these positive values; the roadway segments that are shown in red, have the highest EEC.

2045 Metropolitan Transportation Plan | Exhibit 3.11



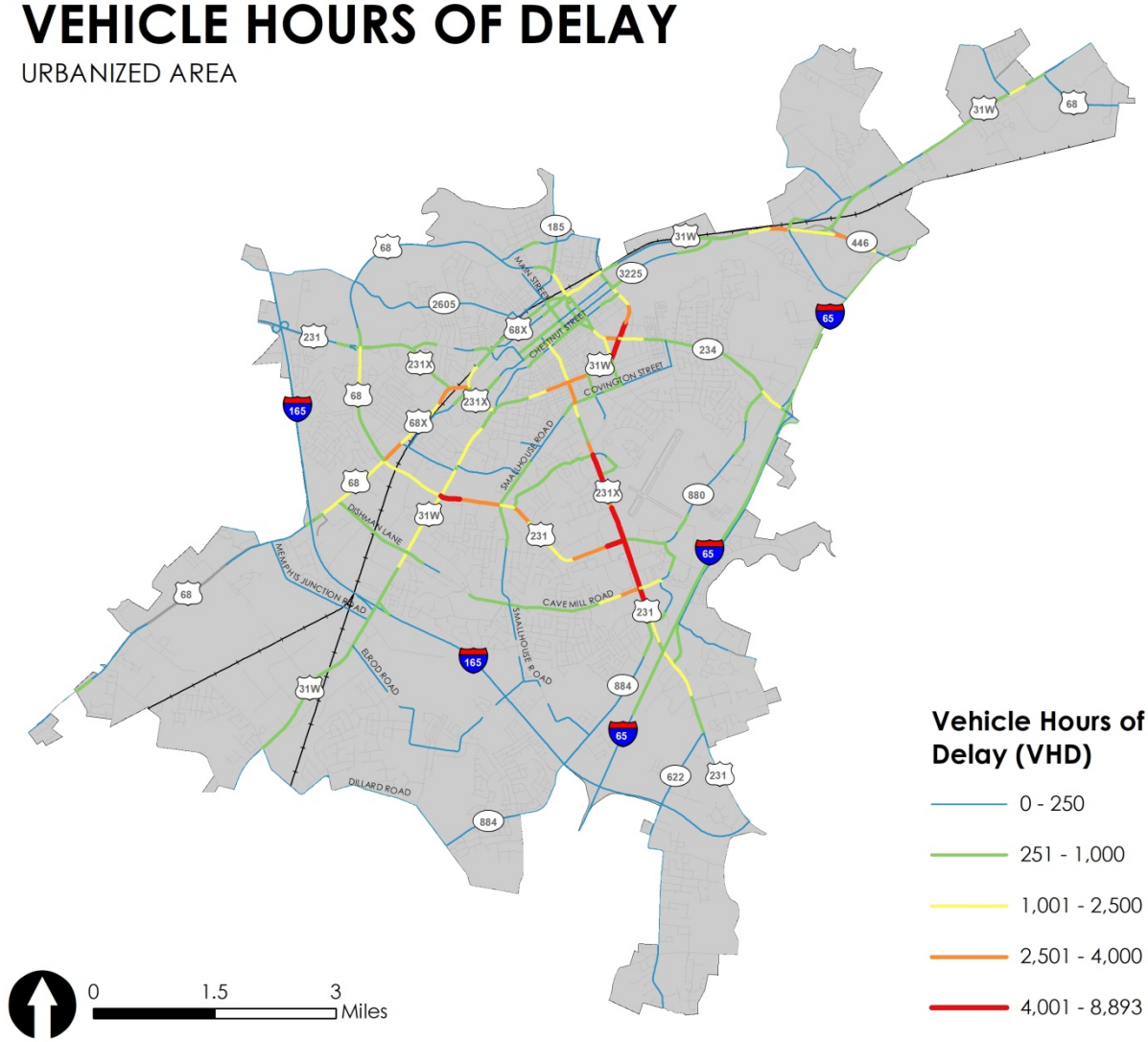
Vehicle Hours of Delay

The measure of roadway congestion utilized for the 2045 MTP update is Vehicle Hours of Delay (VHD). Delay is defined as the excess time a traveler spends on a trip over the time that would be required in uncongested conditions. VHD is the total delay experienced by all vehicles traveling on a section of roadway during a typical day, and it is a measure of the frequency and duration of congestion and the number of vehicles impacted by that congestion. ***Exhibit 3.12*** below shows the locations of lowest to highest delay in the urbanized area.

2045 Metropolitan Transportation Plan | EXHIBIT 3.12

CONGESTION MEASURED BY VEHICLE HOURS OF DELAY

URBANIZED AREA



Air Quality

Air quality conformity must be determined for MPO areas and addressed in the planning documents. Transportation conformity is required by the Clean Air Act Section 176(c) that establishes the framework for improving air quality to protect public health and the environment. The planning area for the Bowling Green-Warren County MPO is in attainment with all federal air quality regulations. An attainment area is considered to have air quality that meets or exceeds the U.S. Environmental Protection Agency (EPA) health standards set forth in the Clean Air Act. The U.S. EPA maintains an interactive air quality map that can be viewed HERE. The following criteria are monitored to maintain air quality conformity: Ozone, Particulate Matter (PM 2.5 and PM 10), and Greenhouse Gas Emissions.

4. Plan Development

When developing the transportation plan for the next 25-years, the MPO sought to encompass a variety of existing resources, along with meaningful public input. The MPO recognizes the relationship between land use and transportation – how they affect one another and must be addressed simultaneously. Our transportation system cannot be structured for the good of the community without regard of current land use patterns, existing land use challenges, and future land use trends. Additionally, the needs and desires of the public further shape the direction of land use trends and/or transportation investments. The following text identifies resources used in developing this Plan.

IDENTIFYING NEEDS

The preceding chapters provided an analysis of the existing conditions for the MPO area, from socioeconomic and population trends to the varying modes of the existing transportation system, which together provided an overview of local travel demands. This overview of conditions helps set the framework for planning future projects.

PUBLIC & STAKEHOLDER INPUT

Public participation was a critical component of the development of this Plan. The MPO sought opportunities to engage a diverse population of the community through two public input phases. The first public input phase was early in the development of the Plan. The second public input phase was near the completion of the draft Plan. In addition to the specific public outreach efforts, all MPO meetings are open to the public and allow time for any member of the public to express comments.

Public Input

The MPO worked with local leaders and organizations to distribute a transportation survey that collected responses on how people travel today, how they might want to travel in the future, and offered opportunity for the public to express their transportation barriers and concerns.

The survey was distributed to MPO contacts, major employers in Warren County, City and County employees, the Chamber of Commerce, healthcare facilities, neighborhood groups, international resource centers and groups, among several others. The survey was published on the City-County Planning Commission, BikeWalkBG, and City of Bowling Green Facebook pages. The survey was open from November 12, 2019 through December 30, 2019. A total of 424 people participated in the survey. Though the MPO did not receive as many responses as hoped, many respondents provided meaningful input for establishing future priorities. The chart below identifies the distribution of residency of the reported survey participants.

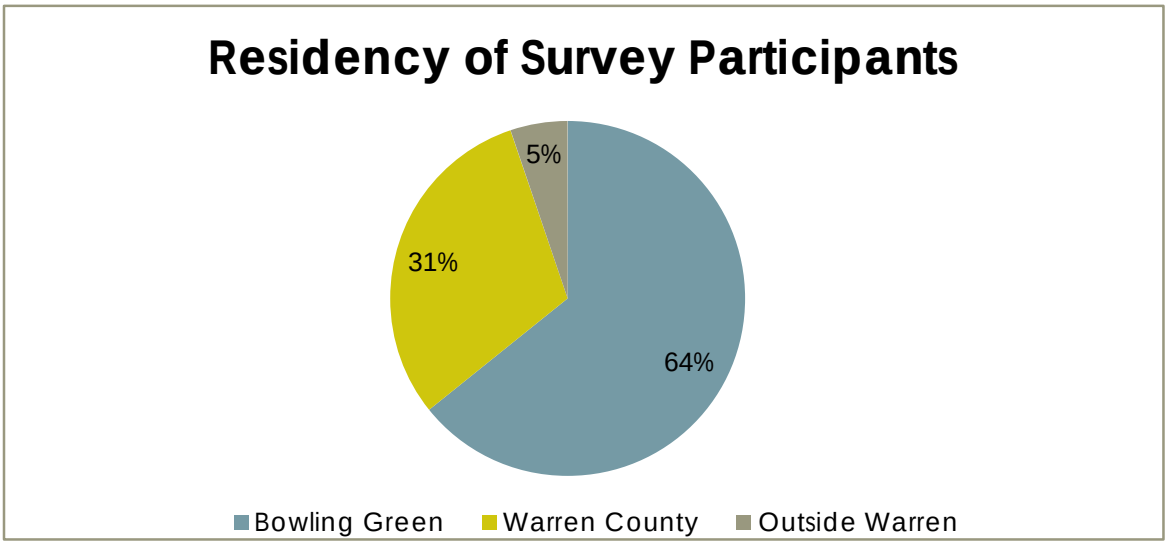


FIGURE 4.1 MTP SURVEY PARTICIPANTS

Most participants reported living and working in Warren County (88.65%) and driving alone for their daily trips (93.82%). Also to note, of the 75% of respondents who provided information regarding race and ethnicity, 15% reported to identify as *not* white/Caucasian. This is valuable to the MPO as Warren County has one of the highest foreign-born populations in the Commonwealth. Cultural differences often present barriers or lack of understanding; engaging with our international populations is of great value to the MPO as we may learn how to best serve the needs of all of our transportation users.

When asked about what transportation modes to be used in the future, most participants reported wanting to use public transportation, followed by biking, and then walking. The chart below displays the distribution of the weighted percent of responses for future transportation modes.

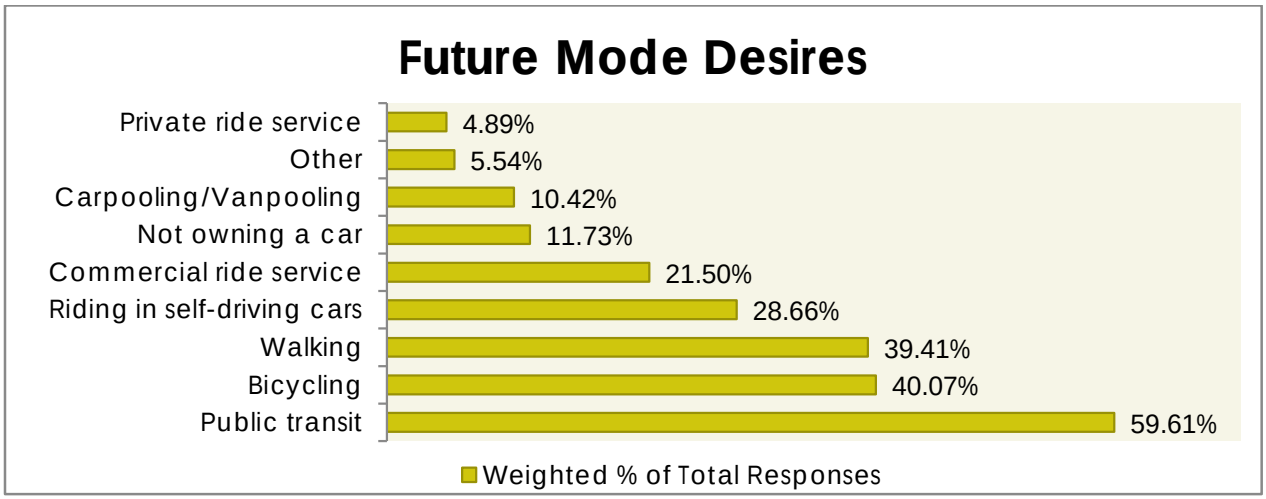


FIGURE 4.2 FUTURE MODE DESIRES BY SURVEY PARTICIPANTS

Many of the responses regarding specific improvements to the transit system, bicycle facilities, and pedestrian facilities were evenly dispersed. While each question had a top contender, the weighted scores between each improvement type were not significant. Despite the lack of overwhelming priorities, the following multimodal improvement options received the highest weighted score for each respective question:

- Expand bus service to other parts of the community
- Construct additional shared-use paths (e.g. Greenways)
- Construct additional sidewalks

Additionally, the survey compiled responses about how respondents envision the future of Bowling Green-Warren County to look, feel, and function over the next twenty-five year period. Participants were asked to select their priority level (I don't care, Not important, Neutral, Important, Very important) of various future options listed in the survey. The following order provides a snapshot of the top priorities:

- Promote economic development
- Encourage walk / bike focus
- Improve the visual appeal of roadways (e.g. beautification)
- Expand areas of new growth
- Encourage urban density
- Support car and ride share services / Park and Ride options
- Support new technologies (e.g. self-driving vehicles)

The survey also allowed participants to submit general comments about the community's transportation system. A total of 149 comments were submitted. In general, many comments were submitted regarding improvements to the multimodal transportation system. Additionally, congestion at peak hours and poor traffic signal timing were top comments regarding roadway concerns. The individual roadway that received the most comments was Scottsville Road. Of the submitted comments, many had similar topics of concerns. The graph on the following page breaks out the most common comment themes that received three or more comments on an individual topic.

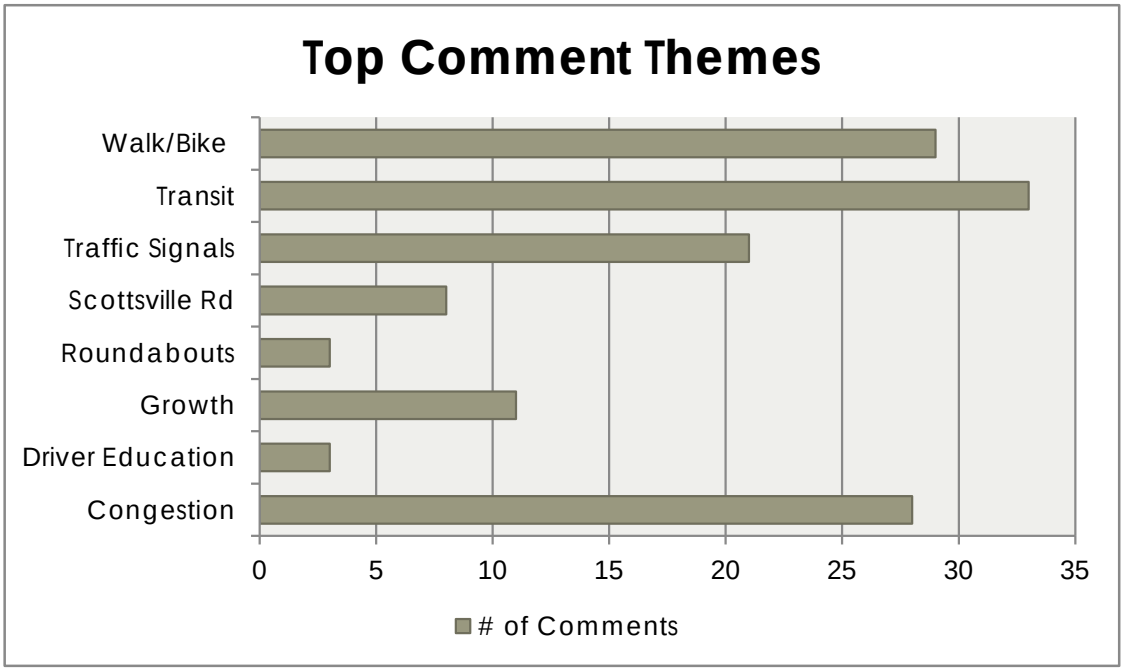


FIGURE 4.3 TOP COMMENT THEMES

An entire summary of the survey results are provided in ***Appendix B***. In addition to the MPO's survey, GO bg Transit issued a customer satisfaction survey to their riders over the same time period the MPO conducted the 2045 MTP survey. The results of this survey are also provided in ***Appendix B***. Together, these surveys will supplement the other resources the MPO uses to establish priority projects, as identified in the following chapter.

The MPO hosted a virtual public meeting near the completion of the draft MTP update. Due to the COVID-19 pandemic and social distancing requirements, the meeting was hosted via Zoom, the virtual meeting platform. A draft 2045 MTP Fact Sheet and associated maps were posted to the MPO website prior to the virtual meeting. Additionally, staff created short videos reviewing the Plan and its contents, also posted on the MPO website. The MPO publicized the meeting through local media outlets, Facebook, and email distribution. This virtual public meeting offered members of the public an opportunity to review a visual analysis of existing transportation trends, socioeconomic data, projected levels of growth through 2045, and the proposed 2045 MTP priority projects. With this, community members were given the opportunity to ask questions and learn more about the future of our transportation system. General questions and comments were collected through the virtual meeting platform and were welcomed for 15-days following the virtual meeting. All materials and public comments are included in ***Appendix B***.

Stakeholder Input

The MPO simultaneously worked with local, state, and federal stakeholders to gather input on the development of the 2045 MTP. Regular updates were provided at the MPO's committee meetings (Bicycle and Pedestrian Advisory Committee, Technical Advisory Committee, and Policy Committee). Additionally, the MPO coordinated with WKU's Topper Transit and GO bg Transit to incorporate transit priorities and future plans into this document.

Letters and/or email correspondence were sent to local, state, and federal planning and resource agencies, as listed in the appendix of the Participation Plan, requesting their input on the future of the transportation system. These agencies were also notified by letter and/or email of the completed draft MTP update available for review and comment. Stakeholder comments are documented in ***Appendix B***.

RELATED TRANSPORTATION STUDIES & PLANS

Over the past five years, the MPO has conducted a number of transportation studies that have influenced the development of many roadway improvement projects throughout the community. These studies and plans have aided in the development of the MTP by contributing to future priorities for the MPO area. Below is a list of these studies. Please reference the links provided to view the studies on the MPO's website.

- Campbell Lane (US 231) Level of Service Study – 2016
- Transit Needs Assessment & Route Realignment Study – 2016
- Multimodal Implementation Plan – 2017
- Plano Road (KY 622) Corridor Plan and Policy Development Study – 2018
    - Plano Road Focal Point Plan – 2018
- Fairview Avenue (KY 234) Safety & Capacity/Level of Service Study – 2018
- Bowling Green Transit | Operational Efficiency & Management Analysis – 2019
- US 31W Bypass Road Diet Feasibility Study – 2020
- Kentucky/Adams Street Improvements Study – 2020
- Interstate-65 Interchange Feasibility Study – in progress 2020/2021

LAND USE PLANS & POLICIES

New development proposals in our community are evaluated by the Planning Commission for compliance with the current comprehensive plan. Our current comprehensive plan, FOCUS 2030, was adopted by the Planning Commission in 2012 and amended in late 2017. The Comprehensive Plan is intended to provide a general blueprint for how our community should grow through the year 2030. The plan incorporates a variety of elements including Future Land Use; Transportation; Community Facilities; Parks and Recreation; Natural and Cultural Resources; Housing and Neighborhoods; and Economic Development. Each element includes relevant

goals, objectives and action items that help to guide the physical development of our community. The Transportation element incorporates goals that support a safe and efficient transportation system, while at the same time supporting growth and economic development in our community. Furthermore, this element contains specific objectives and action items relating to the needs of the MPO and our transportation agencies including the KYTC and the City and County Public Works Departments. Some of these specific objectives and action items are referenced below:

Objective TR-1: Roadway Network - Support the KYTC and the MPO in meeting their responsibilities to plan, fund and build a roadway network which supports sound growth and the mobility needs of the community.

Action TR-1.1: In reviewing development applications, identify the need to retain rights-of-way for roadways depicted in the long-range plans of the MPO and the KYTC.

Action TR-1.2: Identify and bring to the attention of the MPO and KYTC, or alternatively prioritize through the City's or County's Capital Improvement process when possible, those roadway links and intersection improvements not currently included in the long-range plans, but which may be necessary to support the future land use patterns.

Action TR-1.3: In lieu of implementation of currently unfunded and unscheduled road improvements, encourage attention by the KYTC and MPO to cost-effective improvements to address congestion "hot spots" through such means as intersection capacity improvements, signal re-timing and synchronization, dedicated turn lanes, etc.).

Objective TR-3: Pedestrian and Bicycle Mobility - Promote pedestrian and bicycle mobility through an integrated network of sidewalks, paths and trails and through the encouragement of bicycle and pedestrian-friendly streets and land use and development patterns.

Action TR-3.4: Coordinate with the KYTC and the MPO to ensure that bicycle and pedestrian ways are established in conjunction with the construction, reconstruction or other change of any state transportation facility, with special emphasis on those projects that are located in or within 1 mile of an urban area.

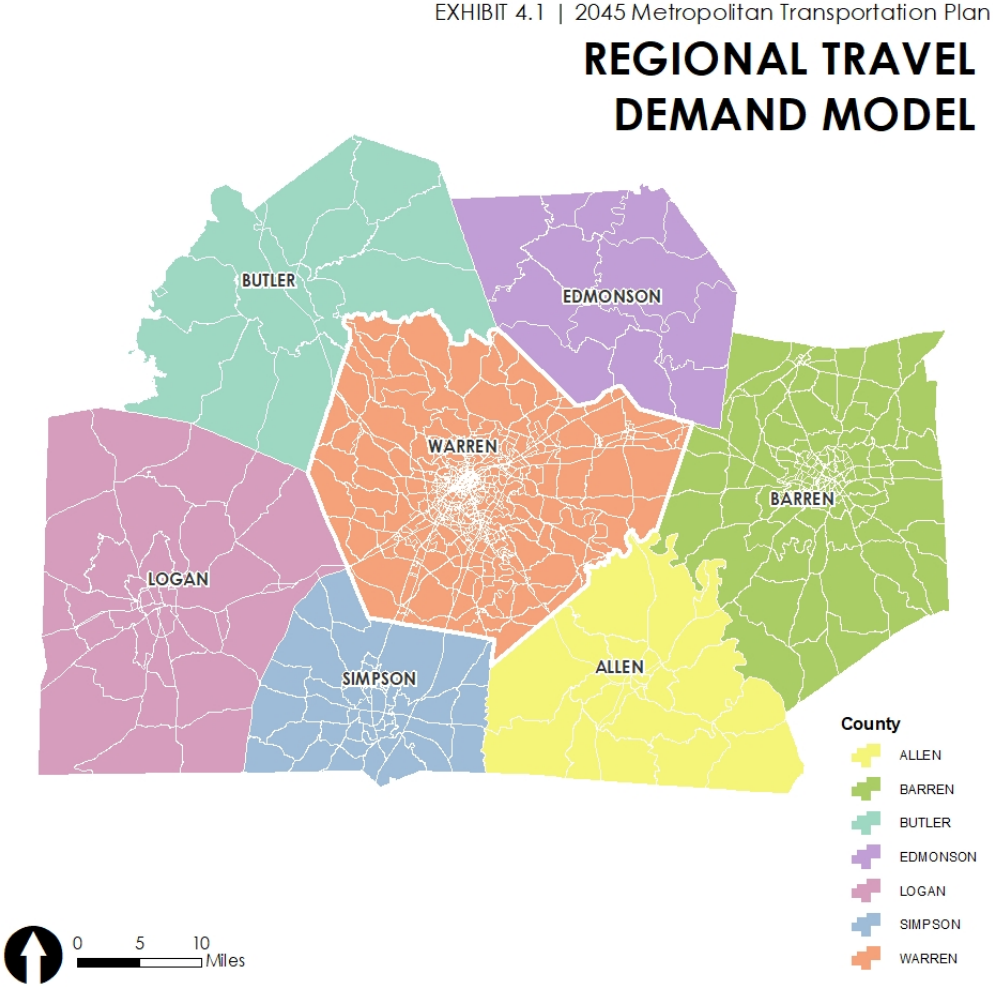
These transportation-related items from the FOCUS 2030 Comprehensive Plan support MPO efforts by encouraging reservation of land for future right-of-way needed for roadway improvements, planning for needed improvements to support future development and promotion of a multi-modal transportation system that supports

growth within our community. The City-County Planning Commission staff further coordinates with KYTC District 3 along with Warren County and City of Bowling Green Public Works Departments to review new development proposals in an effort to minimize their impact and to improve the existing roadway and pedestrian networks, as applicable.

TRAVEL DEMAND FORECASTING MODEL

The MPO and City-County Planning Commission staff worked with the KYTC to develop and calibrate the Bowling Green area travel demand model. A 2018 base year was established with a forecast year of 2045. Together, the agencies worked over the course of 2018 and 2019 to update expected land use and employment trends for the year 2045, to be incorporated into the model. Bowling Green's model includes data from the six counties surrounding Warren County. This regional focus allows the model to account for longer distance trips into and out of Warren County. Counties included in the model are shown in ***Exhibit 4.1*****.**

EXHIBIT 4.1 | 2045 Metropolitan Transportation Plan



The regional travel demand model was used to evaluate current and future population and employment density and growth areas in the Bowling Green area. The model was also used to evaluate current and future system capacity, flows, and areas of congestion. The model uses the base year (2018) existing roadway network to analyze future 2045 "no build" scenarios for the plan. This analysis provides the MPO with a system wide "no build" performance overview for the year 2045.

Using the model, travel demand, in terms of vehicle miles travelled (VMT), is expected to increase by approximately 32% between the base year (2018) and future year (2045). The estimated daily VMT throughout Warren County was approximately 4.1 million in 2018. By 2045, daily VMT in Warren County is expected to increase to over 5.4 million vehicle miles or at a 1% annual growth rate.

The Bowling Green travel demand model also produces estimates of vehicle hours of travel (VHT), which is an estimate of the total time required for all trips during a given day. The model forecasts that VHT will increase by 44%, or 52,000 hours, between 2018 and 2045.

5. Financial Plan & Project Selection

FINANCIAL FORECAST

Federal law requires that MTPs be financially constrained. Financial constraint demonstrates that the improvements in the 2045 MTP can reasonably be expected to be funded if state and federal transportation revenues continue at their present level through the planning period (2021-2045). The MPO conducted a funding analysis in coordination with state and local transportation agencies to estimate these future anticipated revenues. These anticipated revenues and expenditures are best estimates based on current and historical spending trends for the MPO. Future funding of transportation projects is uncertain, therefore the actual expenditures and feasibility of the projects listed herein will be contingent upon future funding actions taken at the local, state, and federal levels.

REVENUE SOURCES

Major revenue sources at the local, state, and federal levels utilized for transportation improvement projects and programs include highway funding sources, transit sources, and local funds. Funding sources may include: Federal Highway Administration, Federal Transit Administration, Kentucky Transportation Cabinet, City of Bowling Green, and/or Warren County. The revenue sources eligible and currently allocated for use within the Bowling Green-Warren County area are identified below:

Federal Transit Programs

- Section 5307 – Capital Projects and Operating Assistance for Transit Systems
- Section 5310 – Enhanced Mobility for Seniors and Individuals with Disabilities
- Section 5339 – Bus and Bus Facilities Program

Federal Highway Programs

- HSIP – Highway Safety Improvement Program
- NHPP/NH – National Highway Performance Program
    - BRO – Federal Bridge Replacement on Federal System
    - IM – Interstate Maintenance
    - NH – Federal National Highway System
- RRP – Safety – Railroad Protection
- RRS – Safety – Railroad Separation
- STPG/STP – Surface Transportation Block Grant Program
    - BRX – Federal Bridge Replacement Off Federal System

- BRZ – Federal Bridge Replacement Local System
- TAP – Surface Transportation Block Grant Set-Aside (Transportation Alternatives Projects)

State Programs

- SP – State Construction Funds
- SPB – State Bonds
- SPP – State Construction High Priority

Local Funds

- CBG – City of Bowling Green
- WC – Warren County
- WKU – Western Kentucky University
- PPP – Public Private Partnerships

HIGHWAY FINANCIAL ESTIMATE

The highway element of the financial plan includes short-range and long-range forecast financing plans to reflect two planning horizons covered within the 2045 MTP. The short-range table of projects generally corresponds with the MPO's Transportation Improvement Program (TIP), the four-year funding and project programming document for the Bowling Green-Warren County MPO area, and the Kentucky State Highway Plan, the six-year programming document for statewide projects. This table (*on page 59*) covers the years 2020-2026. The MTP's long-range funding table of projects covers the remaining years up to 2045 (*page 63*).

Short-Range Financial Plan: 2020 – 2026

The Bowling Green-Warren County MPO is classified as a "small" MPO. As such, it must rely on funding for federal and state projects through Kentucky's Highway Plan. The KYTC Highway Plan is revised periodically by the Kentucky Legislature. During this process, it is expected that the implementation schedules for some projects will, by necessity, be lengthened somewhat. For the purposes of the development of this MTP, it is assumed that it will take the first seven years of the MTP planning period (FY2020-2026) to complete the projects in the current KYTC Highway Plan. The total estimated cost of these projects during the period is $141,173,295. These projects are identified in the following chapter.

Long-Range Financial Plan: 2027 – 2045

Revenue projections for the Bowling Green-Warren County MPO's 2045 MTP are based on assumptions regarding the total amount of federal and state highway funding that is expected to be available for projects statewide and the average allocation of those funds dedicated to the Bowling Green-Warren County MPO area.

Revenue Assumptions

A financial constraint analysis was conducted in order to illustrate, for future planning purposes, forecasts of revenue estimates that could reasonably be expected for the MPO's priority projects for the remaining years of the 2045 MTP. For years 2027-2045, revenue assumptions are based on an analysis of historical expenditures for highway improvement projects and adjusted based on the estimated cost of the short-range projects, as necessary.

Warren County Historical Expenditures

Data for past expenditures of federal and state funding were available for the 27-year period from 1993 to 2019. Amounts spent on construction projects within the Bowling Green-Warren County area ranged from a low of $3,605,904 in 1993 to a high of $56,772,575 in 2002, with an average spending of slightly over $25.2 million per year. The observed variability and significant range in expenditures can be attributed to fluctuating construction activity and the costs of major projects – such as the expense associated with I-65 widening projects.

Average Expenditure Percent Analysis

Additional analysis through coordination with KYTC revealed that the relative percentage of statewide funding expended annually on projects within the planning area ranged from a low of 0.65% to a high of 5.44% - with a 27-year average of 2.41% and an average of 1.9% for the most recent 10-year period. Further, the average statewide spending over the most recent five-year period is 1.67%, which is lower than both the 27- and 10-year average. From these averages, the MPO will estimate that 2.00% of statewide project funds will be allocated to long-range projects (2027-2045) within the MPO area. This percentage represents a slight adjustment of the 10-year average for the fact that Warren County is growing significantly faster than the state as a whole. Application of this percentage to the current statewide construction budget for safety and mobility project types of approximately $560 million per year yields an annual dollar amount of $11.2 million (in current dollars).

Highway Financial Estimate (Year of Expenditure Dollars)

As part of the financial constraint analysis, federal regulations require that all project costs be shown in Year of Expenditure (YOE) dollars. KYTC guidance was used to calculate YOE dollars, and a 4% escalation per year for both costs and revenues was utilized. To calculate YOE costs, current project costs were inflated to the midpoint of the future year interval in which projects are scheduled. The figures in the table below reflect revenue assumptions that have been estimated as described above and adjusted for YOE over the planning periods shown.

TABLE 5.1 | Cumulative Total Highway Revenues 2020 - 2045	
Funding Years	Revenues
2020-2026*	$141,173,295
2027-2032	$97,759,684
2033-2038	$123,697,187
2039-2045	$186,373,770
Total	**$549,003,936**

**The total cost to complete the short-range financial plan projects exceeds the anticipated amount of funding available for Warren County in this timeframe; the plan assumes that additional funding will be made available to complete these projects.*

It is important to remember that state or federal governments cannot independently fund all roadway projects that are required to meet the present and future needs of the community. Local governments will need to increase transportation funding now and in the future to successfully address the transportation issues of the Bowling Green-Warren County MPO. Additionally, local governments must continue to seek private financial participation where transportation improvements are directly necessitated by private development projects.

Forecasted revenue assumptions do not cover the cost of all of the Bowling Green-Warren County MPO's transportation needs as reflected in the online CHAF (*Continuous Highway Analysis Framework)* database. The CHAF database is KYTC's online portal of all transportation projects across the Commonwealth and is utilized in the state's prioritization processes for the development of the highway plans. The database also serves as the "wish list" of projects for each respective area. These projects are highlighted in ***Table 6.2*** on page 68 (*Illustrative Projects*)**.**

TRANSIT FINANCIAL ESTIMATE

The City of Bowling Green Transit System depends on four main sources of funding to support the public transit operations and capital program. The system is in a transition year for FY 2020-21 as it is doing away with in-kind match and will fund the local match with cash moving forward. The City's contribution is largely dependent upon meeting the matching requirements of the federal funding allocation. The four sources of funding for GObg Transit are: (1) Formula allocations from the Federal Transit Administration (FTA), (2) Commonwealth of Kentucky transit funding, (3) City of Bowling Green funding, and (4) system revenue (fares, advertising). These funding sources support the City of Bowling Green Transit system budget (which was $1,625,586 for FY 2019).

The annual estimate growth that the MPO used to project future transit revenue is 1.5%. The annual average growth of the federal formula funds nationally is 2%. The MPO

discounted the growth by 0.5% to be slightly more conservative. This estimate does not take into account new programs being created or one-time discretionary grants. It is estimated that the revenue of the agency will grow on average by 1.0% to 1.5% annually through the year 2045. With this, it is estimated that nearly $52 million will be expended for transit services (planning, capital, operating).

TABLE 5.2 | Cumulative Total Transit Revenues 2020 - 2045

Funding Years	Revenues
2020-2026	$12,082,719
2027-2032	$11,407,620
2033-2038	$12,473,585
2039-2045	$16,033,173

SYSTEM OPERATIONS & MAINTENANCE

The nature of the metropolitan transportation planning process does not lend itself to specifically identifying future system operations and maintenance needs or projects over the period covered by the plan. Nevertheless, it is required that the MTP include system-level estimates of resources that are expected to be available to operate and maintain the transportation system.

State Maintenance

Routine maintenance and operation of the state-maintained roadway network in the MPO area is accomplished by the KYTC through the Highway District 3 Office in Bowling Green. KYTC District 3 also oversees all traffic operations on state-maintained roadways. Over the last 10 years, KYTC annual expenditures for operation and maintenance activities in Warren County have averaged $7.1 million. Approximately 65% of these amounts are applied toward the federal-aid system. For planning purposes, it is reasonable to assume that KYTC maintenance expenditures will be at least $7 million per year over the foreseeable future.

Local Maintenance

In addition to the KYTC operation and maintenance programs, the local governments within the MPO planning area also expend significant resources for the operation and maintenance of local streets and roadways. In a given year, the City receives approximately $1,000,000 of Municipal Aid funding. The City of Bowling Green expends an additional $1,000,000 from its general fund to assist with the street overlay program. The Operations Division spends approximately $80,000 on traffic control, an additional $57,000 on street maintenance and minor overlay, and $170,000 on storm drainage each year. The City has also allocated approximately $500,000 for constructing new sidewalks and $300,000 for greenways-related projects throughout the city of Bowling

Green. Warren County Public Works expends approximately $3,600,000 per year on operations and maintenance. The majority of county road fund expenditures come from fuel tax revenue and state highway moneys.

Transit Maintenance

Maintenance is also a focus for area transit providers. Daily operations of the transit system is the greatest expense, followed by repairs and replacements of the fleet. The City of Bowling Green alongside GObg Transit has estimated (in 2020 dollars) approximately $1.7 million will be spent annually through 2045 for transit operations. Additionally, it is estimated that approximately $654,000 will be expended for maintenance to the transit fleet and services provided in the MPO area.

PROJECT SELECTION

The MPO worked to identify priority projects for the Bowling Green-Warren County area through the year 2045 to address the area's needs and demands. The projects were derived from a variety of sources, as identified below:

- 2040 MTP
- 2020 Highway Plan
- CHAF (*Continuous Highway Analysis Framework* – KYTC's statewide project database)
- Local/Regional Plans
- Corridor/Transportation Studies
- Input from staff, citizens, and local officials

Project Prioritization Process

To develop a financially-constrained transportation plan, the MPO had to prioritize which projects could be completed with estimated financial resources. The MPO's goals established for the 2045 MTP, in addition to federally-defined planning factors, and nationally mandated transportation system performance measures, helped shape the list of priority projects. The list of projects should serve as a recommendation of transportation improvement projects needed for the demands and growth of the Bowling Green-Warren County area through the year 2045.

CHAF Database & SHIFT 2020

Over the course of 2019, the MPO worked alongside KYTC and local officials to develop its recommended projects for inclusion into the 2020 Highway Plan. KYTC's project prioritization for the development of the biannual Highway Plan is done through a process called SHIFT (Strategic Highway Investment Formula for Tomorrow). The MPO utilized the transportation projects identified in the CHAF database to carry out the project prioritization necessary for SHIFT 2020. The project selection criteria and methodology can be viewed in the MPO's SHIFT 2020 Prioritization Plan located in ***Appendix C***. For the development of priority projects listed in the 2045 MTP, the MPO

utilized the SHIFT 2020 priority rankings as the base for priorities listed herein and further refined the priority rankings in the spring of 2020.

In order to maintain financial constraint, some projects ranked in the SHIFT 2020 process were moved up or down in the future year interval based on available funding as determined by the financial analysis and the YOE dollar amounts. The following chapter lists these future projects by future year intervals and includes costs and revenue comparison. The priorities and scheduling of highway projects reflects current conditions of the Bowling Green-Warren County MPO. Priorities and development of projects are likely to change as conditions warrant.

Project Estimates

Updated planning-level cost estimates were prepared for this plan by state and local engineers based upon the latest project scopes and costing information available. Some cost estimates are derived from up-to-date planning studies conducted specifically for the respective projects. Estimated project costs were used by the MPO to help determine which projects might be implemented over the 2045 planning period given expected future revenues.

6. Transportation Priorities

Transportation funding is competitive and limited across Kentucky, meaning that at the local level, priorities must be established in order to meet the many needs of the growing community. The MPO identified goals and objectives, listed in ***Chapter 1***, that set the ground work for building a sustainable transportation system into the future. The pages that follow identify the MPO's priority transportation projects through the year 2045. These priorities are a culmination of the content that has been explored throughout this Plan thus far. The 2045 priorities are flexible as the MPO accounts for a number of uncertainties with local growth, the economy, community needs, and overall transportation trends.

TRANSPORTATION INVESTMENTS

The MPO's 2045 MTP investment strategy is designed to address mobility and congestion management in a variety of ways. The MPO recognizes the importance of building and maintaining transportation infrastructure in a more context-sensitive, efficient, and sustainable way. This also means that the solution to congestion will not necessarily be to widen a roadway, but the investment strategies will look at more cost-effective, creative measures to minimizing congestion and peak hour delays, while improving safety. Some of these measures may include, but are not limited to: implementing access management practices, reconfiguring lane widths and striping, encouraging multimodal transportation options, intersection improvements, among others. The MPO recognizes that personal auto use will continue to be a common mode of travel for many people in the MPO area; however, the MPO sees the value in addressing future travel with a more proactive, inclusive, and sustainable approach. The MPO strives to accommodate vehicular use as best as possible, but seeks to make other transportation modes attainable for those who need or want to use them.

In approaching transportation investments, the following priorities are established:

- Maintain and improve existing infrastructure;
- Seek ways to increase efficiency of existing infrastructure through improved operations;
- Provide more and better transportation choices;
- Be strategic in how and where system capacity is added; and
- When adding capacity and making improvements, ensure that travel capacity is improved for all modes, not just personal vehicles.

The project recommendations and financial plan that follow adhere to these investment priorities.

MTP FINANCIAL PLAN

The 2045 MTP financial plan describes how estimated revenues from local, state, and federal funding sources will be used to maintain and operate the existing transportation system through 2045. The financial plan identifies which capital improvement projects may be programmed over the planning period. The previous chapter discussed how the projected revenue funding was derived and also outlined the project selection process. The projects listed below address the expenditure of those funds.

Short-Range Plan Projects | 2020-2026

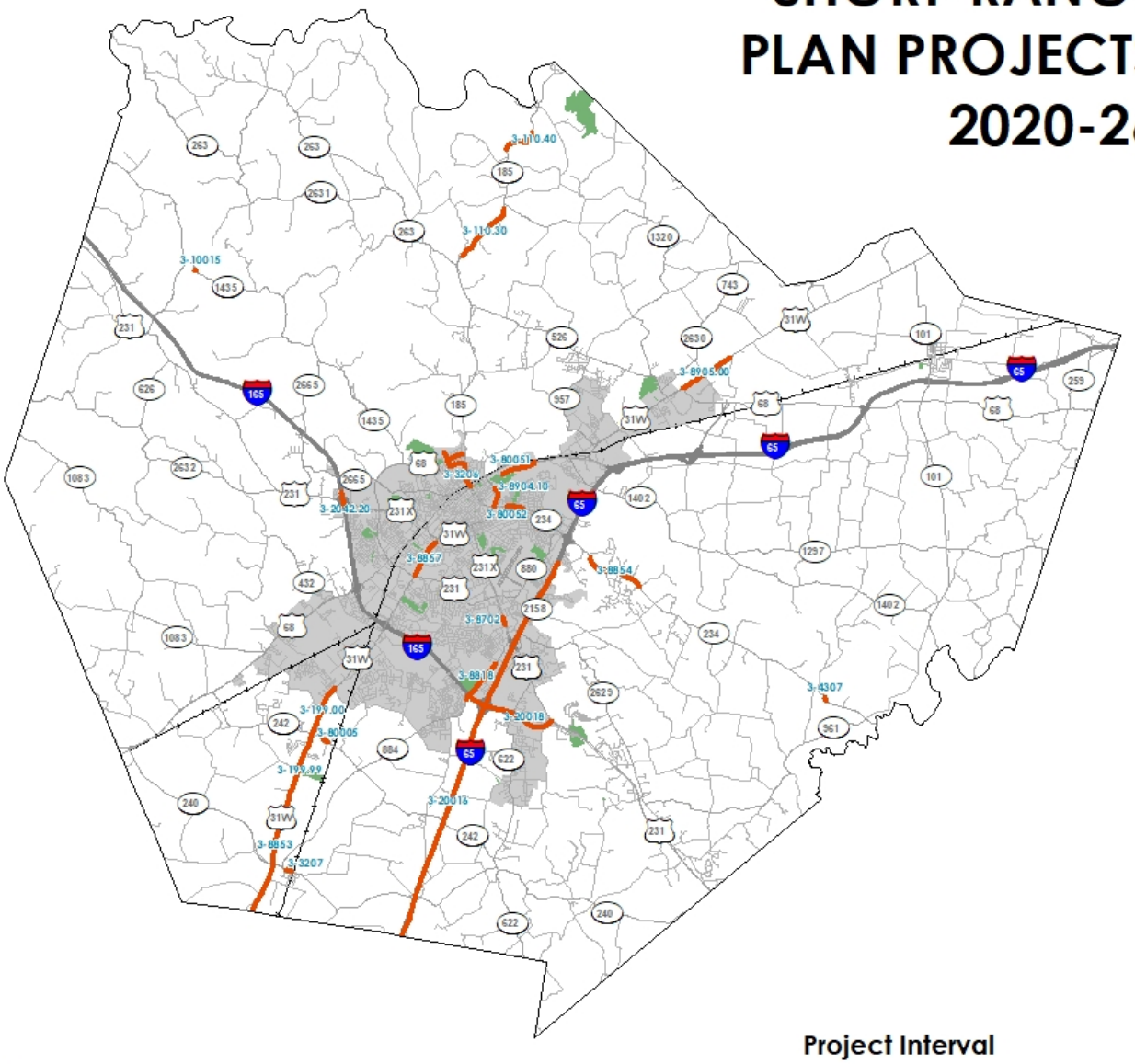
Projects within the MPO's Transportation Improvement Program (TIP) and the Kentucky State Highway Plan are considered short-range, committed projects. Together, these documents identify and program funds to implement each phase of the listed projects over the next six years. The current TIP covers FY 2019-2024, while the 2020 Highway Plan identifies projects through 2026. The 2045 MTP Short-Range Plan Projects, as depicted in ***Table 6.1*** below, corresponds with these documents and covers the years 2020-2026. ***Exhibit 6.1*** maps these projects. The total cost to implement these projects and programs from 2020 to 2026 is $141,173,295. *(Updated project estimates were provided by KYTC in early 2020.)*

TABLE 6.1 | Short-Range Transportation Projects										
MTP ID	SYP ID	ROUTE	DESCRIPTION	TOTAL COST	2020 ($)	2021 ($)	2022 ($)	2023 ($)	2024 ($)	2025 ($)
1	3-110.30	KY-185	KY 185 | 0.24 miles south of Pruitt Rd to 0.16 miles south of KY 1320 | Reconstruction	9,360,000	830,000	8,530,000	-	-	-	-
2	3-110.40	KY-185	KY 185 | 0.22 miles north of Austin Raymer Rd to 0.08 miles south of Ivy Creek bridge | Reconstruction	4,965,000	300,000	4,665,000	-	-	-	-
3	3-199.00	US-31W	US 31W (Nashville Rd) | South of KY 242 (Richpond Road) to Dillard Rd | Major Widening	11,690,000	-	11,690,000	-	-	-	-
4	3-199.99	US-31W	US 31W (Nashville Rd) | Buchanon Park to Chaney's Dairy Barn | Construct pedestrian underpass	450,000	-	-	10,000	-	440,000	-
5	3-2042.20	I-165	I-165 | US 231 (Morgantown Rd) Interchange | Interchange Reconstruction	8,400,000	-	8,400,000	-	-	-	-
6	3-3206.00	GW	West End Bike/Ped | Roland Bland Park to Hobson Grove Park | Construct Greenway Trail	1,030,805	1,030,805	-	-	-	-	-
7	3-3207.00	GW	KY 240 (Woodburn-Allen Springs Rd) Bike/Ped | Fletcher St to Main St in Woodburn | Construct Sidewalk	126,007	126,007	-	-	-	-	-
8	3-3219.00	GW	Numerous State Routes Bike/Ped | ADA Compliance/Sidewalk Rehabilitation completed by City of BG	846,483	846,483	-	-	-	-	-
9	3-4307.00	KY-234	KY 234 (Cemetery Rd) | Between Jack Johnson Rd and Hayes Rd | Install guardrail	25,000	-	-	25,000	-	-	-
10	3-8702.00	US-231	US 231 (Scottsville Rd) | Pascoe Blvd to north of Cave Mill Rd | Major Widening	3,400,000	-	-	3,400,000	-	-	-

MTP ID	SYP ID	ROUTE	DESCRIPTION	TOTAL COST	2020 ($)	2021 ($)	2022 ($)	2023 ($)	2024 ($)	2025 ($)
11	3-8818.00	KY-884	KY 884 (Three Springs Rd) | Natcher Parkway overpass to near Flealand | Minor Widening	16,000,000	-	2,310,000	4,910,000	8,780,000	-	-
12	3-8853.00	US-31W	US 31W (Nashville Rd) | South of intersection with KY 240 (Woodburn-Allen Springs Rd) to Buchanon Park | Minor Widening	17,300,000	-	1,800,000	2,000,000	13,500,000	-	-
13	3-8854.00	KY-234	KY 234 (Cemetery Rd) | Fountain Trace to Roger Porter Road | Reconstruction	14,250,000	-	1,000,000	6,250,000	-	7,000,000	-
14	3-8857.00	US-31W	US 31W (Nashville Rd) | Campbell Lane to Oaklawn Way | Major Widening	12,100,000	-	1,750,000	-	5,800,000	-	4,550,000
15	3-8904.10	US-31W	US 31W Bypass | Park St to Fairview Ave | Minor Widening	7,750,000	-	-	1,500,000	-	1,750,000	4,500,000
16	3-8905.00	US-31W	US 31W (Louisville Road) | US 68 (Glasgow Rd) to Mizpah Rd | Major Widening	7,850,000	-	1,850,000	-	6,000,000	-	-
17	3-10015.00	KY-1435	KY 1435 (Barren River Rd) | Bridge over Gasper River | Address bridge deficiencies	1,250,000	1,250,000	-	-	-	-	-
18	3-20016.00	I-65	I-65 | Simpson County line to KY 234 (Cemetery Rd) | Address pavement condition, both directions.	14,850,000	-	1,350,000	13,500,000	-	-	-
19	3-20018.00	WN-9007	Natcher Parkway | Scottsville Rd through I-65 interchange | Address pavement condition, both directions.	2,200,000	-	2,200,000	-	-	-	-
20	3-80005.00	KY-242	KY 242 (Richpond Rd) | At Richpond Elementary School | Add left turn lane	660,000	400,000	260,000	-	-	-	-
21	3-80051.00	KY-3225	KY 3225 (River St) | Old Louisville Rd split to US 31W (Louisville Rd) | Road Diet	2,690,000	-	-	-	2,690,000	-	-
22	3-80052.00	KY-234	KY 234 (Fairview Avenue) | Cemetery Ln to east of Hayes Ln | Minor Widening	3,980,000	-	-	-	290,000	1,980,000	1,710,000
TOTAL COST				**141,173,295**	**4,783,295**	**45,805,000**	**31,595,000**	**37,060,000**	**11,170,000**	**10,760,000**

EXHIBIT 6.1 | 2045 Metropolitan Transportation Plan

SHORT-RANGE PLAN PROJECTS 2020-26



Project Interval

Short-Range Projects

0 4 8 Miles

Long-Range Plan Projects | 2027-2045

With the assumption that additional funding will be allocated to complete the short-term projects, the MPO anticipates that approximately $214 million (2020 dollars) will be available for new projects and programs in the MPO area from 2027-2045. The table and exhibit on the following pages show how the MPO plans to allocate this anticipated funding to transportation projects and programs over this time period. The following table and exhibit show the long-range plan projects.

TABLE 6.2 | Long-Range Transportation Projects

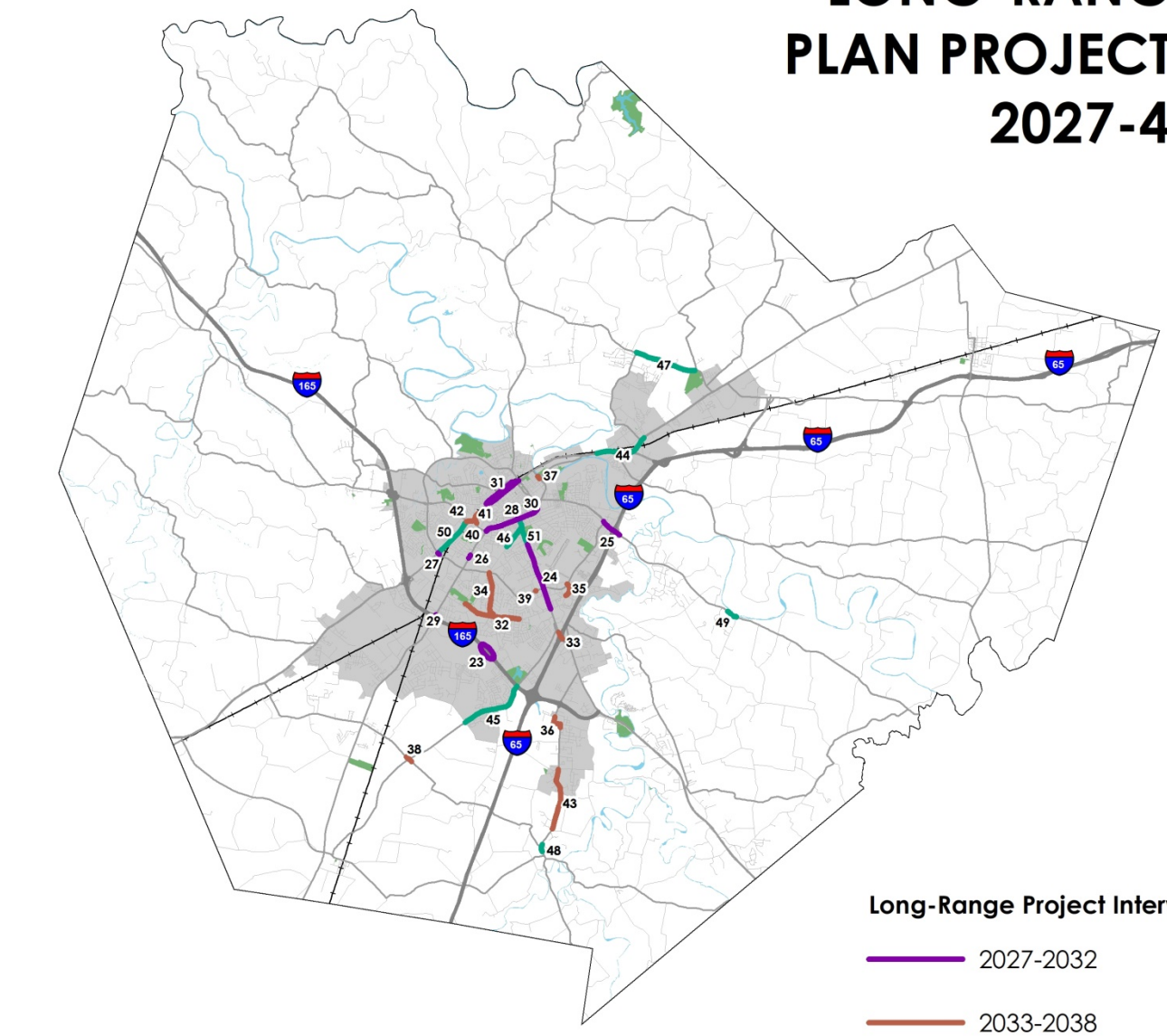
MTP ID	ROUTE	DESCRIPTION	TOTAL COST (2020 $)	2027-2032 ($)	2033-2038 ($)	2039-2045 ($)
23	NEW	New Route on I-165 | Near Elrod Road | Construct new interchange	44,350,000	62,977,000		
24	US-231	US 231/US 231X (Scottsville Rd) | Cave Mill Rd (CS 1432) to South Park Dr (CS 1593) | Access Management & Spot Improvements	3,800,000	5,396,000		
25	KY-234	KY 234 (Cemetery Rd) | I-65 Exit 26 Interchange to KY 880 (Lovers Ln) | Spot Improvements	800,000	1,136,000		
26	US-31W	US 31W (Nashville Rd) | Highland Way to Emmett Ave | Reconstruction/Intersection Realignment	2,550,000	3,621,000		
27	US-231	US 231 (Campbell Ln/Veterans Memorial Blvd) | Intersection with US 68/US 68X (Russellville Rd) | Intersection Spot Improvements	13,000,000	18,460,000		
28	US-31W	US 31W Bypass | Broadway Ave Intersection | Reconstruction	3,300,000	4,686,000		
29	US-31W	US 31W (Nashville Rd) | Exit 6 with I-165 Interchange | Spot Improvements	1,100,000	1,562,000		
30	US-31W	US 31W Bypass | University Dr (Roundabout) to Lehman Ave | Road Diet	120,000	170,400		
31	US-68X	US 68X (Kentucky St/Adams St) | Kentucky/Adams Street Split to US 68 (Veterans Memorial Ln) | Road Diet	125,000	177,500		
32	CS-2281	Cave Mill Rd/Dishman Ln (CS 1434/CS 6010) | Grider Pond Rd to Raintree Dr | Minor Widening	21,500,000		38,700,000	
33	US-231	US 231 (Scottsville Rd) | I-65 Exit 22 Interchange | Spot Improvements	400,000		720,000	
34	CS-1334	Smallhouse Road (CS-1334/CR-1235) | Cave Mill Road (CS-1401) to US 231 (Campbell Ln) | Minor Widening	19,500,000		35,100,000	

MTP ID	ROUTE	DESCRIPTION	TOTAL COST (2020 $)	2027-2032 ($)	2033-2038 ($)	2039-2045 ($)
35	NEW	New Route (Shive Ln) | KY 880 (Lovers Lane) to Shive Ln | Construct New Route	7,620,000		13,716,000	
36	KY-622	KY 622 (Plano Rd) | Collett Rd to Dewey Lake Rd (S-curves) | Spot Improvements	2,000,000		3,600,000	
37	US-31W	US 31W | River St (KY 3225) and State St Intersection | Reconstruct Intersection	500,000		900,000	
38	KY-242	KY 242 (Richpond Rd) | KY 884 (Three Springs Rd) Intersection | Spot Improvements	500,000		900,000	
39	US-231	Gary Farms Blvd | US 231 (Campbell Ln) Intersection and Greenwood Mall Access Rd | Spot Improvements	625,000		1,125,000	
40	US-68X	US 68X (Russellville Rd) | US 231X (Morgantown Rd) to US 231X/US 68X (University Dr) | Reconstruction	3,700,000		6,660,000	
41	US-231X	US 231X (University Dr) | South of Creason St to Ave of Champions/US 68 (Russellville Rd) Intersection | Minor Widening	2,000,000		3,600,000	
42	US-68X	US 68X (Russellville Rd) | WKU Baseball Complex to US 231X (University Blvd)/Ave of Champions Intersection | Minor Widening	2,000,000		3,600,000	
43	KY-622	KY 622 (Plano Rd) | Dye Ford Rd to Larmon Mill Re/Plano-Richpond Rd | Minor Widening	7,950,000		14,310,000	
44	US-31W	US 31W (Louisville Rd) | Old Porter Pike to KY 957 (Plum Springs Rd) | Minor Widening	20,210,000			47,897,700
45	KY-884	KY 884 (Three Springs Rd) | Long Road to I-165 Overpass | Minor Widening	12,730,000			30,170,100
46	CS-1334	Smallhouse Road (CS-1334) | Ridgecrest Way to US 231X (Scottsville Rd) | Minor Widening	10,600,000			25,122,000

MTP ID	ROUTE	DESCRIPTION	TOTAL COST (2020 $)	2027-2032 ($)	2033-2038 ($)	2039-2045 ($)
47	KY-526	KY 526 (Mt. Olivet Rd) | KY 957 (Plum Springs Rd) to KY 1320 (Girkin Rd) | Reconstruction	6,240,000			14,788,800
48	KY-622	KY 622 (Plano Rd) | KY 242 (Richpond Rd) Intersection | Spot Improvements	235,000			556,950
49	KY-234	KY 234 (Cemetery Road) | Pleasant Hill Rd intersection | Spot Improvements	785,000			1,860,450
50	US-68X	US 68X (Russellville Rd) | US 231 (Campbell Ln/Veterans Memorial Ln) to US 231X (Morgantown Rd) | Major Widening	15,000,000			35,550,000
51	US-231X	US 231X (Scottsville Rd) | US 231 (Campbell Ln) to US 31W Bypass | Major Widening	11,250,000			26,662,500
TOTAL COST			**214,490,000**	**98,185,900**	**122,931,000**	**182,608,500**

EXHIBIT 6.2 | 2045 Metropolitan Transportation Plan

LONG-RANGE PLAN PROJECTS 2027-45



Long-Range Project Interval

- 2027-2032
- 2033-2038
- 2039-2045

0 4 8 Miles

Illustrative Needs

Beyond the fiscally constrained MTP priority projects, as listed in the short- and long-range plans above, the plan development process identified additional unmet transportation needs in the MPO area. ***Table 6.3*** below lists the remaining MPO projects that fall outside the financial constraint of this plan. Should additional funding become available during the timeframe of the 2045 MTP, these projects may be considered for inclusion in the financially constrained project list of the MTP. The priority of these projects will be reevaluated during the next MTP update, in five years.

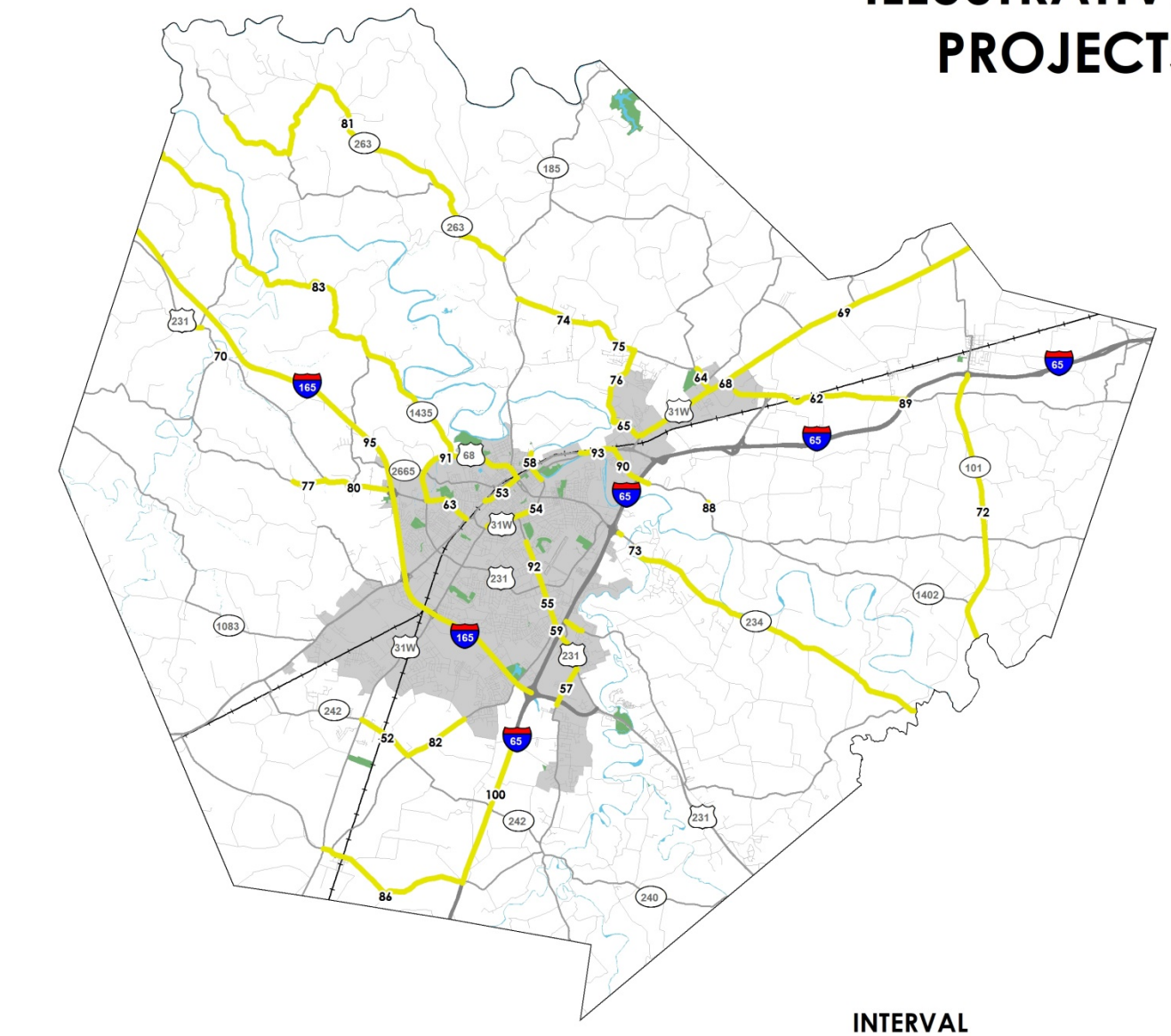
TABLE 6.3 | Illustrative Projects				
MTP ID	CHAF ID	ROUTE	DESCRIPTION	TOTAL COST (2020 $)
53	IP20080751	US-68X	US-68X (Univsersity Dr) | Kentucky/Adams Street split to Veterans Memorial Ln/E 6th Ave/E 7th Ave intersection | Minor Widening	15,000,000
54	IP20070134	US-31W	US 31W Bypass | University Blvd to KY 234 (Fairview Ave) | Reconstruction	6,500,000
55	IP20060205	US-231	Reduce congestion and improve mobility on US 231 between KY 884 (Three Springs Rd) and US 231X/KY880 (Campbell Lane/Lovers Lane) *3-8951 **2016 Highway Plan extended the project to Ashley Circle/Wilkinson Trace	61,500,000
56	IP20040043	NEW	Improve mobility with the Southwest Parkway - New Construction from US 31W to Interstate-65 (Phase II), in Bowling Green. See 2000 Bowling Green transportation plan. *Cost Estimates do not reflect Phase II and need to be updated *Milepoints are not accurate	24,540,000
57	IP20060210	KY-622	Improve safety and mobility on KY 622 from Plano-Richpond Road to US 231.	11,500,000
58	IP20060301	CS-1333	Improve safety and mobility on Beech Bend Road from MP 0 to MP 0.428 to allow better access for pedestrians and vehicles to a major tourist attraction and other points in the area.	11,500,000
59	IP20150078	US-231	Improve access on US 231 from KY 622 to US 231X/KY 880.	44,950,000
60	IP20150074	NEW	Improve access with a new interchange on I-65 at KY-242.	11,100,000
61	IP20010001	NEW	Improve access on I-65 from the L. B. Nunn Parkway to the William H. Natcher Parkway.	485,000,000
62	IP20060204	US-68	Improve safety and mobility on US 68 from Scotty's Way to I-65.	16,000,000
63	IP20060207	US-231X	Improve safety and mobility on US 231X (Morgantown Rd) between US 68 (Veterans Memorial Blvd) and US 68X (University Blvd).	6,550,000
64	IP20060209	KY-526	Improve safety and mobility on KY 526 between KY 1320 and US 31W.	3,650,000
65	IP20060211	KY-957	Improve safety and provide a facility for pedestrians on KY 957 from US 31W to Redbird Trail.	4,500,000
66	IP20060302	NEW	Provide a secondary connection from US 31W to Beech Bend Park to improve access and mobility; ensure the safety and security of the visitors; and maintain the economic viability of this attraction.	7,600,000
67	IP20070133	NEW	Improve access with a new interchange on I-65 at KY 240.	10,600,000
68	IP20070135	US-31W	Provide bicycle and pedestrian facilities in order to improve the safety on US 31W between KY 957 and US 68.	3,300,000

MTP ID	CHAF ID	Route	Description	Total Cost (2020 $)
69	IP20070136	US-31W	Improve safety and mobility on US 31W from US 68 in Warren County to KY 255 in Barren County.	94,000,000
70	IP20070138	US-231	Improve safety of the intersection at US 231 and KY 626 (west).	600,000
71	IP20070139	US-231	Improve safety of the intersection at US 231 and KY 626 (east).	600,000
72	IP20070140	KY-101	Improve safety and mobility on KY 101 between the Allen County Line and I-65.	32,800,000
73	IP20070141	KY-234	Improve safety and mobility on KY 234 between Drakes Creek and the Allen County Line.	45,000,000
74	IP20070143	KY-526	Improve safety and mobility on KY 526 from KY 185 to the eastern intersection of Garrett Hollow Road.	10,420,000
75	IP20070144	KY-526	Improve safety and mobility on KY 526 from the eastern intersection of Garrett Hollow Road to KY 957.	4,400,000
76	IP20070148	KY-957	Improve safety and mobility on KY 957 from Red Bird Trail to KY 526.	8,910,000
77	IP20070149	KY-2632	Improve safety of KY 2632 from Whitestone Quarry Road to US 231 and the KY 2632/US 231 intersection.	3,400,000
78	IP20070252	NEW	Improve mobility on KY 2158 to US 231 by connecting KY 2158 to Cherry Farm Lane.	4,950,000
79	IP20080145	US-31W	Reduce congestion and increase safety and mobility on US 31W at the intersection of 10th Avenue.	1,700,000
80	IP20080146	US-231	Improve safety and mobility on US 231 (Morgantown Rd) between Natcher Parkway and KY 2632 (Hammett Hill Rd).	16,200,000
81	IP20080148	KY-2632	Improve safety and mobility on KY 263 (Richardsville Road) from Amber White Road to KY 185.	64,100,000
82	IP20080149	KY-884	Improve safety and mobility on KY 884 (Three Springs Road) from the intersection with KY 242 to intersection with Long Road.	5,650,000
83	IP20080151	KY-1435	Improve safety and mobility on KY 1435 (Barren River Road) from US 231 to the proposed KY 263 bridge connector in Warren and Butler counties.	17,600,000
84	IP20080152	KY-2629	Improve safety and mobility on KY 2629 (Old Scottsville Road) from KY 2158 (Cumberland Trace Road) to Blue Springs Drive.	3,100,000
85	IP20080153	NEW	Improve access on the I-165 (formerly Natcher Parker) at KY 626 for western Warren County and eastern Butler County.	20,000,000
86	IP20110058	KY-240	Improve mobility on KY 240 from US 31W in Woodburn to the proposed interchange with I-65.	30,500,000

MTP ID	CHAF ID	Route	Description	Total Cost (2020 $)
87	IP20110199	KY-234	Improve safety and mobility on KY 234 east of I-65 from near the Drakes Creek Bridge to the four lane section.	5,850,000
88	IP20110200	KY-1402	Improve safety and address the horizontal and vertical curve alignment issues on KY-1402 from MP 3.3 to MP 3.5.	1,250,000
89	IP20150073	I-65	Improve mobility of I-65 at US 68 to include a full interchange.	7,100,000
90	IP20150076	KY-1402	Improve safety and mobility on KY 1402 (Porter Pike) from US 31W to Grimes Road, including realigning Parker Avenue to the adjacent shopping center entrance.	9,800,000
91	IP20150077	US-68	Modernize US 68 (Veterans Memorial Lane) from US 231/US 231X to US 68/KY 234.	5,900,000
92	IP20150079	US-231	Improve access on US 231X from US 231/KY 880 to South Park Drive.	32,850,000
93	IP20150089	US-31W	Modernize US 31W (Louisville Road) from KY 3225 to KY 1402.	7,050,000
94	IP20150093	NEW	Enhance economic development on the new I-65 Connector by extending it north toward Fairview Boiling Springs Road.	24,000,000
95	IP20150094	I-165	Improve safety and mobility on the Natcher Parkway in Warren County to meet interstate highway standards (I-65/I-66/I-69 Spur Study 2014).	3,300,000
96	IP20170039	KY-234	Improve safety at the intersection of KY 234 (Cemetery Road) and Greenhill Road.	1,050,000
97	IP20190006	US-31W	Improve safety and mobility on US-31W from Old Porter Pike to KY-1402.	0
98	IP20190020	NEW	Improve access with a new interchange on I-65 at Carter-Sims Road.	11,100,000
99	IP20190106	US-31W	Reduce congestion and increase mobility with urban section from Park St. to Louisville Rd. (US-31W) in Bowling Green.	12,250,000
100	IP20190113	I-65	Planning study to determine best location for new interchange on I 65.	-

EXHIBIT 6.3 | 2045 Metropolitan Transportation Plan

ILLUSTRATIVE PROJECTS



INTERVAL

Illustrative Projects

0 4 8 Miles

GROUPED PROJECTS

Transportation planning regulations applicable to the development and content of the MTP and Transportation Improvement Program (TIP) allow that projects that are not considered to be of appropriate scale for individual identification in a given program year may be grouped by function, work type, and/or geographic area. Such projects are usually non-controversial and produce negligible impacts – other than positive benefits for safety, traffic operations, or system preservation. The MTP/TIP includes a list of these types of projects (called Grouped Projects) that may be allocated federal funding through a variety of federal funding programs. These projects are typically identified in an effort to improve existing problems/deficiencies, enhance preservation, or improve safety. They may also be the result of competitive grant awards.

For the reasons noted above, KYTC and FHWA have developed streamlined procedures for incorporating such projects into the MTP/TIP. Individual projects from grouped project categories will be incorporated into the MTP by Administrative Modification as they are defined (in terms of project description, scope, and cost) and approved. Allowing such MTP/TIP changes to be made by Administrative Modification, rather than Amendment, simplifies and streamlines MTP/TIP maintenance and project approval processes.

Grouped project categories utilized by the Bowling Green-Warren County MPO are shown in ***Table 6.4*** on the following page. The list of grouped projects was developed cooperatively with KYTC and FHWA. By listing these project types in the TIP and MTP documents, planning process stakeholders and the general public are informed of the types of potential projects that may be added to the MTP/TIP in the future via streamlined procedures. MTP actions for these projects will not require additional public review, demonstration of fiscal constraint, or a conformity determination (if applicable).

When projects are identified, with estimated costs, and funding decisions (type of funds and year) are made by KYTC (on an annual or ongoing basis), the Cabinet will forward the project to the MPO for inclusion in the MTP/TIP – with a commitment of additional funding within financially constrained balances available on a statewide level. Financial constraint for grouped projects is maintained by KYTC on a statewide level and is demonstrated on an annual basis for the STIP.

TABLE 6.4 | Grouped Projects
HSIP – Highway Safety Improvement Program Implementation
Intersection Improvements for Safety or Efficiency
Guardrail, Median Barrier, and Crash Cushion Projects
Other Highway Safety Improvements
Intelligent Transportation System (ITS) Projects
Traffic Signal System Improvements
Highway Signing
Pavement Markers and Striping
Pavement Resurfacing, Restoration, and Rehabilitation
Bridge Replacement (no additional lanes)
Bridge Rehabilitation
Bridge Inspection
Bridge Painting
Railroad/Highway Crossing Protection
Recreational Trails Projects
Transportation Alternatives Projects
Congestion Mitigation Air Quality (CMAQ) Projects**
Commuter Ridesharing Programs
Bicycle Facilities
Pedestrian Facilities
Park & Ride Facilities
Purchase of New Buses
Rehabilitation of Transit Vehicles
Transit Operating Assistance
Transit Operating Equipment
Small Transit Passenger Shelters and Informational Kiosks
Reconstruction or Renovation of Transit Facilities

***The Bowling Green MPO area is not currently eligible for Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds. However, if Warren County becomes designated as a transportation air quality non-attainment area in the future, local entities would become qualified to submit applications for eligible CMAQ funded projects.*

ALTERNATIVE MODES PRIORITIES

As travel on U.S. roadways continues to rise, the need for alternative solutions to alleviate congestion and improve mobility and safety also becomes increasingly important. In recent years, there has been a growing demand for alternative modes of transportation from bicycling and walking, to public transit, ride shares, and bike shares. As discussed in ***Chapter 1***, there are several emerging transportation trends, some of which are uncertain and only in the beginning stages of development. Regardless of the uncertainty of the future, the MPO recognizes the need to give value to all transportation users and all modes, which means planning for and implementing more bicycle, pedestrian, and transit projects.

The following recommendations for public transportation and bicycle and pedestrian improvements summarize the efforts already made in local plans. These plans are referenced in the text, and can also be viewed on the MPO'S WEBSITE.

Transit Expansion & Improvements

Public transit is integral to a sustainable transportation system and is a critical component of moving many of the MPO area residents throughout the planning area. Many of the current transit users rely on the public fixed-route and para-transit services for regular transportation to/from work, medical appointments, and essential shopping and errands. While the current transit system has its constraints with regards to limited funding, operating routes, and generated revenue, the need for increased and improved transit services is rising. The GObg Transit customer satisfaction survey indicated an overall positive rating of the current services with requests for additional routes and shorter travel time.

Several transit studies have been conducted over the last few years. In particular, the MPO provided oversight of a 2019 study that analyzed both WKU Topper Transit and GObg Transit services and provided recommendations for potential service efficiencies for each agency to implement. A number of recommendations were provided throughout this three-phased study for Topper Transit and GObg Transit as individual agencies, and also collectively. This study and any additional studies post-2019 should be referenced for overall transit system recommendations.

Several general transit focus areas have been identified for public transportation services for the MPO area. These areas include:

- Improve regional transit connectivity and accessibility
- Increase service frequency
- Reduce travel times
- Improve management and operations
- Expand service areas and routes
- Increase ridership
- Capitalize on new revenue streams
- Incorporate advanced technologies
- Improve transit-oriented infrastructure such as: bus shelters, stops and pull-offs
- Maintain a state of good repair for all fleet, equipment, and facilities

City of Bowling Green Transit System

The City of Bowling Green currently contracts public transit services to third party contractors to respectively manage and operate GObg Transit. Projects, programs, and actions for the public transit system are administered and executed in a collaborative effort by and between the City of Bowling Green and the transit providers. The Goals and Objectives stated in ***Chapter 1*** encompass support for public transit improvements and should help shape the framework for future transit improvements. Recent studies

have further outlined specific goals and recommendations for the transit provider in the near- and long-term. These studies can be found on the MPO's website.

The following transit focus areas can be used as a guide in planning for the transit services over the lifetime of this Plan:

- Maintain a state of good repair through proper asset management practices, including monitoring the age and condition of vehicles, equipment and facilities;
- Increase transit ridership by expanding transit coverage, rider accessibility and bus stop proximity;
- Attract choice riders by increasing route frequency, expanding hours to include weekends and evenings, improving bus stop shelters and benches, reducing travel time, and by making buses safe, clean and comfortable;
- Increase regional and local connectivity among transit providers and other mobility options;
- Improve the reliability and safety of transit use; and
- Enhance the transit experience through technology and improved infrastructure delivery.

In addition to following the recommendations laid forth in the studies and other planning documents, it is recommended for the transit provider to conduct a Comprehensive Operational Analysis (COA) every five years to evaluate the transit system. The COA would incorporate data-driven processes to guide how transit resources are allocated and would recommend the most cost effective steps to meet the needs of users. The COA would further identify projects, programs, and actions for a five-year period.

Topper Transit

Topper Transit is operated by Western Kentucky University's (WKU) Parking and Transportation Services department and managed through a third-party contract. Topper Transit is currently utilizing a 5-Year Strategic Plan to extend the useful life of the older transit buses in the fleet and to maintain these vehicles in a State of Good Repair. The 5-Year Strategic Plan refurbishes existing transit bus resources with replacement upgrades to mechanical components (engines & transmissions) and also replaces the interior (seating and flooring). In FY21, Topper Transit plans to replace the two oldest vehicles in the transit bus fleet with two newly refurbished buses that meet the same operating specifications as the existing fleet. The current plan involves replacing existing para-transit vehicles with hybrid or electric models by FY22.

Topper Transit is also focusing on longer term transit solutions to increase sustainability in the Bowling Green community. Preparation is in the beginning stages for transit bus replacement priorities from FY2030 – FY2040. Transit bus replacement strategies will focus on alternative solutions, such as electric or CNG, to power the heavy-duty transit fleet

and the necessary facility infrastructure to support the vehicles. The FY30 – FY40 strategy for the para-transit fleet is to operate 100% on alternative fuels.

Additionally, WKU supports working with the City of Bowling Green to develop a partnership between the City's public transit system and campus' Topper Transit system to generate mutually beneficial operational efficiencies. Such partnership would necessarily maintain a governance structure that supports the independent missions of both systems and would need to enhance service to respective customer bases.

Micro-Mobility

As trends continue to shift, at least for this time period, toward shared mobility services/first and last mile connections, the MPO must consider the myriad of micro-mobility options in the future transportation network. Micro-mobility options vary by place, but given the context of the Bowling Green-Warren County MPO area and its rapid growth, it is reasonable to assume that the need for these types of transportation options will be in greater demand. Micro-mobility options can provide transportation for WKU students living on/off campus, community members wanting to exercise (bike-share), community members without access to a vehicle, and can fill in the gaps where public transportation does not currently provide service. Additionally, the MPO believes there is potential for partnerships with micro-mobility providers to service workers in the County's two industrial parks. The MPO supports the use of bike-share services; however, many leaders have concerns over the safety of the users due to lack of cycling infrastructure across Warren County and the increase of distracted driving. While many of the other micro-mobility options are concentrated in larger cities at this time, the MPO supports the consideration of their use in the future.

Bicycle & Pedestrian Projects and Initiatives

The MPO strives to plan for all modes of transportation, but with limited funding for bicycle and pedestrian infrastructure, many of these projects must come from local funding sources, grants, and/or be included with a roadway project, when applicable. The MPO's Bicycle and Pedestrian Advisory Committee (BPAC) oversees the advisory and planning roles of bicycle and pedestrian projects and programs in the MPO area.

A goal of the 2045 MTP is to accelerate implementation of the MPO's Multimodal Implementation Plan (MMIP) that was completed in 2017 and has been adopted as an element of this Plan update. The MMIP identifies existing system gaps and needed connections, with the primary goal of connecting existing trails, parks, and schools.

Primary focus areas for bicycle/pedestrian projects include:

- Connect gaps in existing greenway trail system
- Improve accessibility of more residents to the bike/ped facilities
- Incorporate wayfinding greenway trail signage
- Ensure new and/or re-developments are walkable and bikeable

- Provide connections to parks and schools
- Better connect the bike/ped network with transit systems
- Provide infrastructure and access to populations without access to vehicles
- Implement off-road greenway trails
- Promote bicycle safety and education

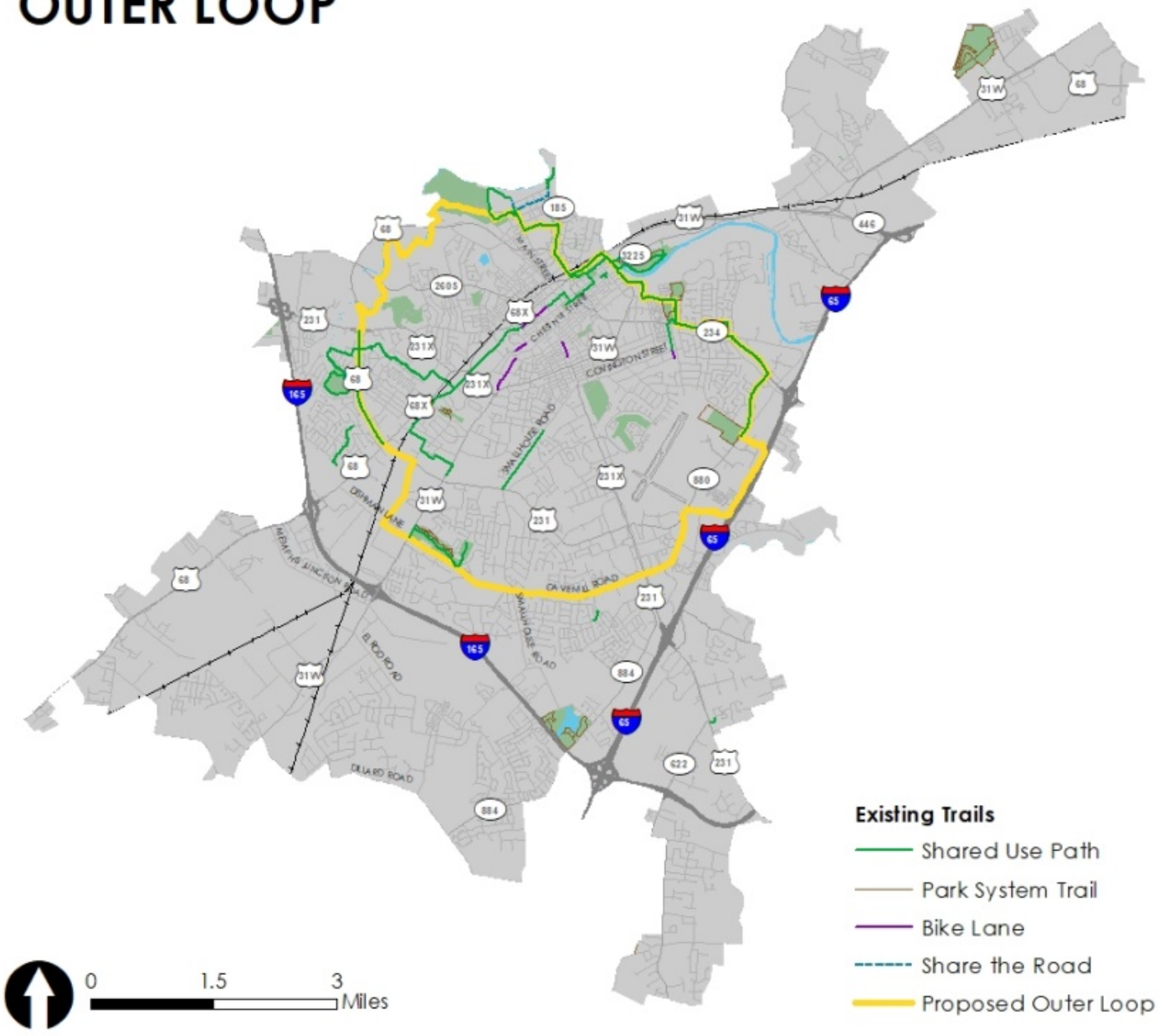
Greenways and Bikeways

The City of Bowling Green is dedicating $300,000 to greenways beginning in 2020. This budgeted amount of funds will be used for greenway system maintenance and on occasion, may be used for trail construction. In early 2020, the BPAC worked closely with the City of Bowling Green to establish a prioritized conceptual "city loop" that would fill in gaps between existing greenways to create a continuous greenway loop around the city. Many of these trails are urban greenways, meaning they are not off-road facilities, but rather an 8-10 foot shared-use path alongside a roadway. The city loop should be prioritized with local funds, grant funds, and any applicable roadway projects.

Additionally, the City of Bowling Green and MPO have collaboratively created a greenways project prioritization GIS tool that provides an objective scoring and database methodology to prioritize greenway/bikeway projects. Factors included in this formula include: connectivity to existing greenways, proximity to various pedestrian generators and destinations, pedestrian/cyclist comfort where applicable (measure of the benefit of getting pedestrians/cyclists out of the road, related to street functional class), access to vehicles demographic, feasibility of construction, and demonstrated need. The conceptual city/outer loop is shown in ***Exhibit 6.4***. Additionally, ***Exhibit 6.5*** represent the accessibility to existing and funded greenway trails within the urbanized area, both of which are focus areas for improving bicycle and pedestrian accommodations over the lifetime of this Plan, as discussed above.

2045 Metropolitan Transportation Plan | EXHIBIT 6.4

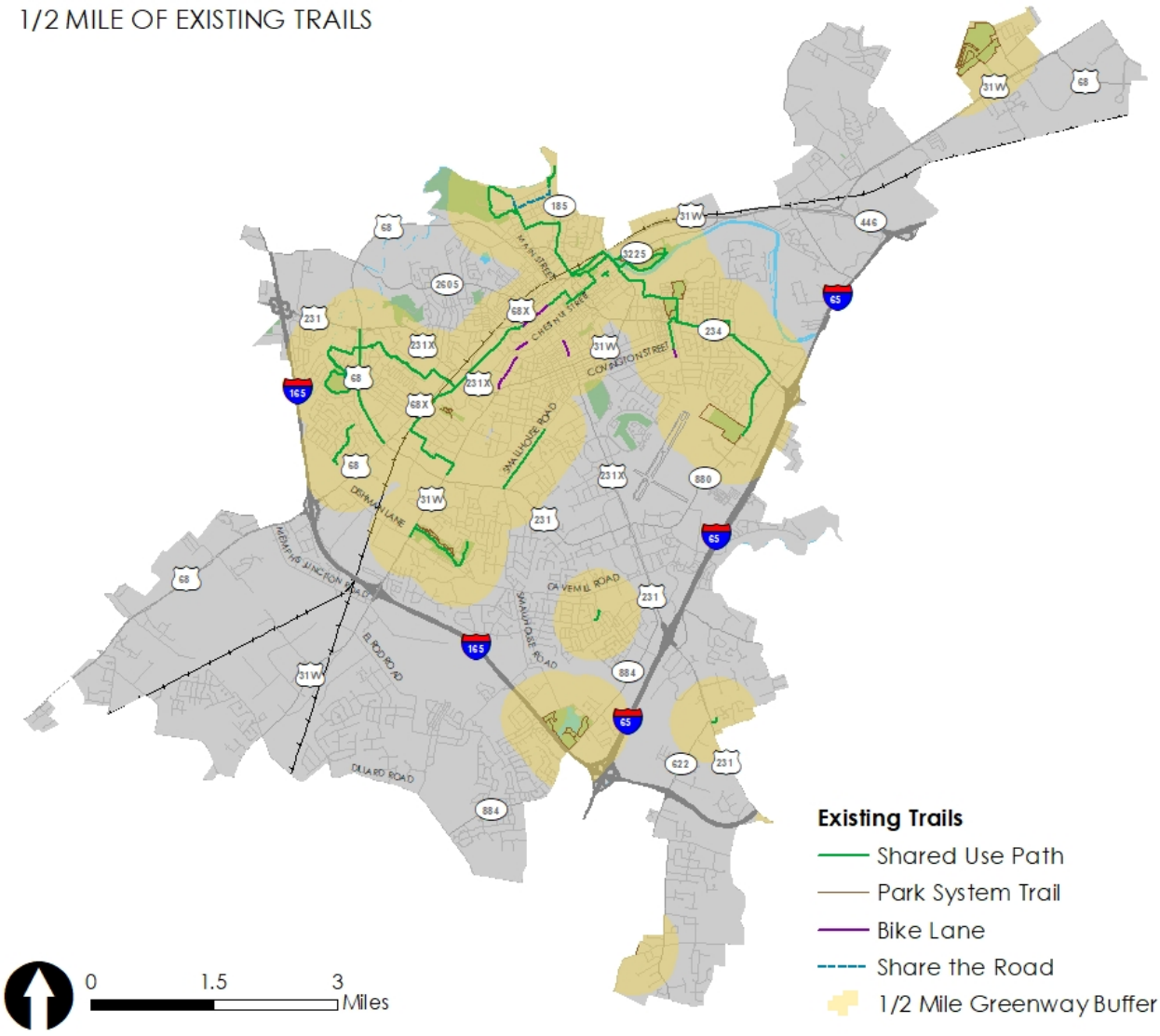
PROPOSED GREENWAYS: OUTER LOOP



2045 Metropolitan Transportation Plan | EXHIBIT 6.5

GREENWAYS ACCESSIBILITY

RESIDENCIES LOCATED WITHIN
1/2 MILE OF EXISTING TRAILS



Sidewalks

The City of Bowling Green allocates $500,000 to sidewalk repairs and construction each fiscal year. The City's 2020 sidewalk network can be viewed in the sidewalk exhibit in ***Chapter 3***. The City utilizes a GIS project prioritization database to rank and propose projects for funding, similar to the greenways tool described above. Sidewalk priorities to be constructed in the City will be generated on an annual basis through the database. The WARREN COUNTY SUBDIVISION REGULATIONS identify sidewalk requirements for all areas of Warren County, including incorporated areas. Sidewalks are only required in residential subdivisions served by sewer and are optional in non-sewered residential subdivisions. Sidewalks are also required for all commercial development, and are optional for industrial development.

MTP FOCUS AREAS

In identifying the MPO's long-range priority projects, several focus areas were considered. These focus areas were intended to serve as guiding principles in selecting projects and should continue to serve as areas to focus efforts, initiatives, and investments into the future.

Accessibility & Connectivity

A connected and accessible transportation network plays an important role in a region's quality of life. A transportation network that links multiple modes of travel and is well connected to a variety of land uses (residential, industrial, commercial, recreational, etc.) provides greater mobility for residents and visitors of the region. A multimodal and well-connected transportation system helps move people and goods throughout the MPO area and beyond. With Bowling Green-Warren County's direct access to I-65 and I-165, the MPO area is situated for efficient movement of goods and people beyond the county boundaries. This enables and encourages the area to thrive in a sustainable and efficient manner. Because of this, it is imperative for the MPO to prioritize meaningful access and connectivity to critical corridors for all modes and travel types.

Connectivity gets at how long it takes to get to one's destination in relationship to the actual distance to the destination. Some subdivisions and/or residential areas for example, have dead-end cul-de-sacs that do not provide direct connectivity to main roads, thus impeding the reliability for roadway users and access for emergency vehicles. The current subdivision regulations require that stub streets be constructed or dedicated easements be established as part of a continuing street plan to provide for access to any adjacent undeveloped tract of ten (10) acres or larger. Likewise, connections to existing stub streets in an adjacent development are required. The FOCUS 2030 comprehensive plan further supports this requirement in the Transportation Element, specifically in Action TR 2.1, outlined below:

> **Action TR-2.1** - Continue to require that all private and public development is undertaken in a manner which promotes connectivity and minimizes traffic congestion on the existing road network, by implementing measures such as (but not limited to) the following:
>
> - Adjacent developments shall provide for internal circulation between them in accordance with the subdivision regulations.
> - At least one stub street should be constructed into each adjacent undeveloped property of 10 acres or more. The design of future alignment of street extensions onto adjacent tracts should benefit the surrounding community. Subsequent development of these adjacent tracts shall connect to the original stub street.

The MPO should continue to work collaboratively with local and state organizations to effectively plan new developments in such a way that encourages great accessibility and connectivity to the infrastructure network.

Safety & Security

Safety and security considerations are interwoven into the MPO's transportation planning process and should be incorporated into any project, program, or initiative conducted by the MPO. These include, but are not limited to:

- Developing strategies that can enhance safety for all transportation system users;
- Continuously gathering and documenting public and stakeholder input on safety concerns;
- Creating policies and design practices that are consistent with safety and security goals;
- Utilizing all available data sources to compile and analyze crash data – identify safety problems, needs, and solutions;
- Pursuing available funding to correct safety deficiencies;
- Marketing, public education, and safety outreach efforts; and
- Engaging with public safety agencies and coordinating incident management plans.

Maintenance & Operations

It is essential to get the most out of the existing and future transportation infrastructure. To this end, the 2045 MTP supports ongoing and expanded system operations and maintenance procedures to achieve a state of good repair. Systemic, routine maintenance of roadways is required in order to maximize function and efficiency. Routine maintenance may include street sweeping, cleaning and repairing drains, and fixing traffic signals. Other maintenance procedures are also required, which cost significantly more and are often prioritized based on need, safety, and roadway use. These procedures include: rehabilitating and repaving surfaces, replacing substandard bridges, and reconfiguring and updating intersections. Various right-of-way maintenance is also needed including curb ramps, sidewalks, signs, signals, pavement markings, street trees and drainage structures, among others. Local and state governments oversee all system maintenance for roadways and right-of-ways within their respective jurisdiction.

Reliability

Transportation reliability is often a struggle in larger metropolitan areas, at peak travel times, and/or with event traffic. FHWA states that travel time reliability reflects the quality and variability of travel time. Poor travel time reliability can be attributed to the aforementioned reasons, but an unreliable system can also be attributed to roadway crashes and congestion. Therefore, focus can be given to reducing congestion through incident reduction, management, response, and mitigation. Travel time reliability

affects more than just roadway mobility; it has trickling effects on the economy as well. Low-cost measures to improve system reliability may include, but are not limited to: traffic signal system upgrades and other intelligent transportation system measures, spot improvements, access management measures, road diets, and/or other minor roadway improvements. In some cases, improving system reliability through these measures may result in slower speeds and longer signal queues, but the benefits of improved roadway safety ultimately result in improved travel time reliability.

Intelligent Transportation Systems

The MPO also supports the strategic use of intelligent transportation systems (ITS) to maximize system capacity and to delay or eliminate the need for more costly roadway improvements. ITS include electronics, communications, or information processing used singly or in combination to improve the efficiency and safety of transportation systems. ITS technologies enhance transportation system operations, especially during peak travel times, and are used to make the transportation network safer and more efficient for the movement of goods and people. Roadway message boards that inform drivers of current weather, traffic, accidents, and/or construction are just one example of the use of ITS technologies.

These systems work best when integrated into an interconnected network, or architecture. ITS Architecture is the framework within which a system of ITS projects can be built. It defines the components of the system and the interconnections and information flow between the components. ITS Architecture has the ability to communicate and improve operations at both a local and regional level.

In planning and implementing future infrastructure projects, ITS technologies should be considered as a solution to improving congestion and safety. ITS improvements can often be a cost-effective strategy to address roadway deficiencies. Generally, ITS applications can be categorized into one of eight general categories. These categories are Commercial Vehicle Operations; Incident Detection/Notification; Transportation System Management and Operations; Safety; Road/Weather Information Systems; Transit; Traveler/Tourist Information; and Planning, Outreach and Delivery. A Bowling Green Incident Management System has been implemented which includes several components including reference markers, emergency management signal pre-emption, coordinated traffic signals, roadway weather information systems (RWIS), automated vehicle location (AVL), radar detection units, and flip down detour signs. Warren County also utilizes a Truck Parking Information System along the interstate. ITS initiatives within District 3 and Warren County are coordinated through the Statewide ITS Architecture. More information about KYTC's ITS infrastructure can be found HERE.

Environmental Mitigation

One of the MPO's goals is to support environmental stewardship. With this, the MPO seeks to plan and program projects and initiatives in such a way to preserve the

natural, cultural, and historic assets of the community, while seeking long-term sustainable transportation improvements. As required by federal law, federally funded transportation projects must undergo an environmental review process that considers the following issues: water quality, wildlife habitat modification, land absorption, noise and light pollution, energy consumption, air pollution, climate change, and impacts to natural and cultural (historical and archaeological) resources.

Transportation projects, from new roadway construction to greenway trails, can have a significant impact on natural, cultural/social, and historic resources. Efforts will be made during the planning and design phases of projects to ensure that potential environmental impacts are avoided or minimized. Areas of natural or ecological significance (wetlands, forests, streams, nature preserves, and endangered species areas) should be avoided in the planning and design of infrastructure projects. Additionally, steps should be taken to minimize negative impacts on the various cultural and/or historic resources within a project area. While there are direct impacts to natural, cultural/social, and historic resources, there are additional impacts from new development that may come as a result of an infrastructure project. These impacts must also be considered in the planning and design phases as well. While detailed environmental analysis is not appropriate for the purpose of the MTP, the MPO consulted with environmental resource agencies to provide an opportunity to review the priority projects listed herein. With this review, the resource agencies may identify any potential mitigation activities, location of or identification of mitigation strategies with the greatest potential to restore and maintain environmental functions affected by the MTP. The list of consultation partners is listed in the MPO's PARTICIPATION PLAN.

While the MPO will seek to limit environmental impacts on natural, cultural/social, and historic resources, the MTP also presses the importance of investing in alternative travel modes and encouraging the use of multimodal transportation. Many of these efforts will be done through bicycle, pedestrian, and transit projects and initiatives. In addition to these efforts, the MPO will encourage the purchase of clean fuel buses and fleets for transit agencies and analyze other alternatives to reducing congestion and delays. The MPO should continue efforts to promote energy efficient planning and creative solutions to reducing single-occupancy vehicular travel.

More information can be found on FHWA's website HERE.

7. IMPLEMENTATION

While funding is competitive at both the state and national levels, the projects herein indicate that with the projected revenues through 2045, the MPO has adopted these projects as high priorities for funding. The Bowling Green-Warren County Transportation Improvement Program (TIP) and Statewide Transportation Improvement Program (STIP) are the official mechanisms through which projects in the MTP are implemented. The TIP and STIP are short-term programs of scheduled transportation improvements. TIP/STIP projects are derived from the priority projects listed within the MTP.

FEDERAL COMPLIANCE

Under current federal transportation planning regulations, each MPO is required as part of its transportation planning responsibility, to address the following ten factors:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase accessibility and mobility of people and for freight;
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
7. Promote efficient system management and operations;
8. Emphasize the preservation of the existing transportation system;
9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation; and
10. Enhance travel and tourism.

Federal regulations also require each MPO to provide citizens and other interested parties with a reasonable opportunity to comment on the plans prior to final approval. Furthermore, as an air quality attainment area, the Bowling Green-Warren County MPO is not required to address related requirements for short range attainment of the National Ambient Air Quality Standards under the Clean Air Act of 1990.

Additionally, each MPO and Local Government Agency (LPA) that receives Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding is

obligated to compliancy with the Americans with Disabilities Act (ADA) and Section 504 of the Vocational Rehabilitation Act (504) Plan. The Bowling Green-Warren County MPO, in conjunction with City and County governments and the local transit agency, GObg Transit, make conscious efforts to meet ADA standards and fulfill the requirements of Section 504 of the Vocational Rehabilitation Act (504) Plan. The Bowling Green-Warren County MPO, by way of Title VI of the Civil Rights Act of 1964 *(49 CFR Part 21)* ensures that no person shall on the basis of race, color, national origin, sex, age, disability, family or religious status be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program receiving federal funds. Please see the MPO's WEBSITE for more information regarding the PARTICIPATION PLAN, Title VI, ADA, and Section 504 compliance.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

The TIP provides an overview of how transportation revenues will be invested within the short-term by state and local agencies that have legal responsibility to build, operate, and maintain the community's highway, street, and public transit systems. TIP projects are derived from the MTP and reflect the investment priorities established in the MTP. Federal law requires TIP expenditures be consistent with the MTP. Inclusion of transportation projects in the TIP is a prerequisite for federal funding. A project must be included in the document in order to receive federal funding in the current year. Highway projects are customarily divided into the phases of planning, design, right-of-way acquisition, utility relocation, and construction. These phases typically occur over a period of years and are scheduled in the TIP in accordance with the project's actual progress and the availability of funding.

The TIP demonstrates a short-range transportation vision for the MPO area and provides a mechanism for requesting federal funds for surface transportation projects. While estimated implementation dates are given for projects in the plan, it should be noted that both project development and the TIP are dynamic in that it has the flexibility to be amended and modified as programs and projects are implemented. A major update to the TIP occurs at least every four years.

Projects in the TIP are included in the Statewide Transportation Improvement Program (STIP). The STIP guides the expenditure of federal funds across Kentucky.

AMENDING THE MTP

MTP Amendments and Modifications may be warranted, and are often needed, due to project changes prior to federal funds being authorized to a specific project. The specifications for amendments and modifications are outlined in the MPO's PARTICIPATION PLAN.

Modifications

Modifications are minor changes and/or corrections to the MTP. No public review and comment period is required for an Administrative Modification. Additionally, transportation projects of the types listed in the ***Grouped Projects Table*** may also be added by an Administrative Modification. Modifications will be posted to the MPO website and distributed to appropriate MPO committees and stakeholder agencies.

Amendments

Amendments are major revisions to the MTP, such as adding or deleting a significant project or major changes to a project; changes to illustrative projects included in the MTP do not require amendments. Amendments require a 15-day public review and comment period. Notification procedures for MTP amendments are outlined in the PARTICIPATION PLAN.