
connecting our region
Lexington Area
Metropolitan
Transportation
Plan 2045

# Chapter 1 Introduction

The transportation system is a significant public asset and represents the largest allocation of public space in our community. Thus, transportation systems shape our community identity and quality of life. Transportation enables us to engage in economic, social and other human activities, allowing our region to sustain, grow and thrive. Rights of way belong to every citizen and the transportation facilities and services conveyed within the right of way help us meet our daily needs for goods, services, education, employment and recreation. Sound investments in an interconnected, multimodal transportation system are the foundation for a strong economy and for the daily human interactions that take place in our community.

Our Region's population is estimated to grow by 42% by 2045. Many wonder how our transportation infrastructure will be able to serve this growth. Additionally, funding for our transportation needs continues to be limited and competitive. Thus, regions are forced to focus on their top priorities and to invest in the most critical transportation projects, technologies and programs.

## 1.1 Purpose of the MTP

The 2045 Metropolitan Transportation Plan (MTP) is a long range plan that communicates the future vision, goals, strategies, projects and programs for transportation in the Central Kentucky Region, with a focus on the planning area of Fayette and Jessamine County.

The MTP is developed through a transportation planning process that facilitates a regional dialogue on transportation needs. It encourages us to examine and learn from our past, understand where we are at present, and determine our best future directions. The planning process is data-driven, performance and goal-oriented and seeks meaningful input from stakeholders and the public within the region.

Key purposes of the 2045 MTP and transportation planning process are to:

- establish a regional vision and goals
- project future demand for transportation services
- guide transportation investment, policies and strategies
- prioritize projects and programs
- consider all transportation modes and intermodal connections
- ensure fiscal balance by estimating costs and reasonably available financial sources for capital investments and the operation and maintenance of the transportation system
- develop plans to preserve existing roads and facilities and to make the most efficient use of our existing transportation system
- reflect public and stakeholder input

## 1.2 About the MPO

Federal law requires all urbanized areas with populations greater than 50,000 to designate a Metropolitan Planning Organization (MPO) to conduct transportation planning activities (Title 23 United States Code, and 49 U.S.C. 450). Urbanized areas with populations over 200,000 are designated as Transportation Management Areas (or TMAs) which carry additional planning and funding requirements. The MPO process is required to be comprehensive, coordinated and continuous (3C's) in developing transportation plans. MPOs that are certified (at least every 4 years) as meeting federal transportation planning requirements are then eligible for federal transportation funding.

### Planning Area

There are currently nine MPOs in Kentucky. The Lexington Area MPO consists of Fayette and Jessamine County and the cities of Lexington, Nicholasville and Wilmore. The MPO land area consists of 458 square miles and has a population of 362,544 persons per the 2016 American Community Survey. In 2010, the U.S. Census designated a small portion of Scott County as part of the Urbanized Area and thus part of the MPO planning area. Scott County chose not to formally participate in the Lexington Area transportation planning process at this time; however, the Lexington Area MPO informally coordinates with Scott County regarding transportation planning issues. For example, there has been significant discussion regarding regional bicycle trail connectivity. The MPO and Scott County will continue to coordinate as the region grows to achieve good regional transportation planning outcomes for our future.

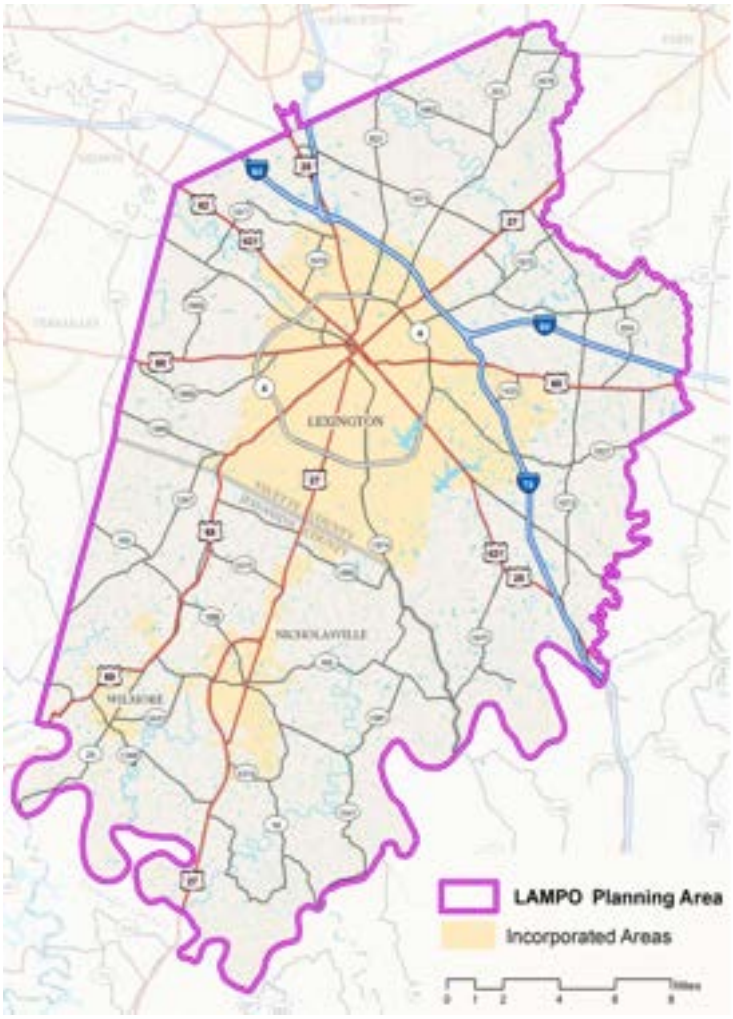



*Exhibit 1.1 – Lexington MPO Planning Area*

## MPO Core Functions

Per federal requirements, the core functions and planning documents of the MPO are listed below. These functions and work products are accomplished through a decision-making Transportation Policy Committee (TPC), several technical sub-committees and technical professional staff (see Exhibit 1.3). These functions include:

1. Establish a fair and impartial setting to make regional decisions
2. Identify and evaluate transportation improvement options
3. Involve the public and key stakeholders
4. Develop and maintain a Congestion Management Process
5. Develop and maintain 4 key planning documents:

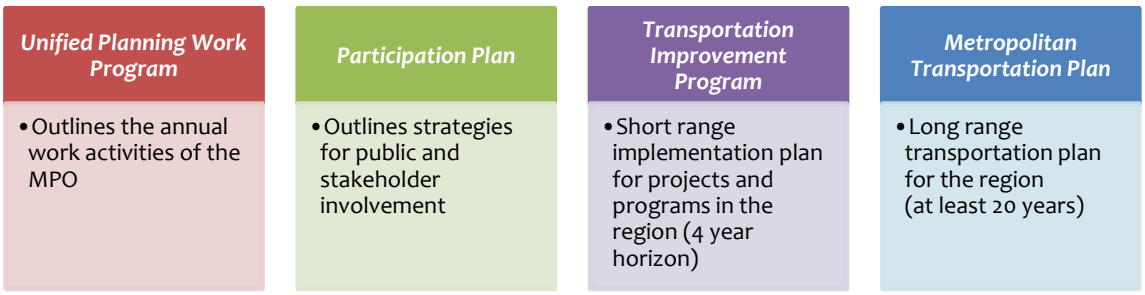



*Exhibit 1.2 - MPO Planning Documents*

To develop the MTP the MPO consults with federal, state and local governments; transit agencies; transportation stakeholders and other agencies with a role in transportation planning. The MPO also engages the public and local officials to ensure transportation policies, plans, projects and programs move the region forward based upon mutually agreed upon goals and objectives. Much of this work takes place through committees, including the Transportation Policy Committee.

## Transportation Policy Committee (TPC)

The TPC is the policy and decision-making body for the Lexington Area MPO. The TPC is comprised of elected and appointed officials from the City of Lexington, Nicholasville and Wilmore; Jessamine and Fayette County; Lextran; Federated Transportation Services of the Bluegrass and the Kentucky Transportation Cabinet. The TPC has advisory (non-voting) members from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA).

## Transportation Technical Coordinating Committee (TTCC) & Subcommittees

The Transportation Technical Coordinating Committee (TTCC) exists to enhance consultation among transportation and community stakeholders and to advise the TPC on technical matters. Two subcommittees and two working groups of the TTCC provide input on specific transportation issues:

- Bicycle/Pedestrian Advisory Committee (BPAC)
- Congestion Management (& Air Quality) Committee (CMC)
- Pedestrian Safety Working Group
- Project Coordination Team

**Lexington Area MPO**
**Transportation Policy Committee**
**Chairman: David K. West**
**Jessamine County Judge Executive**

**Lexington-Fayette Urban County Government:**

Mayor Linda Gorton

**Fayette County, Kentucky:**

Judge Executive Don Blevins Sr.

**City of Nicholasville, Kentucky:**

Mayor Pete Sutherland

**City of Wilmore, Kentucky:**

Mayor Harold Rainwater

**LFUCG Council Districts 1, 2, and 6 Representative:**

Councilmember James Brown

**LFUCG Council Districts 3, 5, and 11 Representative:**

Councilmember Jennifer Reynolds

**LFUCG Council Districts 4, 7, and 8 Representative:**

Councilmember Fred Brown

**LFUCG Council Districts 9, 10, and 12 Representative:**

Councilmember Amanda Mays Bledsoe

**Vice-Mayor / Councilmember-at-Large:**

Vice-Mayor Steve Kay

**Councilmember-at-Large:**

Councilmember Chuck Ellinger II

**Councilmember-at-Large:**

Councilmember Richard Moloney

**Lextran Chairman or Representative:**

George Ward, Chair of Board
Carrie Butler, Lextran General Mgr.

**KYTC Sec. of Transportation or Representative:**

Greg Thomas, Secretary of Transportation
Barry House – Secretary's Representative

**Non-Voting Members:**

**FHWA:** Thomas L. Nelson, Jr. Div. Administrator
**FHWA Representative:** Bernadette Dupont

**FTA:** Yvette Taylor
**FTA Representative:** Aviance Webb

*Exhibit 1.3 – MPO Transportation Policy Committee Structure*

## 1.3 The Process

The MTP must be updated every five years and cover at least a twenty year period. The Lexington Area MPO's 2045 MTP covers a 27-year planning period from 2019 to 2045. The MPO's approach to developing the MTP and ongoing transportation planning activities included steps to:


### MTP Approval

The MPO Transportation Policy Committee (TPC) directs the development of the MTP and formally approves the plan following public and stakeholder input. A copy of the TPC 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 5 years and may be amended or modified by the TPC, providing a direct and continuing role in project programming.

### MTP Amendment

Amendments to the MTP are major revisions that include adding or deleting a significant project or major changes to a project (including design concept and scope). Amendments require public review and re-demonstration of fiscal constraint. The notification process for public and stakeholder input for MTP Amendments are outlined in the MPO Participation Plan.

### MTP Administrative Modification

Minor changes to phasing, costs, funding sources, or estimated project dates within the MTP may be completed as Administrative Modifications per the MPO Participation Plan. Projects types listed in Grouped Projects (Appendix B) may be added by Administrative Modification.

## 1.4 National, Regional and Local Goals

The Lexington Area MPO planning process and the MTP consider certain national goals. The current transportation reauthorization bill entitled "Fixing America's Surface Transportation Act" (FAST Act), outlines required considerations when developing local and regional goals, plans, programs and priorities. In addition to these planning factors, FAST Act stipulates performance-based goals and measures for states and MPO planning areas.

**FAST Act Planning Factors**

A. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.
B. Increase the safety of the transportation system for motorized and non-motorized users.
C. Increase the security of the transportation system for motorized and non-motorized users.
D. Increase the accessibility and mobility of people and for freight.
E. 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.
F. Enhance the integration and connectivity of the transportation system, across and between modes, people and freight.
G. Promote efficient system management and operation.
H. Emphasize the preservation of the existing transportation system.
I. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
J. Enhance travel and tourism.

In 2009, The Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD) and the U.S. Department of Transportation (DOT) formed a Partnership for Sustainable Communities to help communities improve access to affordable housing, more transportation options and lower transportation costs. They established "livability principals" that were adopted by the TPC in 2011. The MTP 2045 continues a commitment to these principles.

**Livability Principles**

**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.

**Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.

**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.

**Support existing communities.** Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

**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

**Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe and walkable neighborhoods—rural, urban or suburban.

Considering local input and the FAST Act goals and emphasis areas, the MPO has set forth the following goals and objectives for the Lexington Area. These establish a foundation for MTP projects, programs and investments moving forward.

## Transportation Goals

- Provide for safe travel for all users
- Provide access, choices and equity
- Provide connectivity within and between modes
- Be efficient, reliable, resilient and well maintained
- Support economic vitality and competitiveness
- Contribute to community character
- Enhance the environment
- Support health and wellness

## Objectives

- Reduce fatalities and injuries by identifying hazards and conflicts within and between modes and by implementing safety improvements.
- Remove barriers to travel for all modes by investing in projects that increase connectivity of streets, sidewalks, bikeways and transit service.
- Adopt a "fix it first" approach to transportation investment.
- Maximize existing infrastructure by targeting investments to address bottlenecks, manage congestion and improve travel time reliability.
- Invest in a range of travel choices, tools and technologies that reduce congestion including access management, bicycle and pedestrian facilities, intelligent transportation systems and transit improvements.
- Reduce single occupancy vehicle use by encouraing ride-sharing, carpooling and vanpooling.
- Invest in public transit initiatives that strive to increase transit ridership.
- Coordinate land use, urban design, transportation and planning activities to make travel more efficient and accessible.
- Provide walkable, transit-oriented transportation corridors.
- Ensure access to jobs, education, goods and services for all citizens including underserved populations, people with disabilities, youth and seniors through investments in public transit, para-transit and other mobility services.
- Ensure projects contribute to community character and are context-sensitive including appropriate design speeds, landscaping, public art, streetscape elements, preserving view-sheds and other cultural or historic resources.
- Facilitate a regional dialouge on transportation needs and solutions.
- Promote the use of efficient travel modes, fuels, vehicles and other innovative technologies to improve air quality.
- Consider the impact of transportation investments and projects on the health and wellness of communities and people.
- Consider the impact of transportation investments on the environment including air and water quality.
- Ensure economic vitality through reliable and efficient goods and freight movement into and out of the region via roadways, railways and air.
- Ensure economic competitiveness by providing more livable, walkable, transit-oriented communities that attract employers and a quality workforce.
- Support tourism by providing accessible and multimodal transportation systems.
- Monitor current and changing attitudes, trends and travel behaviors.

## 1.5 Trends in Transportation

Similar to most urbanized areas "traffic" is among the top complaints of people in the MPO region. There is little doubt that being stuck in traffic is frustrating, expensive and inefficient in many ways. However, traffic can be a positive indication of an area's economic growth. How a community chooses to address travel demand (or "traffic") and facilitate the movement of goods is critical to sustaining good economic growth. Many communities have come to the realization that building out of congestion, primarily through new and widened roadways, can ease the pain of traffic in the short term, but not in the long term, and that continued expansion is not sustainable financially or in keeping pace with population growth.

The population in the MPO area is expected to grow by 42% and reach over 500,000 by 2045. With this growth, we know we will need to improve on our transportation system and continue to focus on maximizing efficiency and on stabilizing and reducing personal auto use and vehicle miles of travel. This requires investment in a broad range of strategies and improvements including:

- Improving the capacity of the transportation system to serve all modes of travel
- Intersection, interchange and corridor modernization and upgrades (better or innovative designs) to provide more efficient operation
- Intersection or bottleneck improvements (turn lanes, improved signal coordination)
- Improved connectivity and access management
- More and better sidewalks and crossings
- More and better bicycle facilities
- Coordinate with employers and schools to reduce vehicular trips
- More transportation options for all segments of the population, including transit dependent and low income groups
- Transit system expansions to improve local service and regional transit to serve growing satellite communities
- More and better operations and maintenance to maximize safety and efficiency
- Safety improvements and programs
- Support ridesharing, ride hailing and other mobility services
- Support innovative technologies such as connected and automated vehicles
- Provide transportation system users with needed information

Furthermore, the Lexington Area MPO finds ourselves in the midst of rapidly changing and uncertain times, where innovations and emerging technologies continue to change transportation norms and have the potential to reshape our transportation system and our communities. There are many passionate debates in transportation circles about where future technology breakthroughs such as mobility services, connected vehicles (CVs) and autonomous vehicles (AVs) will lead. Will there be more traffic or less traffic? Safer or less safe streets? More car-oriented or human-scaled cities? Less parking demand but more curb-side demand?

"Mobility as a Service" (MaaS) is one recent trend that is changing the way people view transportation and personal mobility. MaaS describes a shift away from personally-driven and owned automobiles and toward mobility options that are consumed as a service. MaaS includes a myriad of (often private) service providers including ride sharing, e-hailing services, bike-sharing and electric scooter programs, car sharing as well as on-demand bus/transit services. This is enabled by smart phone technologies that allow users to seamlessly hail rides or "rent" vehicles from a variety of sources. The MaaS trend will be further amplified by the anticipation of fleets of self-driving cars, which put in question the economic benefit of owning a personal car over using on-call services, which are widely expected to become significantly more affordable when cars can drive autonomously.

The current debate about autonomous vehicles (AVs) and the impact they will have on our daily lives is unprecedented. Some futurists believe AVs will be an exciting age for cities where parking lots and garages for privately owned cars will disappear and better land uses for people, such as parks, playgrounds and housing, will replace them, and that traffic congestion will be thing of the past. Others believe that AVs will give us a whole new generation of problems like empty cars driving aimlessly, clogging roads in wait of their next fare.

Some optimists believe autonomous vehicles will be commonplace in a few years comparing it to the rapid advance of computer, internet and smart phone technology. However, given significant public safety concerns and inadequate enabling legislation, it is likely it will take a little longer than some think. Regardless, it is clear that change is coming and it is coming faster than expected. Automated and connected vehicles will no doubt affect the economy, land use decisions, data sharing, pricing, safety, available travel options, congestion, customer service, retail establishments, employment and many other aspects of our daily lives.

Irrespective of the projections about how fast these technologies will come, the time to plan for them is now. Many cities are pursuing "people first" policies in anticipation of MaaS, AV and CV technologies furthering our reliance on single occupancy vehicles and fear that they will amplify the dominance of vehicles in the urban landscape. While there are these and many other unknowns, what is clear is that the Lexington Area MPO needs to strive to be proactive in monitoring and anticipating these changes and to leverage them for their positive attributes and minimize their negative effects.

# Chapter 2 Our Past, Present and Future

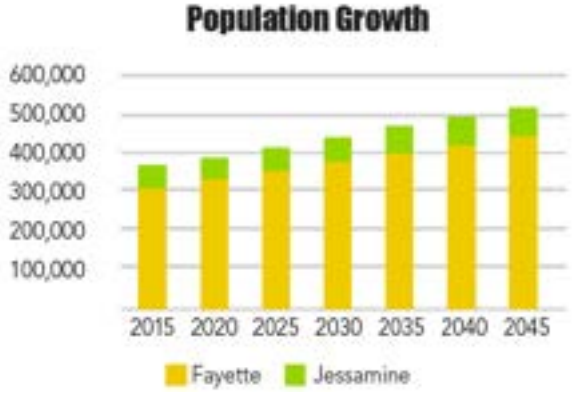
Examining our region today and anticipating future needs helps inform the MPO and decision-makers on how transportation investments should be made over the coming years. When developing the MTP, we ask ourselves where growth has occurred in the past and where it is expected it in the future. What are the current population trends and how will they change over time? How and where do people travel now and how might travel patterns differ in the future? What is the current condition of our transportation infrastructure? Where do we have or expect deficiencies? What are the needs of the region and the transportation network both now and in the future? How does the transportation system impact our environment and our region's safety and security?

## 2.1 Population Trends

Travel demand is correlated to the number of people living in a region, their employment status, age, household size and income. Looking at the past and present composition of our population and our changing demographics can help us understand current travel patterns and predict how travel demand or preferences may change in the future.

### 2.1.1 Population Growth

Each person in a region contributes to the overall demand for travel, whether traveling to and from work, school, running errands, shopping or for recreation and entertainment. The total population for the MPO area is over 362,000 with 86% living in Fayette County and 14% residing in Jessamine County. Over the last few decades the MPO's population has increased by nearly 45,000 people for each 10-yr census period, equivalent to a 35% increase in residents from 1990 to 2010. By 2045, over 500,000 people (42% more than today) are expected to live within the two-county region.



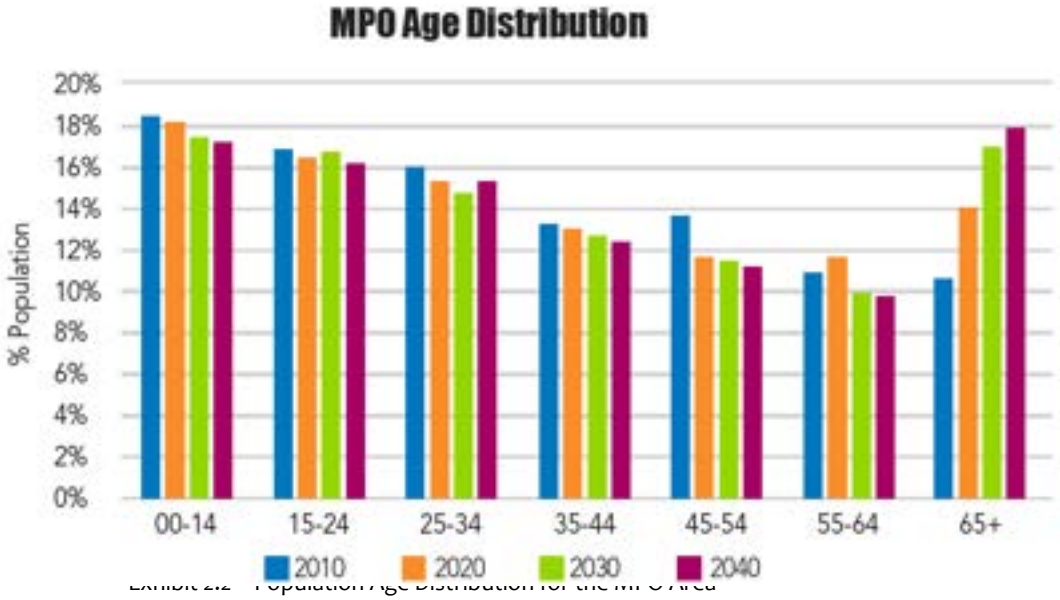

| MPO Population in 2016 | | | | |
|---|---|---|---|---|
| Region | Fayette | Total % | Jessamine | Total % |
| 362,544 | 311,529 | 86% | 51,015 | 14% |

Exhibit 2.1 – Total Population & Population Growth for the MPO Area
Source: 2016 American Community Survey (5 yr. Estimate) & Kentucky State Data Center

### 2.1.2 Age Distribution

A person's age correlates to the number of trips they take in any given day. For example, people who are employed and have children living at home generate a greater number of trips per day. Whereas, a student living on a college campus or a retired senior generate fewer trips.

The age structure of the MPO region is changing, primarily by growing older than it once was. Historically, people aged 35 to 44 (considered to be in their peak travel/driving years) represented a significant percentage of the population. Moving forward, this age group will comprise only 13% of the population compared to 23% in past decades. Younger ages entering their peak driving years during the MTP planning period are also holding steady and/or shrinking. Furthermore, in 2045 a much larger percentage of the population will be aged 65 and older, comprising 18% of the population in 2045 compared to 13% today.




Source: US Census & Kentucky State Data Center

### 2.1.3 Households

The number of households and average number of people living within a household is also a predictor of travel demand. Greater numbers of households and larger household sizes equate to more trips. According to the 2017 National Household Travel Survey, each household generates an average of 8.6 person trips per day and 5.1 vehicle trips per day (equivalent to just over 770,850 vehicle trips per day for the Lexington Area MPO region in 2015).

In 2045, it is estimated that just over 500,000 people will live in the region, residing in over 224,000 households. This represents a 49% increase in the number of households by 2045.

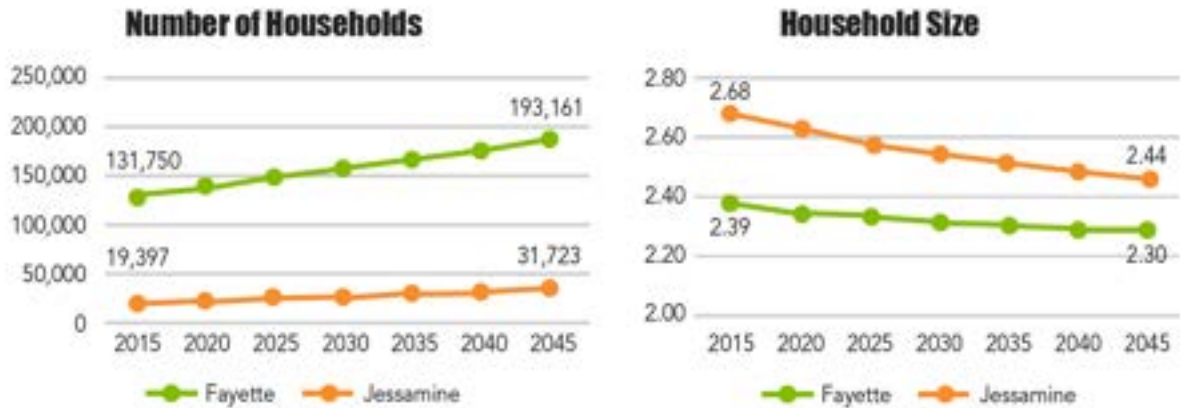



Exhibit 2.3 – Number and Size of Households in the MPO Area
Source: US Census & Kentucky State Data Center

However, the distribution of households by household size has shifted over the years. Although the overall population and number of households in the MPO area continues to grow, household size has slowly but steadily declined (similar to national trends). These smaller households will be comprised of younger and older generations than in the past, which tend to generate fewer trips per person.

### 2.1.4 Labor Force

The size of the labor force and the number of people employed in a region is a strong predictor of travel rates. Within the MPO region, the percentage of residents in the labor force has risen from 56% in 2000 to 61% in 2016 (86% of the region's labor force resides in Fayette County and 14% in Jessamine County). Note: The labor force represents those living in, but not necessarily working in, the MPO region and the eligible labor force includes workers 16 years and over.

| MPO Labor Force | Eligible Labor Force | Labor Force Participation | Labor Force Percentage |
|---|---|---|---|
| Fayette | 255,613 | 156,659 | 61% |
| Jessamine | 40,429 | 22,840 | 56% |
| MPO Total | 296,105 | 179,499 | 61% |

Exhibit 2.4 – Population and Labor Force
Source: 2016 American Community Survey (5 yr. Estimate)

In addition to the labor force residing in the MPO area, it is estimated that over 201,000 people work in the MPO region (either living in the MPO area or commuting into the MPO area). Employment within the two-county area is expected to grow to over 243,000 by 2045. The following section illustrates the commuting patterns of these regional employees and commuters.

## 2.2 Commuting Trends

Commuting to work or school represents just 1 of 4 trips taken by an individual each day; however, it is often the longest trip of the day and occurs during peak travel periods (i.e. when the transportation system experiences the greatest demand). Thus, particular attention is paid to peak hour commuting patterns. This section explores commuting trends in the MPO including where people go, how they get there and how long it takes them.

### 2.2.1 Commuting Patterns

Lexington is a major employment hub for the Bluegrass area with just over 500,000 people living the 6 county metropolitan statistical area (2015 ACS). Jessamine County and Nicholasville are a fast growing county/city within that area experiencing steady employment growth. Estimates from the 2015 ACS indicate that of the 91,573 people that work in Fayette County but live elsewhere, only 36,000 live in directly adjacent counties. The counties with the largest influx of workers into Fayette include 9,243 workers from Jessamine County, 7,943 from Madison County, 7,631 from Scott County and 7,080 from Jefferson County.

Seventy percent of the labor force living in Fayette County (93,241 people) also work in Fayette County. Thirty percent (nearly 39,000 people) work outside of Fayette County. Forty-five percent (nearly 18,000) work in immediately adjacent counties with major workplaces including Toyota in Georgetown, state government offices in Franklin County and various locations in Jessamine County. Jefferson County had the highest number of employees who live in Fayette County but work outside of the county (7,907 people)

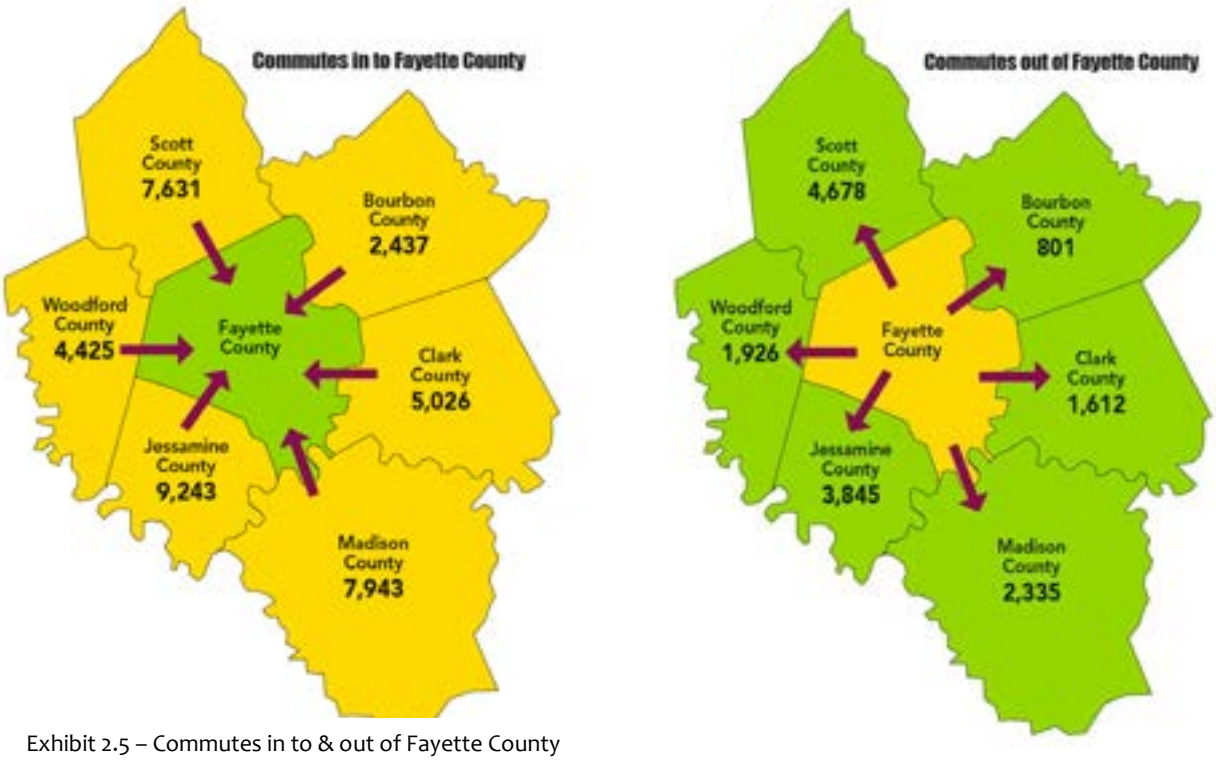



Exhibit 2.5 – Commutes in to & out of Fayette County
Source: MPO Travel Demand Model

Commutes into and out of Fayette County primarily take place along the major arterials leading into and out of Lexington. As population and employment growth continues into the future, these major arterials will continue to serve these commuting patterns at the regional level.

Seventy-two percent of the workforce living in Jessamine County works out-of-county each day. Ninety percent work in directly adjacent counties. Out of over 15,000 out-of-county workers, sixty-two percent are commuting to Lexington, primarily along US 27 (Nicholasville/Lexington Road) and US 68 (Harrodsburg Road).

The 2015 ACS estimated there are just over 10,000 regular commuters into Jessamine County from the region, of which almost 6,000 (55%) commute from directly adjacent counties. Thirty-eight percent (nearly 4,000) of commutes into Jessamine are from Fayette County. Nearly 6,000 people both live and work in Jessamine County.

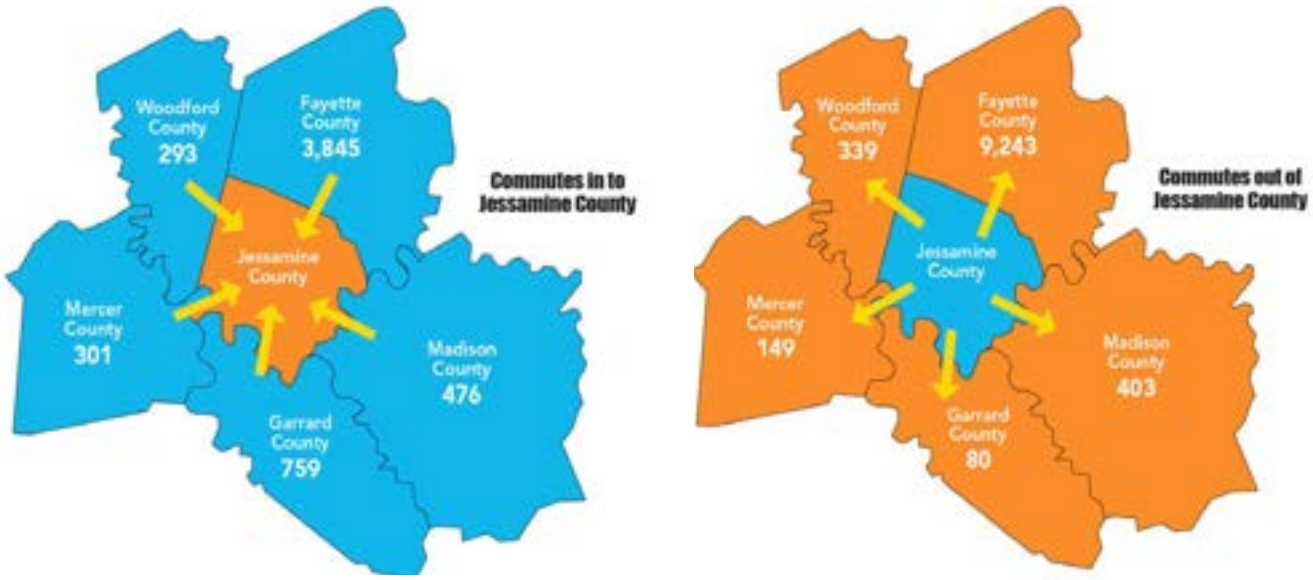



Exhibit 2.6 – Commutes in to & out of Jessamine County
Source: MPO Travel Demand Model

## 2.2.2 Commuting Modes

According to the US Census, seventy-nine percent of Lexington area residents report driving alone as their primary means of commuting to work. Comparatively, the national average for workers driving alone is 76% (2016 ACS). Over the last 16 years (2000-2016) this rate has remained relatively stable in the MPO area.


Exhibit 2.7 – Percent of Workers Driving Alone to Work in the MPO Area
Source: 2000 & 2010 US Census & 2016 American Community Survey (5 yr. Estimate)

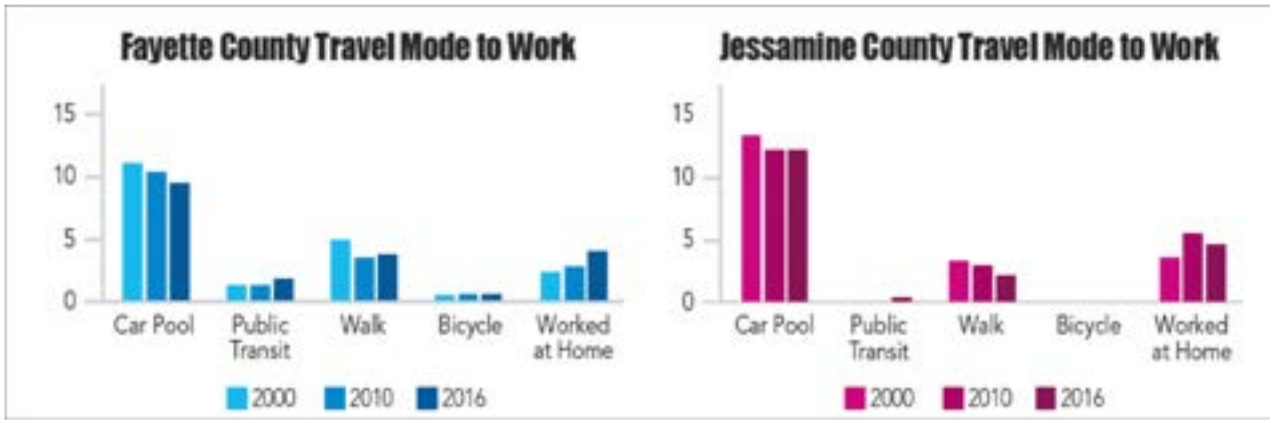



Exhibit 2.8 – Travel Mode to Work Other than Driving Alone (% Mode Share)
Source: 2000 & 2010 US Census & 2016 American Community Survey (5 yr. Estimate)

The remaining ±20 percent of commuters in Fayette and Jessamine County report carpooling, walking, bicycling and using public transportation. While carpoolers make up the largest percentage of workers not driving alone, there has been a consistent drop in carpooling from 2000 to 2016. Working from home, transit use and bicycling to work are on the rise in Fayette County and a two decade drop in walking to work has reversed in recent years. Jessamine County has experienced a less substantial decline in carpooling, but the number of people walking to work and working from home has declined in recent years. Using public transit for work in Jessamine County was newly reported through the ACS as the Bluegrass Community Action Partnership began an intercity NichTran bus route and the intercity Jess Lex Route between Fayette and Jessamine County.

| Travel Mode to Work | 2000 | 2010 | 2016 | % Change (2000-2016) |
|---|---|---|---|---|
| Walk to Work | | | | |
| Fayette | 5.0% | 3.7% | 3.9% | -22% |
| Jessamine | 3.5% | 3.2% | 2.3% | -34% |
| Bike to Work | | | | |
| Fayette | 0.6% | 0.7% | 0.7% | +23% |
| Jessamine | 0.09% | 0.0% | 0.1% | +11% |
| Transit to Work | | | | |
| Fayette | 1.3% | 1.4% | 1.9% | +46% |
| Jessamine | 0.2% | 0.0% | 0.3% | +50% |
| Carpool to Work | | | | |
| Fayette | 11.2% | 10.5% | 9.5% | -15% |
| Jessamine | 13.4% | 12.2% | 12.2% | -44% |

Exhibit 2.9 – Travel Mode to Work Other than Driving Alone (% Change)
Source: 2000 & 2010 US Census & 2016 American Community Survey (5 yr. Estimate)

While the primary travel mode reported by commuters is an important planning consideration - particularly for anticipating peak hour travel demand and congestion - the data collected by the US Census is not the best indicator of overall alternative mode usage. First, it does not capture semi-regular or occasional commuting trips taken by other modes. Second, it only reports travel mode for commuting to work, not other utilitarian or recreational trips, which outnumber commuting trips four to one.

The 2017 National Household Travel Survey reports travel modes for non-commuting trips. Data for the Lexington area is not available; however, the national average for daily trips taken by other modes is 11.5% by walking and biking, 82.3% by driving, 1.5% by public transit and 4.7% by other modes.

### 2.2.3 Travel Times

The average travel time to work has remained relatively stable over the last 20-30 years, particularly in the last decade. Travel time increased slightly in Fayette County from 2000 to 2016 from 19.3 minutes to 20.6 and increased slightly in Jessamine County from 24.1 minutes to 25.1. The Lexington Area MPO average commute time compares favorably to other metro areas where the national average travel time to work is 26 minutes.

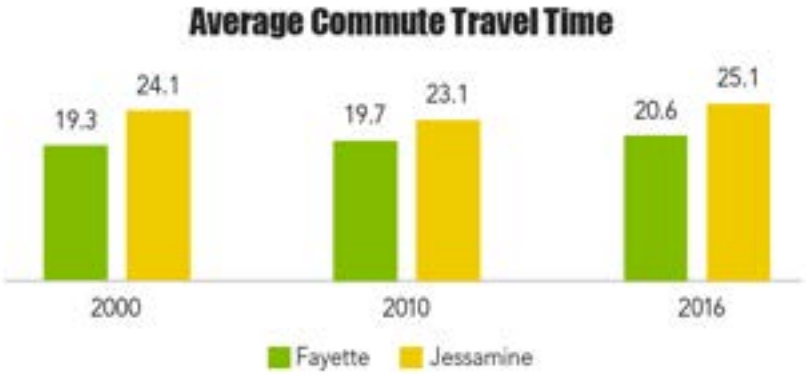



Exhibit 2.10 – Average Commute Travel Time in the MPO Area
Source: 2000 & 2010 US Census & 2016 American Community Survey (5 yr. Estimate)

### 2.2.4 Vehicle Miles of Travel

Vehicle miles of travel (VMT) in the Lexington area has generally held steady over the last 15 year period. VMT represents not just personal travel, but also travel induced by and incurred in the delivery of goods and services in a region. Fluctuations in VMT often follow economic trends. VMT has generally remained level within the Region over the past two decades, even dropping from 2007 through 2013 during a period of economic recession.

However, VMT has since increased, particularly in Fayette County. Fayette County has historically experienced 7.5 to 8.0 million miles of travel per day (approximately 26 miles of vehicular travel per person, per day). Beginning in 2013, VMT in Fayette County began increasing, cresting 8 million trips per day in 2015 and continuing this upward trend in 2016. Jessamine County has had an average of 1 million miles of travel per day (approximately 21 miles of vehicular travel per person, per day) over the last decade with a slight increase in 2012, 2013 and 2014 and a recent decline in 2015 and 2016. If similar trends in VMT continue, 26 miles of vehicular travel per person would equate to 13 million miles of travel in a region of 500,000 people in 2045 (a 30% increase in VMT).

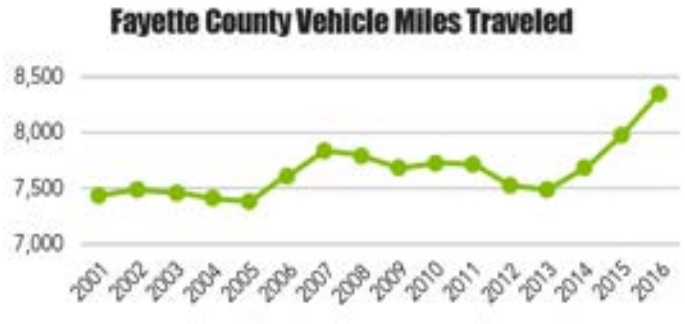



Exhibit 2.11 – Vehicle Miles Traveled in Fayette County
Source: Highway Performance Monitoring System, KYTC

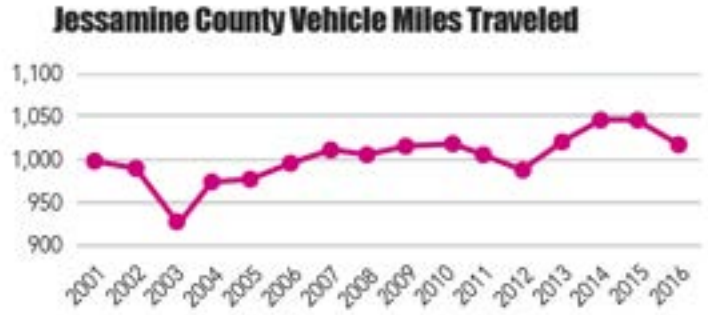



Exhibit 2.12 – Vehicle Miles of Travel in Jessamine County
Source: Highway Performance Monitoring System), KYTC

## 2.3 Transportation System

Transportation systems exist to provide social and economic connections, giving people access to jobs, education, good and services, friends and family. Likewise, transportation systems provide a foundation for economic growth, by facilitating the movement of goods and services throughout a community, a region, the nation and around the world. Comprehensive transportation systems must serve all modes of travel, allowing people and goods to be conveyed on foot and by bike, bus, car, plane or train. A summary of these transportation system elements in the Lexington Area follows.

### 2.3.1 Roadway Network

There are just over 1,800 miles of roadways in the MPO Region. The road network consists of arterials, collectors and local roads in the urban and rural area as well as Interstates I-64 and I-75 in Fayette County. In Fayette County, the arterials include five US highways and seven KY State highways, converging and diverging radially from the center of Lexington. The five main north-south corridors are US-25, US-27, US-68, KY-922 and KY-1974. The three main east-west corridors are US-60, US-421, and KY-1927. New Circle Road, KY-4, loops around Lexington within the Urban Service Area. Man O War Boulevard makes a half-loop in the south area of Lexington-Fayette County.

In Jessamine County, the two main north-south highways are US-27 and US-68. US-27 is designated as part of the National Highway System and carries the largest volumes of traffic in the county. The US 27 Bypass circles around the west side of Nicholasville, while Business US-27(X) passes through downtown Nicholasville. US-27 continues south and crosses Kentucky River at the Jessamine-Garrard County Line. US-68 continues southwest and crosses the Kentucky River at the Jessamine-Mercer County Line. Major east-west connecting routes in Jessamine County include KY 169, KY 29 and KY 39.

**Roadway Mileage**

In the MPO region, approximately 74% of the total road mileage is located in Fayette County and 26% is located in Jessamine County. In contrast, 86% of the region's population is in Fayette County and 14% is in Jessamine County. Both counties have approximately 300 miles of rural roadways. Fayette County has over 1,000 miles of urban roads, whereas Jessamine County has only 183 miles. Local streets and roads comprise about 54% of the total road system, with 46% of roadways being classified as collectors and arterials. Only roadways classified as a collector or arterial are addressed in the MTP.

| Roadway Mileage | Fayette County | | Jessamine County | |
|---|---|---|---|---|
| Classification | Miles | % of Total | Miles | % of Total |
| Rural | | | | |
| Interstate | 79 | 5.9% | 0 | 0.0% |
| Freeway & Expressway | 0 | 0.0% | 0 | 0.0% |
| Principal Arterial | 16 | 1.2% | 11 | 2.3% |
| Minor Arterial | 8 | 0.6% | 21 | 4.4% |
| Major Collector | 77 | 5.7% | 18 | 3.8% |
| Minor Collector | 29 | 2.1% | 54 | 11.3% |
| Local | 100 | 7.4% | 190 | 39.8% |
| Subtotal = 603 | 309 | 22.9% | 294 | 61.6% |
| | | | | |
| Urban | | | | |
| Interstate | 38 | 2.8% | 0 | 0.0% |
| Freeway & Expressway | 39 | 2.9% | 0 | 0.0% |
| Principal Arterial | 125 | 9.3% | 16 | 3.4% |
| Minor Arterial | 91 | 6.7% | 13 | 2.7% |
| Major Collector | 121 | 9.0% | 11 | 2.3% |
| Minor Collector | 77 | 5.7% | 1 | 0.2% |
| Local | 550 | 40.7% | 142 | 29.8% |
| Subtotal = 1,224 | 1,041 | 77.1% | 183 | 38.4% |
| | | | | |
| MPO Total = 1,827 Miles | 1,350 | 73.9% | 477 | 26.1% |

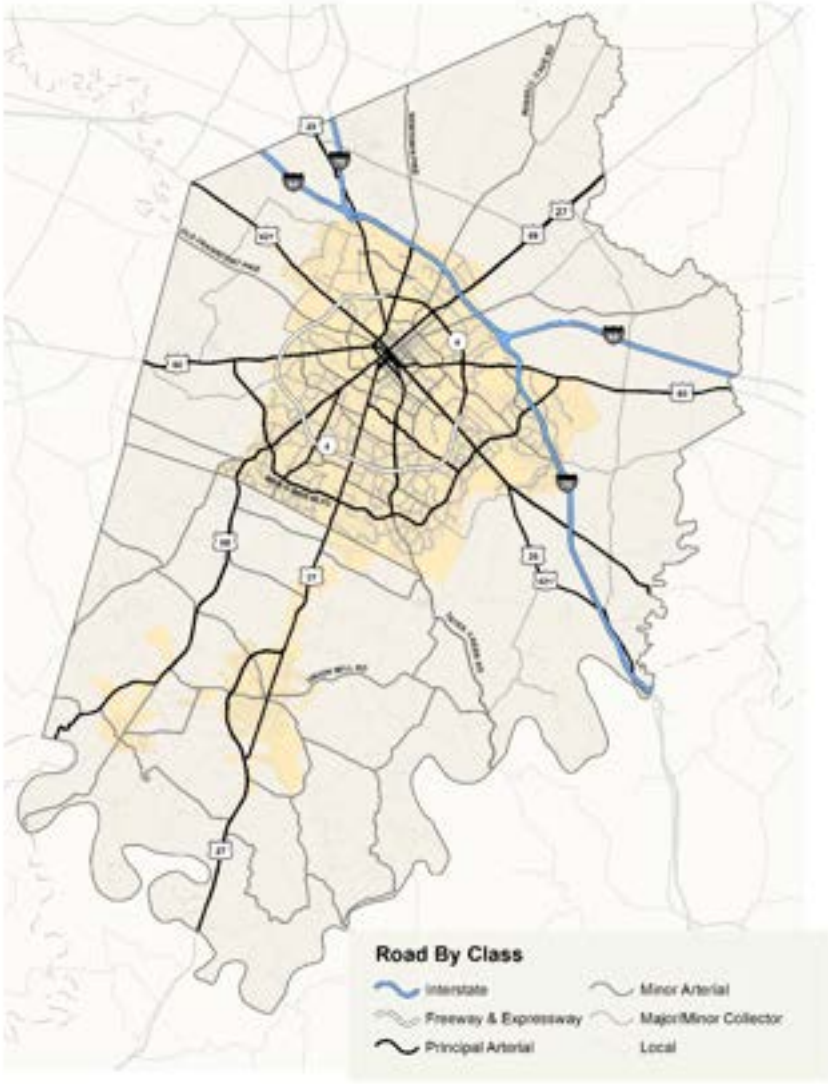



Exhibit 2.13 – Road Network Mileage within the MPO Area
Source: Kentucky Transportation Cabinet

## Roadway & Bridge Condition

Keeping roadways and bridges in a state of good repair is important to the public and a primary goal of transportation agencies. Poor pavement and bridge quality can degrade user experience, reduce safety, increase fuel consumption and operating costs, and cause damage to vehicles. Roadway and bridge condition is evaluated and tracked by both the KY Transportation Cabinet and local governments. Major roadways are evaluated by the KYTC, whereas local streets are evaluated and repaired by cities and counties within the MPO.

## National Performance Measures for Infrastructure Condition

FHWA established performance measures for State DOTs to use in managing pavements and bridges on the National Highway System (NHS). The National Performance Management Measures: Assessing Pavement and Bridge Condition for the National Highway Performance Program Final Rule addresses federal requirements established under MAP-21 and continued with the FAST Act. This includes the requirement that State DOT set performance targets for pavements and bridges on interstates and non-interstate roadways that are part of the NHS (see Exhibit 2.15 below).

KYTC established their required targets by May 20, 2018. The Lexington Area MPO elected to accept and support the KYTC-adopted performance targets in October 24, 2018. This means the Lexington Area has agreed to plan and program projects so that they contribute toward the accomplishment of the state's infrastructure performance measure targets. KYTC uses the Highway Performance Monitoring System to evaluate and categorize the roads as either good, fair or poor. In the Lexington Area, 73% of interstate pavement is in good condition and 27% is in fair condition. Two percent of non-interstate roadways on the National Highway System are in poor condition. A good condition suggests no major improvement is needed and poor condition suggests major reconstruction investment is needed.

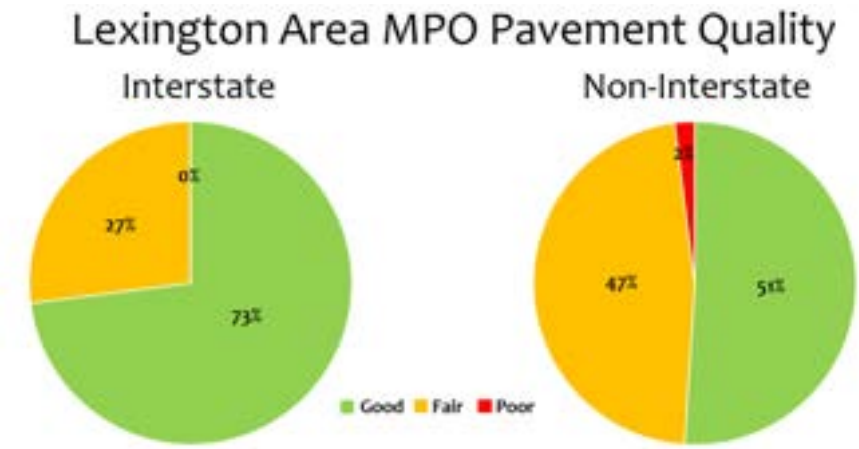



Exhibit 2.15 – Lexington Area Pavement Quality for National Highway System Roadways
Source: Highway Performance Monitoring System (HPMS), Kentucky Transportation Cabinet (2016)

| | KYTC Target (2018) | | Lexington Area MPO Baseline (2018) |
|---|---|---|---|
| | 2 Year | 4 Year | |
| **Pavement Performance** | | | |
| % of Interstate in Good Condition | 50% | 50% | 73% |
| % of Interstate in Poor Condition | 3.0% | 3.0% | 0.1% |
| % of Non-Interstate in Good Condition | 35.0% | 35.0% | 51% |
| % of Non-Interstate in Poor Condition | 6.0% | 6.0% | 1.9% |
| **NHS Bridge Performance** | | | |
| % of NHS Bridges in Good Condition | 35.0% | 35.0% | 24.0% |
| % of NHS Bridges in Poor Condition | 3.7% | 3.2% | 1.0% |

Exhibit 2.16 – Performance Measures/Targets for Infrastructure Condition for National Highway System Roadways
Source: Kentucky Transportation Cabinet

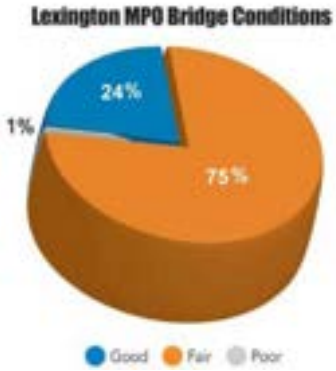



Exhibit 2.17 – Lexington Bridge Conditions
Source: Highway Performance Monitoring System (HPMS), KYTC (2016)

For bridges not on the National Highway System, Kentucky has 1,104 that are structurally deficient. This represents 7.8 percent of non-NHS bridges statewide. A deficient rating does not necessarily mean a bridge is unsafe, rather that there are components that are in need of monitoring and/or replacement.

As shown in Exhibit 2.18, Fayette County has a total of 198 non-NHS bridges of which 8 (4%) are "structurally deficient" structures. Eight bridges are rated in poor condition (4%) and 133 are in fair condition (67.2%). Jessamine County has a total of 56 non-NHS bridges of which 3 (5.4%) are "structurally deficient" structures. Two bridges are in poor condition (3.6%) and thirty-one (55.4%) bridges in Jessamine County are in fair condition. Bridge conditions for the entire MPO are 22% good,

**Structually Deficient:**
A classification given to a bridge which has any component in poor or worse condition or the adequacy of the waterway opening provided by the bridge is determined to be insufficient to the point of causing overtopping with intolerable traffic interruptions.

**National performance management measures for assessing bridge condition.**
There are three classifications for the purpose of assessing bridge condition: Good, Fair, and Poor.

MPO Area Bridge Condition

| Category | Fayette | Jessamine |
|---|---|---|
| Total Number of Bridges | 198 | 56 |
| Good Bridges | 57 | 23 |
| Fair Bridges | 133 | 31 |
| Poor Bridges | 8 | 2 |
| Structurally-Deficient Bridges | 8 | 3 |

Source: FHWA Bridge Programs National Bridge Inventory (NBI) data for National Highway System (NHS) Bridges dated 12/31/2017

Exhibit 2.18 – Lexington Area Condition Ratings for Bridges not on the National Highway System
Source: FHWA Bridge Programs National Bridge Inventory (NBI) (12/31/2017) & National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program (12/31/2017)

## Roadway Congestion

Roadway congestion is characterized by slower vehicular speeds, longer trip times and increased vehicular queueing. Severe congestion results in the loss of economic productivity (wasted time and slowed movement of goods and services) and environmental consequences including increased fuel consumption and vehicle emissions.

According to the FHWA's *Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation* report, there are seven root causes of recurring and non-recurring congestion.

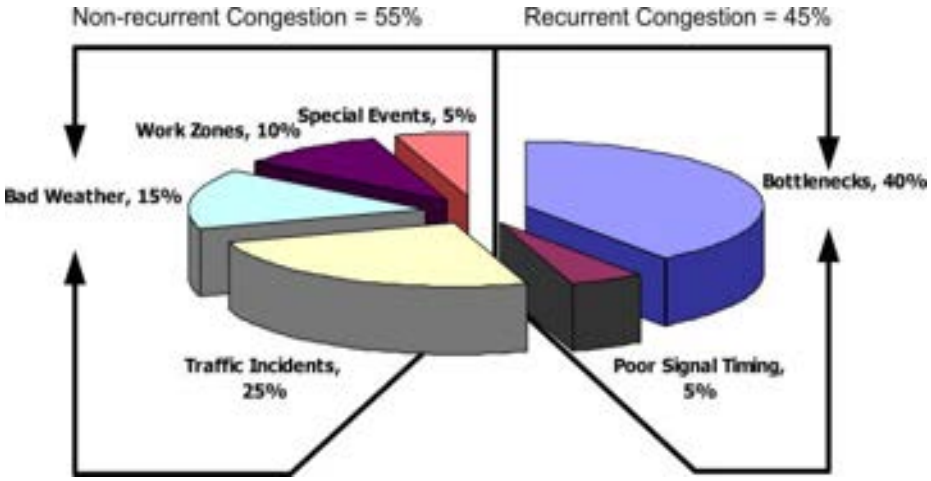



*Exhibit 2.19 - Causes of congestion in the United States*
*Source: Federal Highway Administration, Office of International Programs*

Recurring congestion occurs when too many people routinely attempt to drive on a roadway at the same time, typically during commute hours. Forty-five percent of congestion is recurring. Non-recurring congestion (55% of all congestion) happens when there are irregular disruptions to the flow of traffic including traffic incidents (25% percent), bad weather (15%), work zones (10%) and special events (5%).

Congestion management is a process that monitors transportation facilities and seeks to mitigate congestion through planning, operations, system management and projects that will effectively address bottlenecks and corridor-based congestion problems. The current transportation regulation, FAST ACT retains the requirement for MPOs to have a Congestion Management Process (CMP) in place for monitoring and reporting congestion, system performance and reliability. The Lexington Area MPO's CMP framework utilizes data, reports and studies to document congestion conditions through performance measures and identifies strategies to improve the system. Projects and programs identified in the MPO's MTP and TIP reflect this process by considering and weighting CMP performance measures and CMP solutions in the project selection and ranking process (see Appendix D). CMP-related studies and documents are available at www.lexareampo.org

The MPO formed a Congestion Management Committee (CMC) to oversee the CMP and to provide technical assistance to the MPO & TPC on congestion related issues. The mission of the CMC is to coordinate congestion management activities to help alleviate transportation congestion recurring in the MPO planning area. The CMC members include transportation professionals from federal, state, and local governments and agencies as well as interested citizens and private consulting companies. All professional staff and citizens who are interested in transportation planning and congestion management activities are welcome to attend CMC meetings and present their questions, suggestions, and ideas.

## National Measures for System Performance

Per the FHWA Transportation Performance Management (TPM) framework established by the MAP-21 and FAST Act, the FHWA established six performance measures to assess system performance, three of which the Lexington Area MPO are required to monitor:

- Percent of reliable person-miles traveled on the Interstate system
- Percent of reliable person-miles traveled on the non-Interstate NHS
- Interstate truck travel time reliability index

The federal rule requires that the Level of Travel Time Reliability (LOTTR) be used to assess the performance of the roadway system. Travel Time Reliability measures the consistency of travel time for the same trip measured day-to-day or across different times of the day. If trip times are inconsistent the travel time is considered unreliable. This means that travelers must plan for these problems by leaving earlier to avoid being late, leading to time wasted.

LOTTR is defined as the ratio of the longer travel times (80$^{th}$ percentile) to a "normal" travel time (50$^{th}$ percentile), using data from FHWA's National Performance Management Research Data Set (NPMRDS) or equivalent. A roadway segment would meet travel time expectations when the calculated value of the travel time reliability is less than 1.50.

KYTC established their required system performance targets by May 20, 2018. The Lexington Area MPO elected to accept and support the KYTC-adopted performance targets on October 24, 2018. This means the MPO has agreed to plan and program projects so that they contribute toward the accomplishment of the KYTC's system performance measure targets.

| | KYTC Target (2018) | | Lexington Area MPO Baseline (2018) |
|---|---|---|---|
| | 2 Year | 4 Year | |
| **System Reliability** | | | |
| % of Reliable Interstate Miles Traveled | 93% | 93% | 100% |
| % of Reliable Non-Interstate Miles Traveled | | 82.5% | 75.1% |
| Interstate Truck Travel Time Reliability Index | 1.24 | 1.25 | 1.13 |

*Exhibit 2.20 – National Measures for System Performance Source: Kentucky Transportation Cabinet*

The travel time reliability for interstates and roadways on the NHS in the Lexington Area are shown in the exhibits below as well as the truck travel time reliability for the Lexington Area and statewide.



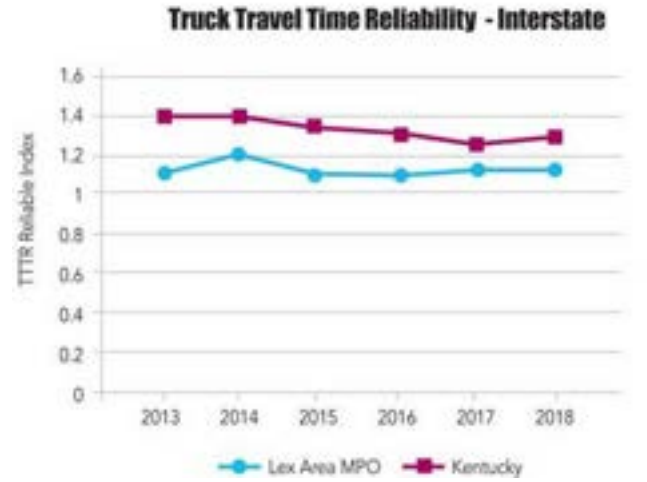
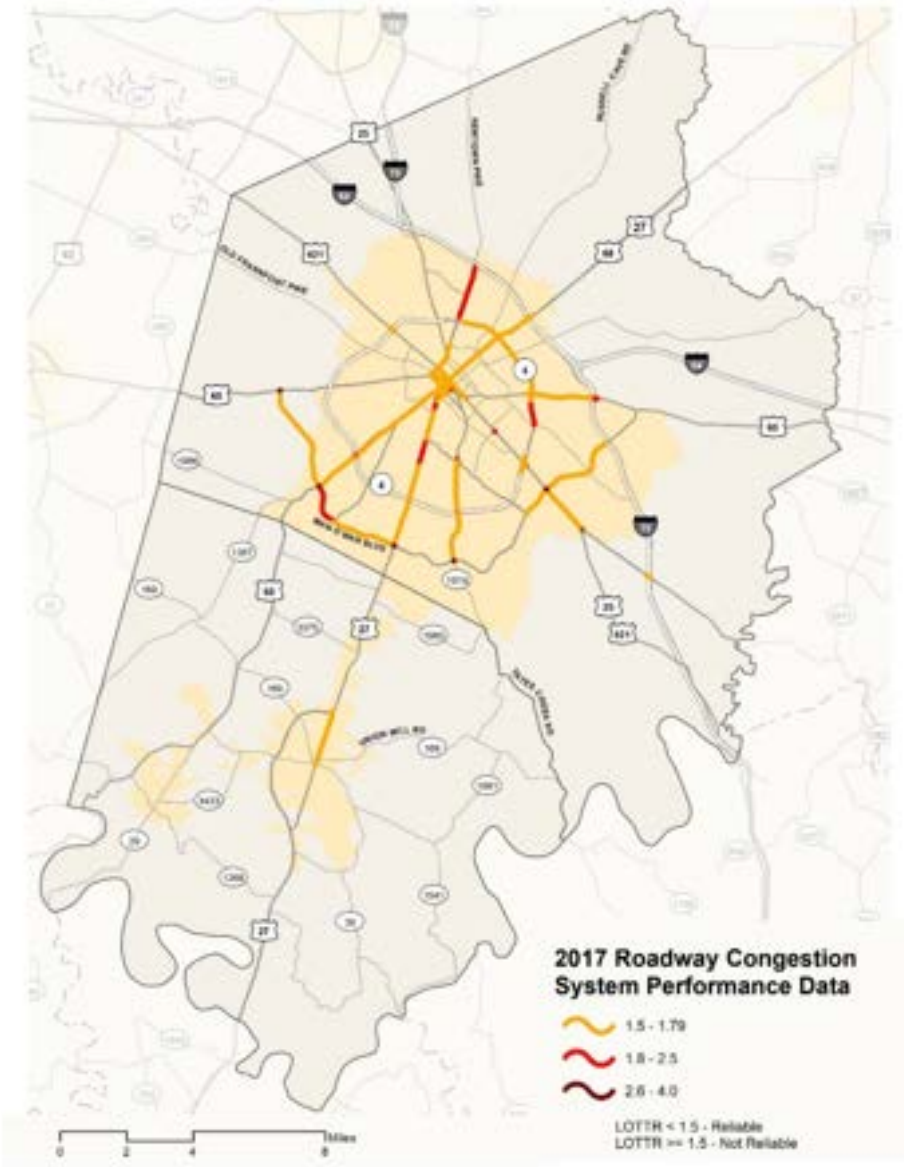



***Exhibit 2.21 –Travel Time Reliability***
***Source: National Performance Management Research Data Set (NPMRDS)***



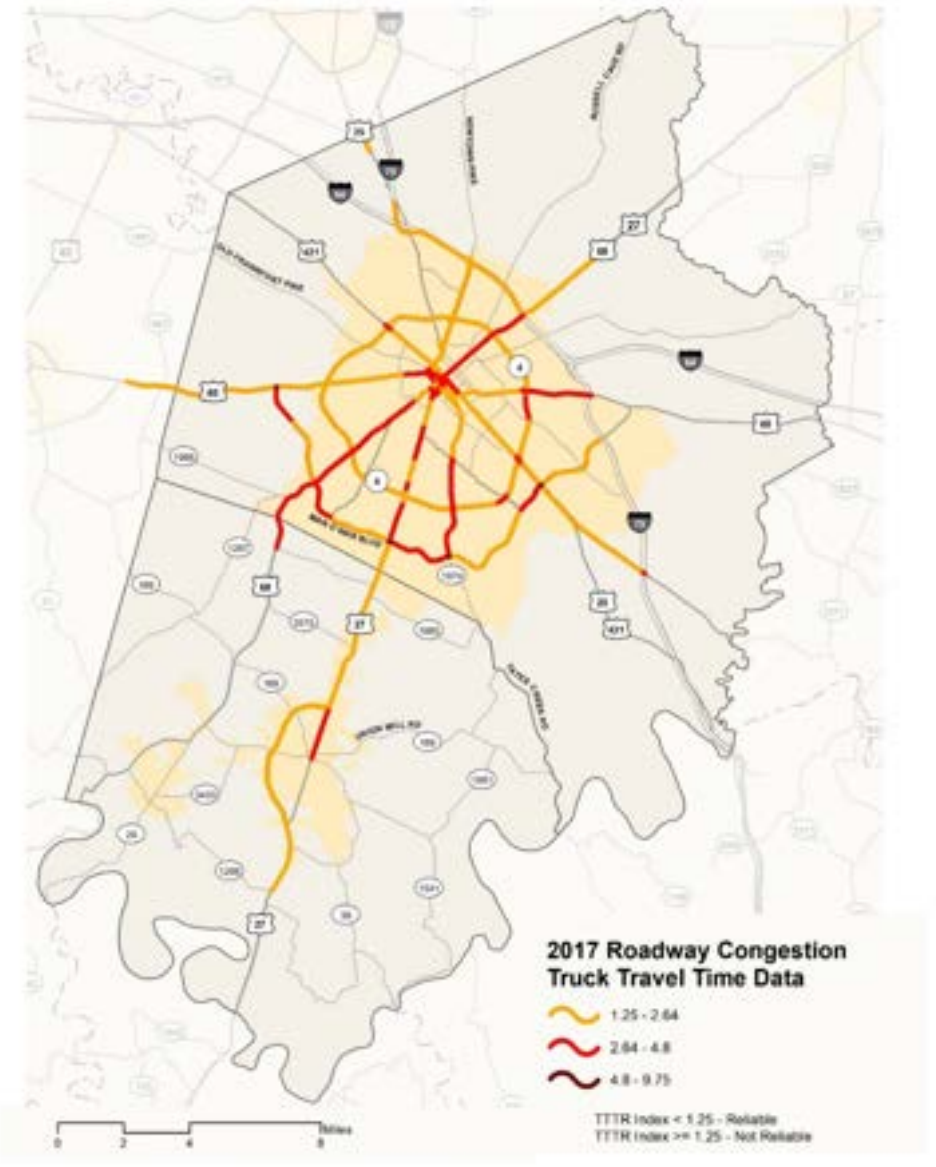




*Exhibit 2.22 – Level of Travel Time Reliability (Interstate & NHS) & Truck Travel Time Reliability*
*Source: National Performance Management Research Data Set (NPMRDS)*

### *Volume to Capacity Ratio*

The "Volume to Capacity" ratio is another common measure used for transportation planning and congestion management. Traffic volume is defined as the number of vehicles that pass a point on a transportation facility during a specified time period, which is usually expressed in vehicles per hour or per day. Road or lane capacity, which is also expressed in vehicles per hour or per day, is the maximum traffic volume obtainable on a given road or lane. Volume to Capacity (V/C) ratio is a measure that reflects mobility and quality of travel on a facility or a section of a facility. It compares roadway demand (vehicle volume) with roadway supply (carrying capacity). For example, a V/C of 1.00 indicates the roadway is operating at its capacity, a V/C above 1.0 indicates a facility is operating above capacity for the desired level of service. A roadway's V/C is typically reported for peak travel periods, and this analysis reports on the morning commute.

Exhibit 2.23 below shows which major roads in the Lexington MPO Area have reached or are approaching significant congestion levels based upon our existing road network. "Significant congestion" was defined as a V/C at or above 1.5 during peak periods. Roadways with a V/C greater than 1.0 but less than 1.5 are were denoted as "approaching significant congestion" levels.

Whereas the first map shows conditions today, the second map (Exhibit 2.24) shows congestion conditions in the year 2045 given our existing road network and the completion of all the committed short-range projects that are currently underway, but without any of the long-range projects planned within the 2045 MTP (referred to at the 2045 "no build" scenario). See Chapter 4 for a depiction of projected congestion levels on major roads once the MTP 2045 projects are implemented.

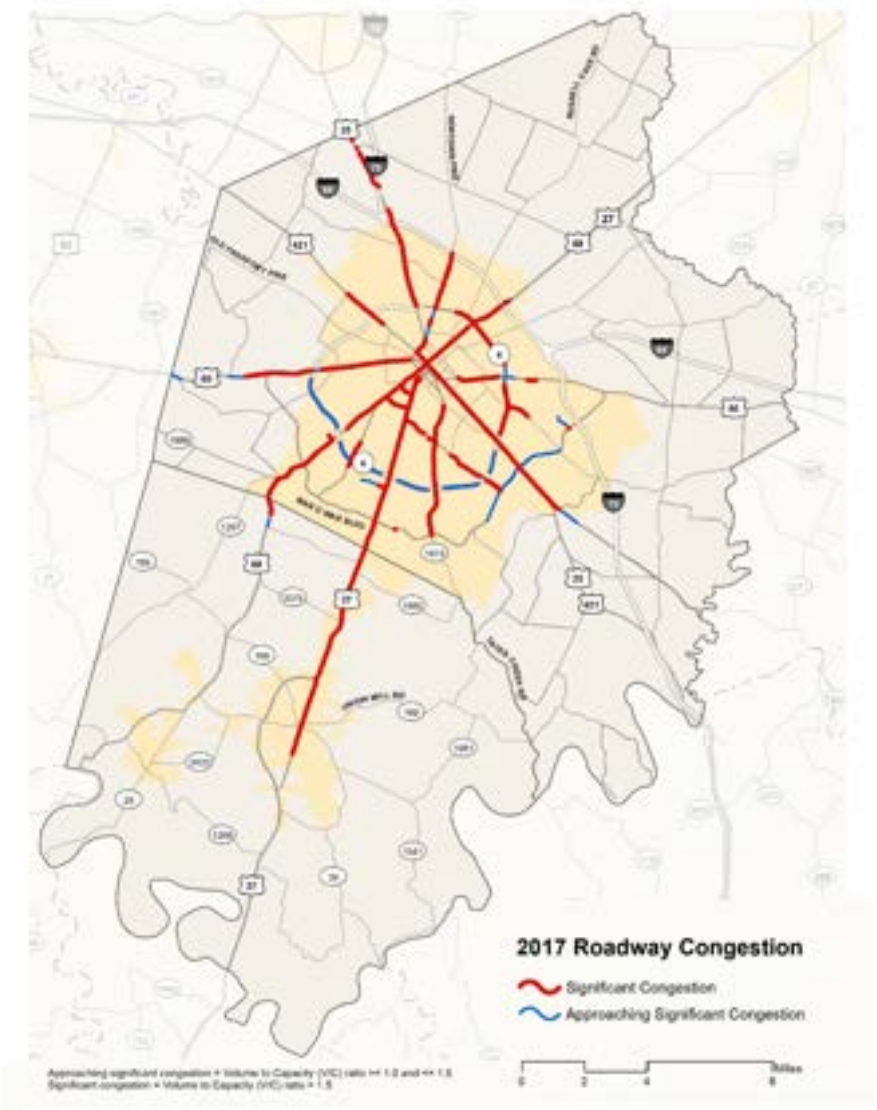



Exhibit 2.23 – Worst Congested Roadways for Base Year 2017
Source: Lexington Area MPO Travel Demand Forecasting Model

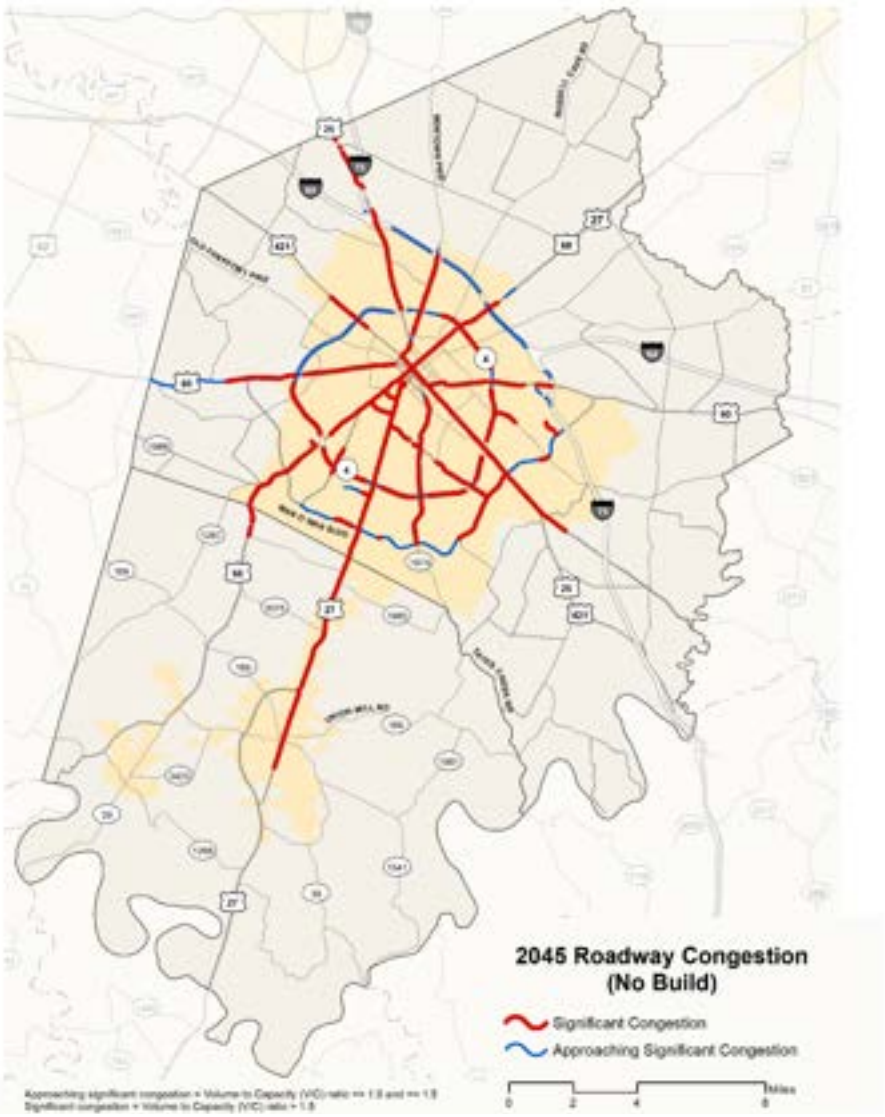



Exhibit 2.24 – Worst Congested Roadways in 2045 ("No Build")
Source: Lexington Area MPO Travel Demand Forecasting Model

### 2.3.2 Freight Network

Goods movement within and across a region is vital to local communities, economies and industries that rely significantly on freight including manufacturers, distributors, retailers and agriculture. Public and private sectors play a role in freight movement and coordination is necessary at the regional, statewide and national level across many freight modes including rail, air, water and highways.

The FHWA has identified freight movements as one of the fastest growing and rapidly changing transportation issues. In response, an MPO Freight Plan was drafted in 2007 to provide insight on needs and issues within the region and to help guide planning and investment to ensure that freight movement is maintained and maximized. The plan reviews freight trends across various transport modes and recommends strategies to address:

- Coordination with freight providers
- Land use issues
- Roadway design & access management
- Designated truck routes
- Freight modeling
- Monitoring, commodity surveys & freight studies

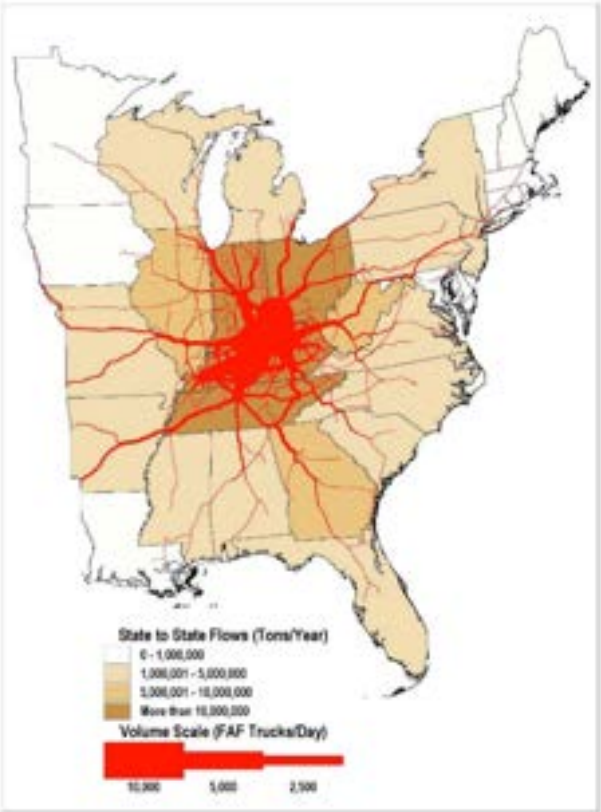



Exhibit 2.25 – Major Truck Flows: To, From & Within KY
Source: 2017 Kentucky Freight Plan, KYTC

The KYTC adopted the 2017 Kentucky Freight Plan, which was designed to be compliant with the FAST Act, placing a major emphasis on freight investment across the state of Kentucky. The MPO regularly collaborates with and supports the KYTC in meeting the vision and goals of that plan.

#### Trucking

In Kentucky, and especially in the Lexington Area, the vast majority of freight shipments are handled by truck. The Lexington Area is a strategic asset for the movement of truck freight for Kentucky, and the nation due to its central location and the crossroads of the north/south Interstate 75 and the east/west Interstate 64 as seen in Exhibit 2.25 from the 2017 Kentucky Freight Plan.

In the MPO Area, through trucks primarily utilize I-75/64 with the truck traffic percentage reaching 15-25% along portions of those interstates. Trucks also frequently utilize New Circle Road and US 60 when traveling to and from the Bluegrass Parkway. Many industries with major trucking terminals are located on the north side of Lexington near the interstates. In Jessamine County, McClane Trucking is a major shipping industry located on US 27, just north of the Nicholasville By-pass. Other shippers & receivers are primarily concentrated along major arterials in professional service and commercial zones.

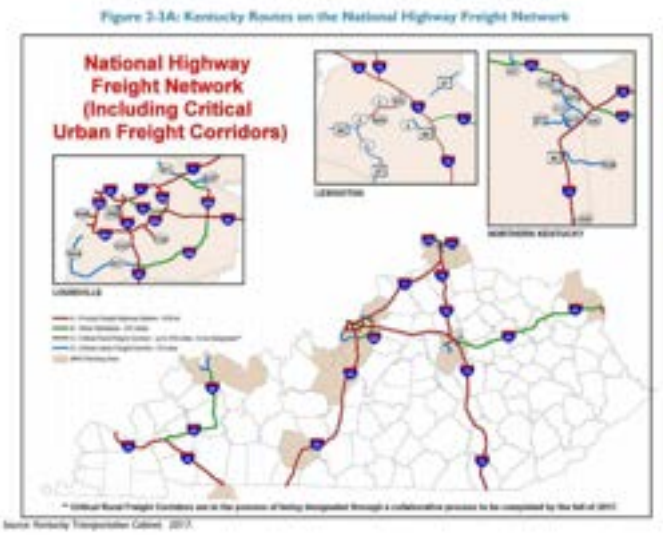



Exhibit 2.26 – National Highway Freight Network in KY
Source: 2017 Kentucky Freight Plan, KY Transportation Cabinet

The FHWA designated a total of 776 miles of Kentucky highways as part of the National Freight Network. Seventy-five additional miles are designated as Critical Urban Freight Corridors (CUFC) and 150 additional miles are designated as Critical Rural Freight Corridors (CRFC). KYTC worked closely with the MPOs in Kentucky to identify the CUFCs. Louisville, OKI, Henderson and the Lexington Area MPO cooperated to refine a collective agreement on which local routes could be identified as CUFCs based on the FHWA-allocated 75 miles of routes allowable for the state. This resulted in Fayette and Jessamine counties designating a total of 18.5 miles of Critical Urban Freight Corridors that will support the national efforts to promote freight and economic vitality in the region.

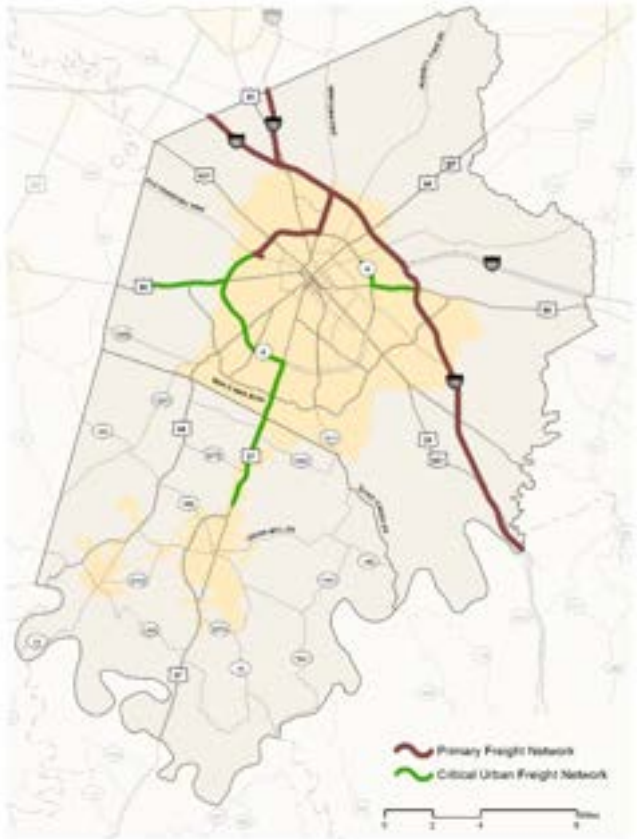



Exhibit 2.27 – Critical Urban Freight Corridors
Source: 2017 Kentucky Freight Plan, KYTC

## Air

The Blue Grass Airport is an intermodal transfer point that provides for the movement of people and freight. Air cargo at the airport is handled by both airlines and independent cargo carriers, and consists of airfreight, air express and the United States mail. Equine air transportation is also available at the Bluegrass Airport

## Rail

Lexington has two Class-I rail freight operators - CSX Transportation and Norfolk Southern Corporation (Norfolk-Southern has lines in both Fayette and Jessamine County) and one Class-III rail operator – RJ Corman Railroad Group. Areas served by these railroads include a major east-west corridor through central Fayette County and a major north-south corridor through central Fayette and Jessamine County, as well as Wilmore. Various area industries have direct rail access for shipping and receiving including lumber companies, manufacturers, trucking companies and agricultural warehouses and stockyards.

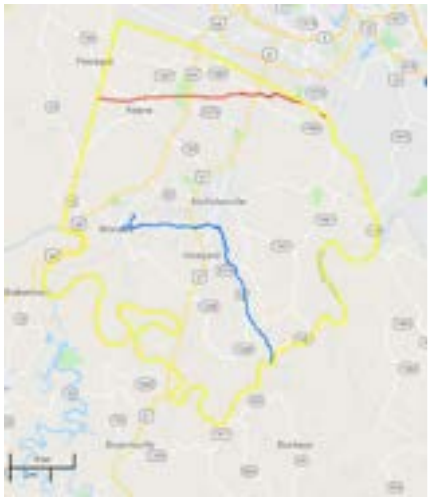

## Water

There are no major navigable waterways in the Lexington Area that serve as freight corridors, nor are there any ports in the Lexington Area.

## Pipeline

The Lexington Area has approximately 70 miles of the National Pipeline System which include gas transmission and hazardous liquid pipelines.

Fayette County Pipeline
--- Gas Transmission Pipelines ≈ 22 miles
--- Hazardous Liquid Pipelines ≈ 16 miles



Jessamine County Pipeline
--- Gas Transmission Pipelines ≈ 20.5 miles
--- Hazardous Liquid Pipelines ≈ 11.5 miles

Exhibit 2.28 – Fayette and Jessamine County Pipeline (maps do not contain distribution or gas gathering pipelines)
Source: Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA)

### 2.3.3 Bicycle & Pedestrian Network

Communities that are walkable and bike-friendly have been shown to have stronger local economies, safer streets and citizens that are more active both socially and physically. To that end, the MPO continues to emphasize bicycle and pedestrian planning and the implementation of projects and programs to improve livability and provide sustainable transportation options. Bicycle and pedestrian planning and design has been a fast evolving practice over the last decade. Separated bike facilities and bike sharing programs have transformed the way cities and citizens think about bike commuting. Place-making best practices continue to stress the importance of human-scale, livable streets that are designed for people of all ages and abilities. Transit access is more important than ever as communities are improving transit options to better serve aging boomers and millennials who desire more transportation options. To respond to these changes, the MPO updated its Regional Bicycle and Pedestrian Master Plan (BPMP) in 2017, which was adopted by the TPC in 2018.

#### Bicycle Facilities

Bicycling in the MPO area is gaining in popularity as a means to get to work, to school and to get more exercise. People who ride bikes vary in age, skill and trip purpose. Likewise, there are different methods and facilities to accommodate cycling. The bicycle system can be considered in terms of Rural (outside of the urban service or planned growth area) and Urban (inside the urban service or planned growth area). In general, the primary purpose people ride bikes in the two areas differs. Recreational cycling is common on rural secondary roads where motorists and cyclists must share the lane. Recreational cyclists are generally more experienced distance riders who are comfortable on rural secondary roads (local and collector roads) with low traffic volumes and along primary rural roads (arterial roads) that have paved shoulders. "Share the road" signs have been placed along common routes that people bicycle on in rural areas of the Lexington Area MPO to warn motorists that cyclists may be present on the roadway.

In the urban areas, commuting to work or school as well as to access goods and services (utilitarian trips) are the primary trip purposes. The urban bicycle network can be divided into two categories separated bicycle facilities and on-road bicycle facilities.

**Separated bicycle facilities** include shared use paths, barrier-separated bike lanes and grade-separated bike lanes. They offer a riding experience separated from vehicular traffic, which is often preferred by a wider range of ages and abilities and less experienced cyclists. Separated bicycle facilities are proven to encourage new ridership.

**On-road bicycle facilities** include bike lanes, buffered bike lanes, sharrows, bicycle boulevards and road shoulders of adequate width. These on-road facilities delineate a portion of the roadway with striping, signage, pavement markings and traffic calming measures. Bike lanes, buffered bike lanes

and road shoulders help separate bicycles and motor vehicles, address their speed differential and facilitate predictable behavior and interactions between bicyclists and motorists.

**Shared roadways** are streets without exclusive designation for bicycles (such as local neighborhood streets) and in many cases, these roadways do not need specific treatments to accommodate bicycle traffic safely. Additional signage, markings and traffic calming measures can be placed on shared roadways (including signed bike routes and shared lane markings or "sharrows") to designate a preferred bicycle facility and/or draw attention to the presence of bicyclists.

In the MPO area, the mileage of bike lanes and shared use trails has continued to grow over the last 5 year period, increasing to more than 100 miles, or about 10 miles per year. This includes 50 miles added to the bicycle network by implementing bike lanes as a part or routine repaving, new and reconstructed roads and by continued implementation of shared use trails including the Legacy Trail, Brighton Rail Trail and the Town Branch Trail. This increase in bicycle infrastructure mileage has necessitated a new approach to maintenance.


Exhibit 2.29 – MPO Bicycle Facilities by Year
Source: LFUCG MPO

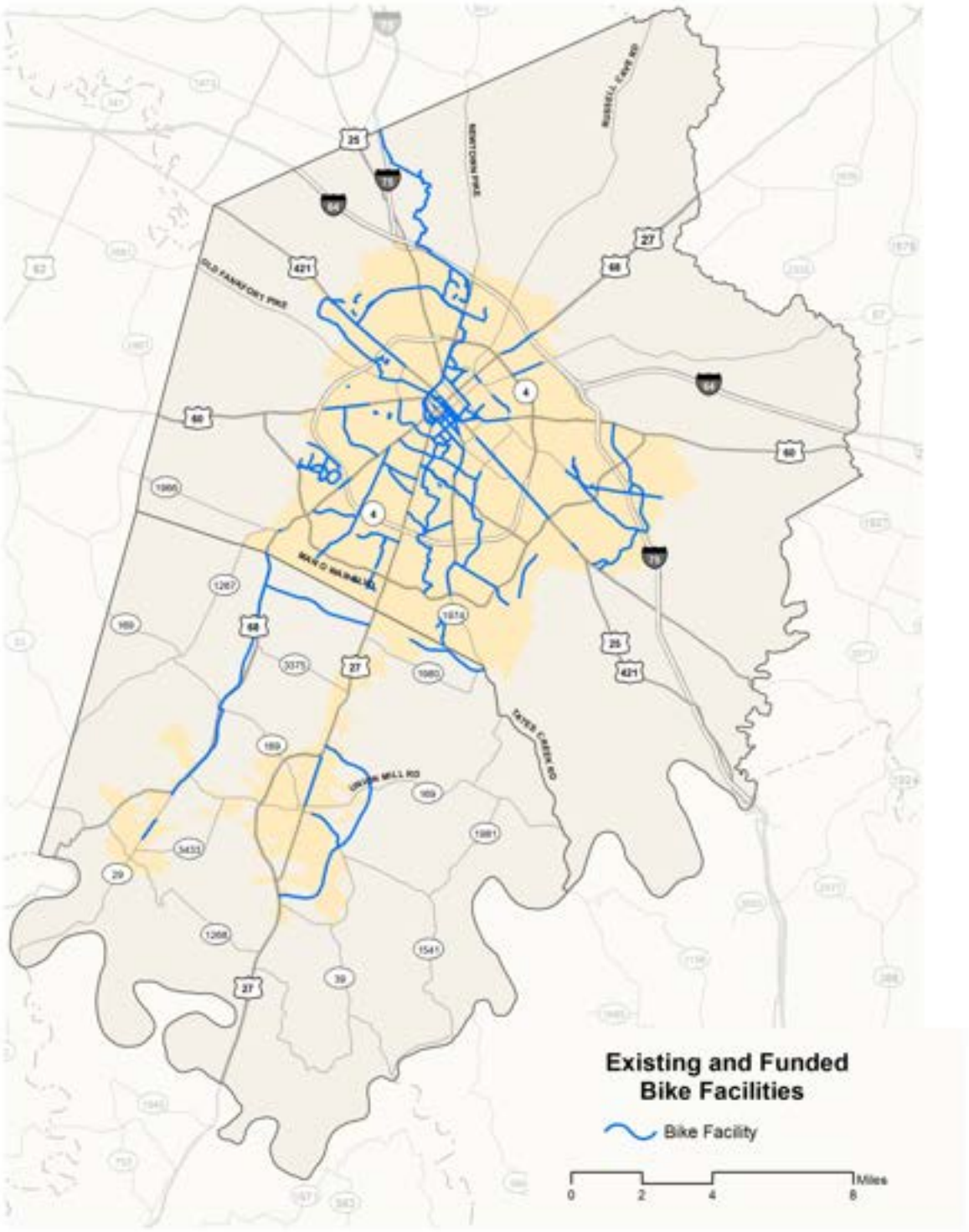



Exhibit 2.30 – Existing & Funded Bicycle Facilities in the Lexington MPO Area
Source: LFUCG MPO

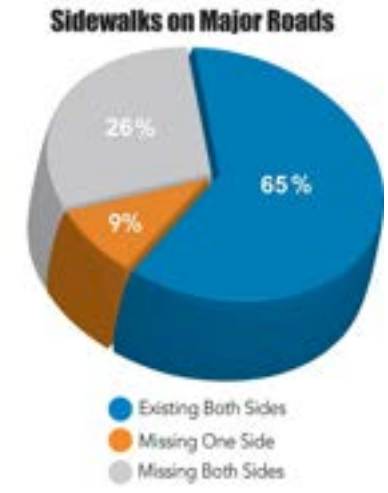
## Pedestrian Facilities

Walkable communities encourage walking for short trips and for physical activity by creating streets that are safe, comfortable and interesting. Pedestrian-oriented streets, building structures and land use patterns make it convenient for residents to walk to services, shopping, schools and jobs. Walkable communities also have good street and sidewalk connectivity to reduce walking distances and to create multiple route choices. Walkable communities have streets with shade trees, sidewalks that are buffered from traffic and buildings entrances and facades that are oriented toward people walking on the street.

At some point each day we are all pedestrians. Streets and destinations within urban areas (and many rural areas) will be accessed by someone on foot at one time or another. For this reason, we must expect and accommodate walking on all urban roadways, with the exception of limited access highways. Studies indicate that fewer pedestrian collisions occur along roadways with sidewalks on both sides of the street compared to streets with no sidewalks or sidewalks on only one side.

The figure below indicates the percentage of major roads in the MPO region that have sidewalks on no sides, one side, or both sides of the street. One third of major arterials lack sidewalks on both sides of the street, which is problematic given high vehicular speeds and traffic volumes. In fact, a majority of pedestrian fatalities occur along arterials where pedestrians must cross wide roads with fast moving vehicles. The MPO has worked to increase sidewalk network mileage through capital projects and requiring sidewalk installations as new development and redevelopment occurs.

Photo Source: ***www.kentucky.com***




Walkability is more than sidewalks. The ability and ease to cross streets and intersections is also important. The MPO has worked to improve pedestrian crossings through the addition of high-visibility marked crosswalks, closer or more frequently placed crossings, ADA compliant signals and curb ramps, lead pedestrian interval signal timing (LPIs), countdown signals and audible signals. While many intersections do provide pedestrian signals, crosswalks and curb ramps, these features do not always imply a walkable environment. Other factors such as high traffic volumes, wide multi-lane roads and intersections and aggressive or distracted driver behavior can diminish walkability.

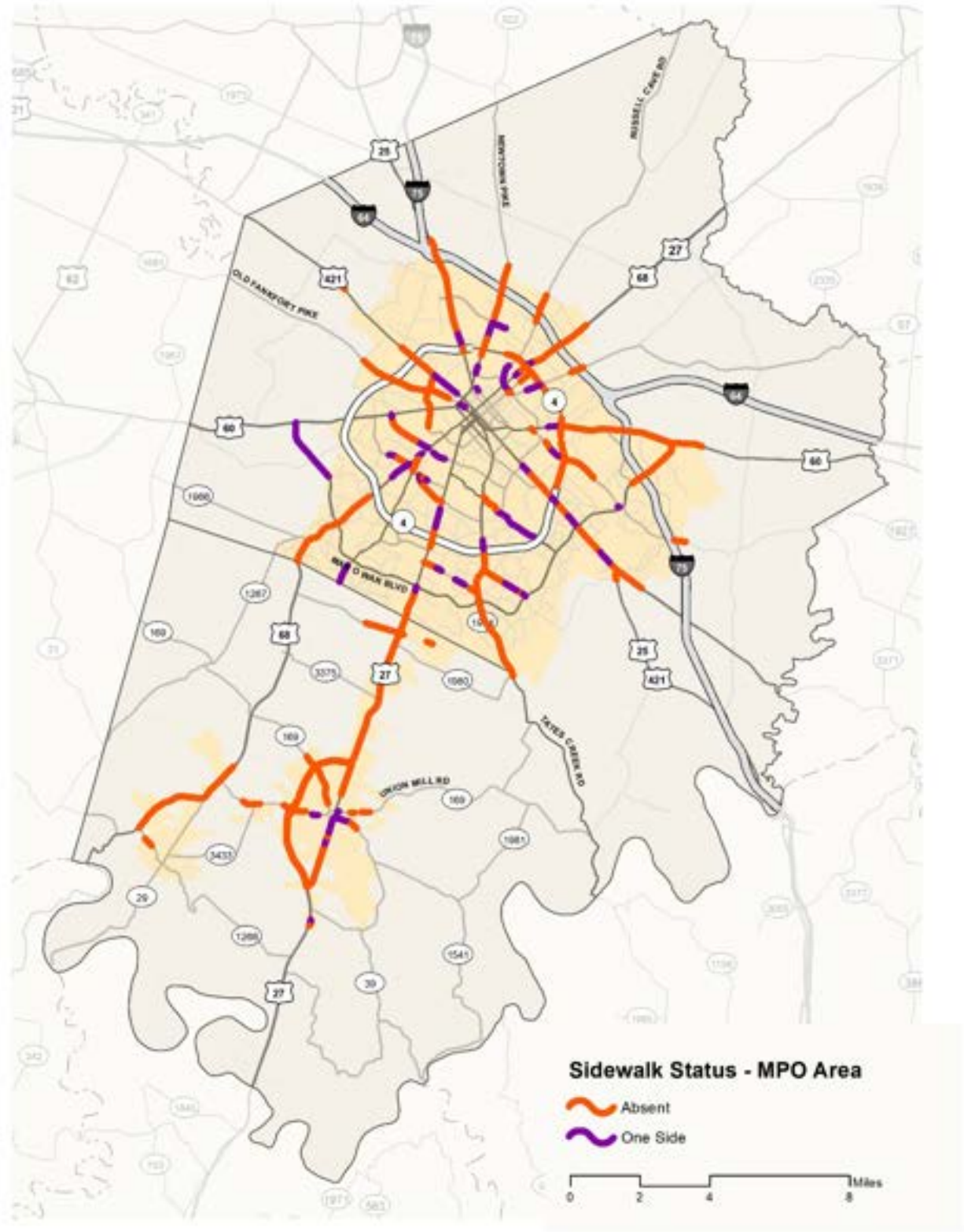



Exhibit 2.32 – Location of Sidewalks on Major Roads in the Lexington MPO Area
Source: LFUCG MPO

The image below is an example of a walkability score developed from GIS-based data including population density, nearby destinations and the walkability of the street system based on block length and intersection density. Overall, the Lexington Area scores a 34 which is within the "car-dependent" range; however, there are neighborhoods scoring high on the walkability scale. Data from the US Census shows that far more people walk to work in many of these area. Continued efforts by the MPO to increase the overall walkability of urban areas include encouraging pedestrian-oriented street, land use and community design.


| Walk Score® | Description |
|---|---|
| 90–100 | **Walker's Paradise** Daily errands do not require a car. |
| 70–89 | **Very Walkable** Most errands can be accomplished on foot. |
| 50–69 | **Somewhat Walkable** Some errands can be accomplished on foot. |
| 25–49 | **Car-Dependent** Most errands require a car. |
| 0–24 | **Car-Dependent** Almost all errands require a car. |

Exhibit 2.33 – Lexington "Walk Score"
Source: (www.walkscore.com)

## Bicycle and Pedestrian 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 1999, the MPO established the Bicycle Pedestrian Advisory Committee (BPAC) to provide guidance on bicycle and pedestrian needs and projects in the MPO region. As a result, bicycle and pedestrian facilities are now routinely included in roadway improvement projects and more funding has been allocated for bike and pedestrian projects. In addition, a Bicycle/Pedestrian Coordinator position was established in 2003 to advocate for, and work to address bicycle and pedestrian issues in the MPO area. The MPO staff and BPAC members work together to encourage more bicycling and walking, increase safety and distribute information through various media and community events. Some more recent achievements include the involvement in and recognized efforts from the FHWA's Mayor's Challenge for Safer People and Safer Streets and Smart Growth America's Safe Streets Academy.

## 2.4 Transportation Services

There are a number of transportation services in the Lexington MPO Area that enhance mobility and access for people who cannot or choose not to drive. These services are available to the general public. They may be privately or publically operated and include fixed-route transportation services (fixed schedules and fixed routes) while others are demand-responsive services (transport that is scheduled and routed upon request). Some services have eligibility requirements.

### 2.4.1 Public Transit Services

***Lexington Public Transit Authority (Lextran)***


Lextran celebrated 45 years of serving as Lexington's public transportation system in December of 2018. Lextran was incorporated as the Transit Authority of the Lexington Fayette Urban County Government in April of 1972. Prior to that time, there were several private transit systems in place beginning in 1874 when the Lexington Railway Company provided public transportation by horse-drawn stagecoaches.

Today, public transit is operated by Lextran and is supported through a local annual property tax of six cents per every one hundred dollars of assessed property value. This local support accounted for 67% of the Lextran budget in FY2019.

Lextran ridership peaked at 6 million annual trips from 2008 to 2011, during an economic recession and a period of high gas prices. This peak was followed by a decline in transit ridership that corresponded with a similar downturn in overall vehicular miles of travel and a period of lower gas prices, translating into a dip in transit ridership. However, since 2015 ridership has been increasing again to just over 4 million trips. The rate of people using public transit to commute to work has also increased to 2% of the workforce, per the American Community Survey.

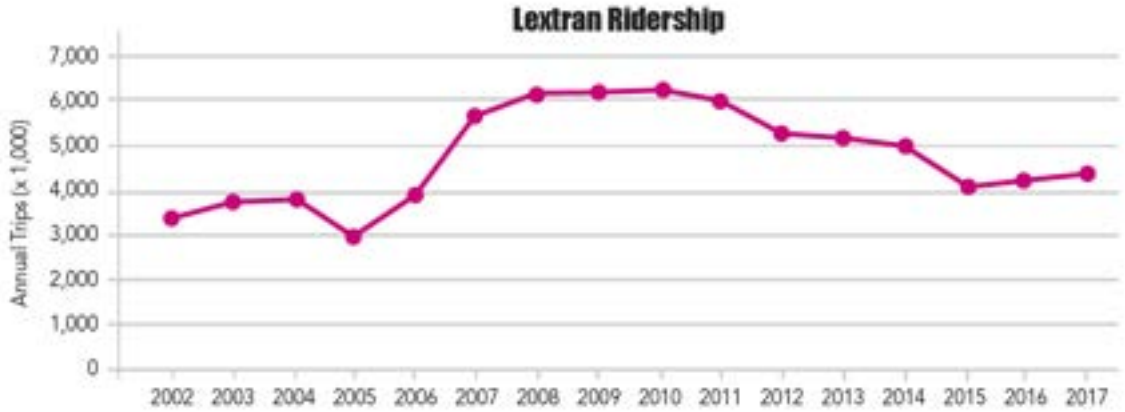



Exhibit 2.34 – Lextran Ridership
Source: Lextran

Lextran operates a fleet of 65 buses in Fayette County including a University of Kentucky campus shuttle service. The Lextran system currently consists of 27 bus routes that serve 928 bus stops (100 of which have bus shelters). Lextran operates at three levels of service each weekday; peak period, mid-day, and night service. Bus service runs from 5:30 a.m. until 12:30 a.m. Weekend service runs on a reduced time and frequency depending on the route.

Regular passenger fare to ride Lextran is $1.00 and includes unlimited transfers on a one-way trip. Fares have not increased since 2001. The $1.00 fare is among the lowest of any public transit system in the region, and relatively low when compared nation-wide. Reduced fare programs as well as a variety of passes are available to individuals that qualify. For example, a reduced fare is available to senior citizens. A "Class Pass" is also available to elementary, middle, high school and college students in Fayette County during the school year. Through a partnership with the University of Kentucky, Lextran created the BluPass program, which began July 1, 2015. This program allows UK students, faculty and staff to ride any Lextran route free of charge with their valid Wildcard ID. The BluPass program will continue through June 2019, with Lextran and UK negotiating continuing the service into the future.

The Lextran route system currently serves Fayette County in a radial fashion following arterial streets to the fringes of the urban area. Exhibit 2.35 shows the Lextran fixed route system and service area. Most of the Lextran routes originate from the transit center located in the downtown Central Business District. The system's focus on the transit center makes it the main transfer point for a majority of routes as they simultaneously converge downtown at the Transit Center. Since starting operations in 1992, the Downtown Transit Center has outgrown the capacity of the facility. This is evident when the majority of Lextran buses in service pulse into the transit center at similar times, overcrowding the center and hindering operations. Adjustments such as moving bus connection times and relocating some buses to the opposite side of the facility on High Street have been implemented in an attempt to create more space and better utilize the existing Center. However, this situation is not ideal and creates some confusion and hardship for riders that need to transfer in a limited time. Recognizing the need for more efficiency in the system, Lextran is considering using strategically placed crosstown routes, which would aid in making transfer connections between existing routes, while not concentrating all transfer connections at the transit center. Lextran continually monitors all routes and makes service adjustments, such as route contractions or expansions, based on ridership statistics and performance.

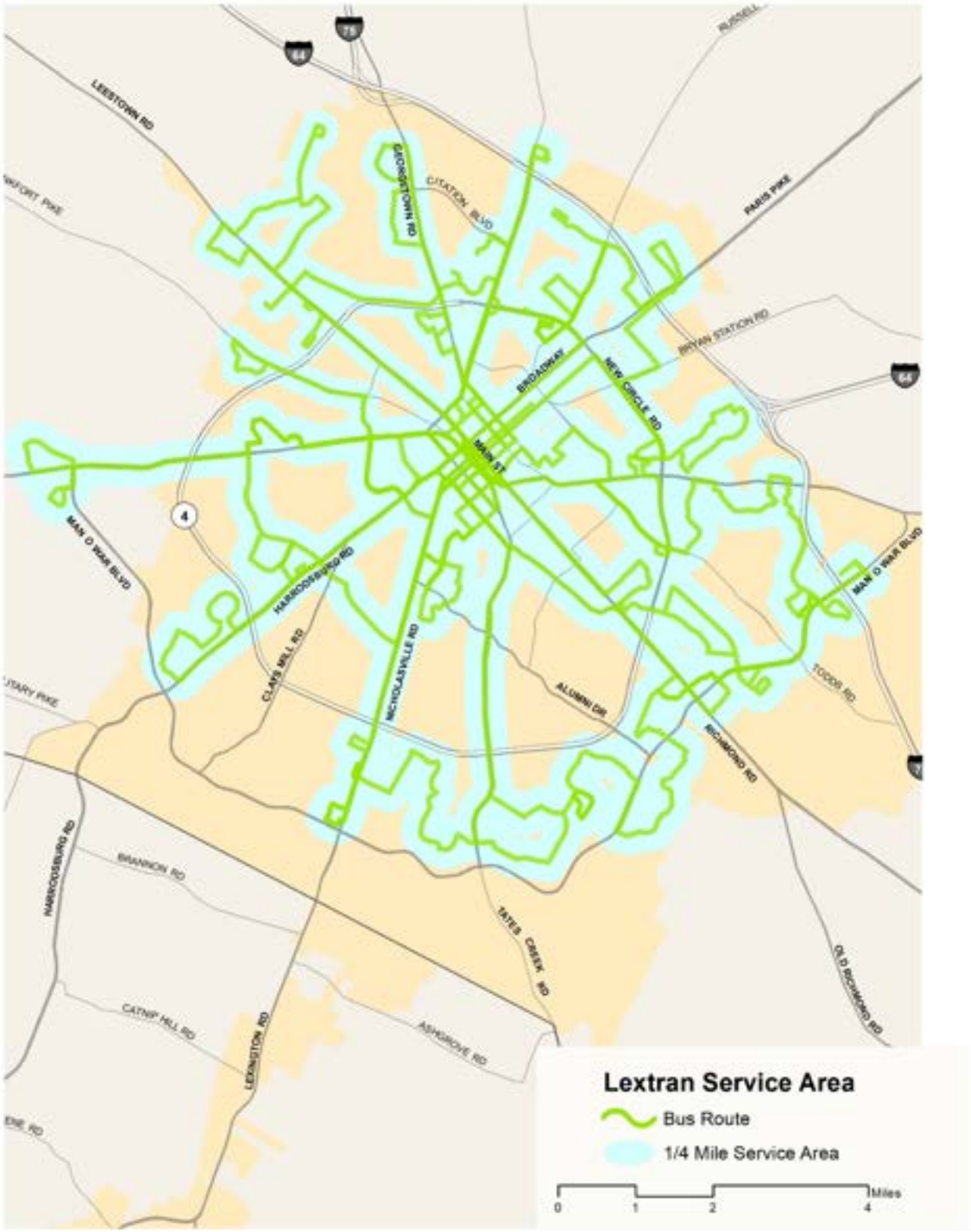



Exhibit 2.35 – Lextran Fixed Routes & ¼ mile Walkshed
Source: Lextran

Lextran continually implements and seeks new technology to make it easy and efficient for riders to use the transit system. The Interactive Voice Response (IVR) system that provides on-call service information to riders receives more than 40,000 calls per month. Bus stop signs featuring specific stop numbers allowing users to call the IVR line, enter their stop number, and receive departure times for the next bus. These times are updated continuously from real-time GPS information sent by the individual bus on that route. Users can also access real-time bus information via the MyStop application on smart phones or at a desktop computer. Improved real-time information and technology infrastructure is being planned for the transit center in 2019.


Lextran uses smart cards for faster boarding and fare payment. They can be preloaded with a variety of fare levels before entering a bus. Smart cards are contactless cards that users tap on the fare box when boarding, rather than dipping or swiping a magnetic stripe pass. The annual Class Pass was the first pass introduced in the form of a smart card and has proved to be a practical option that provides greater durability than a magnetic striped pass. Any student attending school in Fayette County for unlimited rides can utilize the Class Pass.

All Lextran routes are wheelchair accessible for persons with a mobility impairment and 100% of busses are equipped with wheelchair lifts. However, although Lextran buses are friendly to passengers with wheelchairs, not all bus stops and routes leading to them are. For those who cannot utilize the fixed-route service due to disability, Lextran contracts a door-to-door paratransit service WHEELS, managed by the Red Cross (see "Paratransit"). Lextran and LFUCG are also continually seeking to remedy stop access issues and to make spot improvements as able. Lextran conducted a recently completed field inventory of bus stop assess with funding support from the MPO. Data from this comprehensive inventory will help prioritize bus stop improvements.

Additional details regarding public transit can be found on Lextran's website (www.lextran.com).

## National Performance Measures for Transit Asset Management

Lextran has established Transit Asset Management (TAM) targets in accordance with Federal regulations enacted through the Moving Ahead for Progress in the 21st Century Act (MAP-21) for performance measures and target setting. It is the intent of these targets to improve transparency and accountability throughout the transportation planning processes. In July 2016, the Federal Transit Administration (FTA) issued a final rule requiring recipients of FTA funds to maintain and document minimum Transit Asset Management (TAM) standards. On October 24, 2018, the Lexington Area MPO's Transportation Policy Committee adopted and approved a resolution concurring with and supporting the performance targets for Lextran and BUS as outlined in their TAM plans. The MPO agrees to plan and program projects so that they contribute toward the accomplishment of those targets.

**MPO Transit Asset Management (TAM) Targets**

| Asset Category | Performance Measure | 2018 Actual Lextran | 2019 Target |
|---|---|---|---|
| Rolling Stock - All revenue vehicles | Age - % of revenue vehicles within a particular asset class that have met or exceeded their Useful Life Benchmark (ULB) | 9% | 20% |
| Equipment - Non-revenue vehicles | Age - % of revenue vehicles that have met or exceeded their Useful Life Benchmark (ULB) | 31% | 40% |
| Facilities - All buildings or structures | Condition - % of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model (TERM) Scale | 0% | 0% |

Exhibit 2.36 – Lextran & BUS Transit Asset Management Targets
Source: Lextran & Lexington Area MPO

### *NichTran & JessLex*

The Bluegrass Community Action Partnership (BGCAP) administers the Bluegrass Ultra Transit Service (BUS). BUS provides transportation services in a number of Bluegrass communities. In 2015, NichTran was launched as a deviated fixed-route public transportation service in the City of Nicholasville, which means the transit service operates on a fixed, regular route; however, pick-up and drop off locations may deviate from the route as long as they occur within ½ mile of the normal route and are scheduled 24 hours in advance. Since 2015 when NichTran started, it has grown from 850 trips in its first year to 2,266 trips in 2017.

BUS also operates the JessLex route between Nicholasville/Jessamine County and several stops in Lexington including Fayette Mall and the Lextran Transit Center. Launched in 2015, the Jess Lex route served 500 trips between the two counties, with ridership doubling to 1,000 trips in 2017. Passengers are required to make a reservation 24 hours in advance with a desired pick-up and drop-off location.

### *Inter-City Transit Services*

There are a number of inter-city bus services available to residents in the Bluegrass Region. These public transportation services provide an alternative way for regional commuters to reach the Lexington MPO Area for employment, retail, medical or other professional service. Some routes run regularly, whereas others require advance notice or a monthly subscription to the service. Several agencies operate these services as noted in Exhibit 2.37. For additional details visit each agency's website.

| Agency | Origin | Regular Service or On-Call | Destinations |
|---|---|---|---|
| Bluegrass Community Action Partnership | Frankfort<br>Danville | On-Call (24 hr) | Transit Center, Bluegrass Airport, Greyhound Station |
| Bluegrass Community Action Partnership | Nicholasville<br>Jessamine Co. | Regular<br><br>On-call (24 hr) | Transit Center, Fayette Mall, Walmart at Nichols Park |
| KY River Foothills Development Council | Winchester<br>Richmond | Regular w/ Monthly Fee & Subscription | UK, Downtown Lexington |
| KY River Foothills Development Council | Madison Co.<br>Clark Co.<br>Estill Co.<br>Powell Co. | On-call (48 hr) | Transit Center, Bluegrass Airport, Greyhound Station |
| Federated Transportation Services of the Bluegrass | Harrison Co.<br>Bourbon Co.<br>Nicholas Co. | Regular | Transit Center, Bluegrass Airport, Greyhound Station |

Exhibit 2.37 – Inter-City Transit Providers within the Lexington MPO Area
Source: LFUCG MPO

### *University of Kentucky Transit Service*

The University of Kentucky (UK) is a major trip generator with over 40,000 people coming into and moving within the Campus boundaries each day. The majority of weekday on-campus transportation is provided by two Lextran routes; Route 14, which operates as two overlapping loop routes (Blue and White) travelling in opposite directions and Route 26 (Green) which operates on a continuous loop from Greg Page and Shawneetown to the main Kroger Field bus stop. A third Lextran route, Route 27 (Yellow) operates on Sundays. As part of the Lextran system, these routes may also be utilized by the general public. UK Transportation Services operates two shuttle services which serve UK Healthcare employees only; the Orange Route and the Pink Route. Finally, UK HealthCare provides several shuttles via contract to transport patients and visitors between parking facilities and the UK Hospital.

The UK campus community is able to utilize public transportation through an agreement with Lextran; the BluPass program allows all students, faculty and staff to ride any Lextran route free of charge, simply by showing their valid Wildcard ID.

All campus routes - as well as off-campus Lextran routes - are viewable real-time on TransLoc Rider, a GPS-based bus locating system. TransLoc Rider is accessible at uky.transloc.com and via the free TransLoc Rider Android and iPhone apps. Additionally, you may send a text message to 41411 with UKY and the appropriate stop number to receive a message back listing the next three arrival times for that stop.

***Valley View Ferry Service***

The Valley View Ferry is located on KY Route 169 at the County line of Fayette and Jessamine Counties. The ferry is a free service operated by the Valley View Ferry Authority and is funded by the Kentucky Transportation Cabinet, the fiscal courts of Madison and Jessamine Counties, and the Lexington-Fayette Urban County Government. Valley View is the last remaining ferry on the Kentucky River and is the oldest year-round ferry service in the United States. Founded in 1785, seven years before Kentucky became a state, the Valley View Ferry is viewed by the community as a historic and cultural resource. The ferry provides passage across the Kentucky River for approximately 233 vehicles per day, substantially reducing the commute time between Fayette, Jessamine and Madison Counties. In FY 2018, the ferry carried 70,127 vehicles and 116,001 passengers. This is a 36% decrease in vehicles and a 30% decrease in passengers from 2012.

### 2.4.2 On-Demand Transportation Services

"Demand-response" transportation services transport individuals along non-fixed routes and require advanced scheduling by the customer. Public entities, nonprofits, and private providers may provide these services. The following demand-response services are available in the Lexington MPO Area.

***Paratransit***

Lextran's service "Wheels" is a door-to-door public transportation system for people residing within the Lextran service area whose needs cannot be fully met by the fixed-route system due to a disability. The service is operated in accordance with the Americans with Disabilities Act of 1990 which requires a fully accessible transportation service within ¾ mile of a fixed route bus service. Wheels is operated in cooperation with the Bluegrass Chapter of the American Red Cross. It has been in operation since 1978 and is available 365 days a year.

Wheels utilizes 61 vehicles including 48 mini buses with wheelchair lifts, 7 minivans with manual ramps, and 6 sedans. All qualifying residents with origins and destinations within the Lexington-Fayette County area can be accommodated when rides are prescheduled one day in advance.

Wheels provides more than 213,000 trips annually and travels over 1.9 million miles per year. In FY 2018, there were 6,179 registered customers and total ridership averaged 21,042 trips per month and 171,710 monthly service miles. This trend is expected to continue as the MPO population ages. This growth may place a greater demand on existing resources given Wheels passenger fares (currently $1.60 for most rides) must remain comparable to fixed-route passenger fares (currently $1) yet are considerable more expensive to operate. Passenger fares cover only a small portion of the overall operating cost of this federally-required demand-response service.

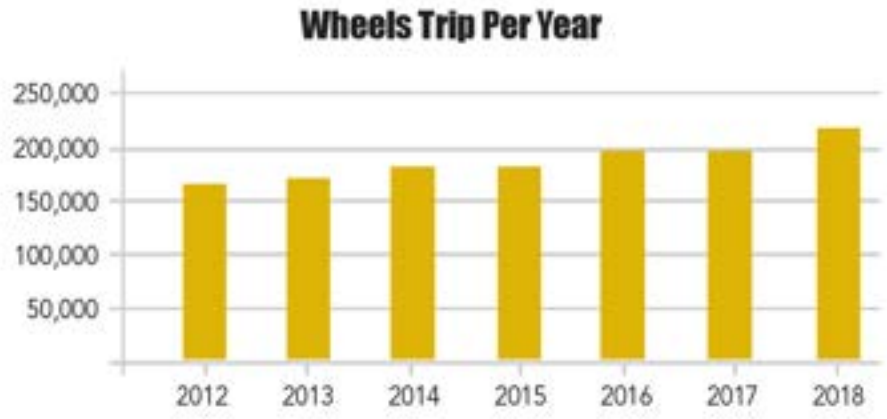



Exhibit 2.38 – Wheels Ridership & Trip Purpose
Source: Lextran Wheels

Wheels passengers use the service for a variety of trip purposes. Generally, the most frequent use is for medical trips (35%). One in five trips is for employment. Other trip purposes include personal errands, entertainment, shopping and education.

| Wheels Usage | 2018 | 2013 | 2003 |
|---|---|---|---|
| Annual trips (≈) | 213,000 | 165,000 | 104,000 |
| Annual mileage (≈) | 1,911,000 | 1,572,000 | 636,000 |
| **Trip purpose** | **2018** | **2013** | **2003** |
| Medical | 35% | 43% | 28% |
| Employment | 21% | 21% | 32% |
| Food/shopping | 12% | 9% | 20% |
| Education | 1% | 2% | 5% |
| Other | 31% | 25 % | 15% |

Exhibit 2.39 – Wheels Ridership & Trip Purpose
*Source: Lextran & Wheels*

In an effort to maximize efficiency of the service, Wheels currently utilizes RouteMatch Software in all vehicles to assist in producing schedules that maximize the daily efficiency by clustering and multi-loading passengers. In addition, Wheels uses Mobile Data Terminals and Global Positioning System (GPS) units to convey the manifest to the bus operators and track the location of the vehicles.

### *Human Service Transportation Delivery*

Door-to-door transportation for non-emergency medical treatment and purposes is provided to people who are eligible for Medicaid, Vocational Rehabilitation and Department of the Blind service recipients. These services are provided by the Federated Transportation Services of the Bluegrass (FTSB) in Fayette County and by the Bluegrass Community Action Partnership in Jessamine County.

### *Independent Transportation Network*

The Independent Transportation Network of the Bluegrass (ITN of the Bluegrass), an affiliate of ITN America, provides rides to people who are 60 years and older as well as to people of any age with visual impairments. ITN is a fee-based membership service that is supported by both public and private resources. It includes a network of volunteer drivers and a dispatch/scheduling system. Rides are available 7 days a week, 24 hours a day for any purpose when the origin and destination is within Fayette County and northern Jessamine County. An emphasis is placed on door-through-door, arm-through-arm service meaning drivers may assist riders, which can be helpful for people who are elderly, not feeling well or need help carrying packages. ITN is a resource for those who do not qualify for Paratransit or Human Service Transportation. ITN of the Bluegrass currently has about 450 members and provides about 800 rides per month.

### 2.4.3 Shared Mobility Services

Ridesharing plays an important role in reducing the number of commuters driving alone and providing people with access to rides when they cannot or choose not to drive. In the last 5 years, the use of smart phone technology has skyrocketed the ability for ride-hailing and ride-sharing services to have a major influence on how people choose their transportation modes. Many of these services are considered peer-to-peer services, because it directly connects persons with empty seats in their car to people that need a ride. Sharing services extend beyond automobiles and also include bike share and scooter share programs, connecting people with personal mobility devices when they need them.

#### *Ride Hailing Services*

The two most notable ridesharing services, Uber and Lyft, are prime examples of ride hailing services, in which the user hails a ride, is picked up at their location and taken to their destination, similar to a traditional taxi service. There is no doubt that these services exploded in popularity and offered new options for people to fill their mobility needs. The transportation and ride sharing industry is changing rapidly and it may not look like it does today. The three trends that are driving these rapid changes are autonomous vehicles, on-demand services and electric fleets, all of which, in concert, could make ride-hailing services a dominant force in the future.

#### *Bike & Scooter Share Programs*

Bicycle, electric bike (e-bikes) and scooter sharing programs have grown substantially in recent years as private companies have launched programs in cities across the world and the United States. In Lexington, a one year pilot program began July 1, 2018 with the launch of 300 dockless bikes provided by one private vendor. There were 25,000 trips logged by users within the first six months of the pilot. Data from these trips is available to the MPO and is being analyzed to help the MPO determine where facility improvements are needed given the volume and distribution of bike share trips. In the near future, a permit process will be in place in Lexington to allow more companies to launch bike and scooter share programs within the Lexington market. These programs have been popular both in Lexington and in other communities and have helped reduce short distance vehicular trips. It is anticipated that approximately 500 scooters will initially be launched in Lexington.

#### *Carpooling*

Next to driving alone, carpooling is the most common means of commuting in the Lexington area. Today, carpooling in the MPO region has declined significantly from its peak in the 1980s dropping from 23 to 12.2% of all work-related trips in Jessamine County and from 18% to 9.5% in Fayette County. Still, carpooling contributes greatly to lessening congestion on regional roadways and reducing fuel consumption and emissions. Carpooling is most common among people with long commutes. Many carpools are formed via personal contacts, neighbors and co-workers. While the MPO no longer provides software-based ride-matching services, Enterprise's vanpool program (administered on behalf of Lextran) offers ride matching services to clients who call in search of a vanpool program. There are also a growing number of private companies that are offering ride matching services and apps, often at no charge to the user.

### *Vanpooling*

Vanpooling allows even larger groups of individuals to share rides, further decreasing demand on the roadway network and providing both individual and community-level savings on fuel, energy, vehicle and roadway maintenance. A regional vanpool program is currently administered by Lextran (operated under contract by Enterprise Commute) and includes 7 vanpools and 58 members (average of 9 members per van) with an average round trip of 53 miles per van. Vanpools must currently have an origin or destination within Fayette County.

### *Car Sharing*

Car sharing is a service where people have on-demand access to a fleet of vehicles so that they may rent a car for short periods of time, often by the hour. This service is attractive to people who only require the use of a vehicle occasionally and may allow people to more easily utilize bicycling, walking and transit for regular trips, foregoing regular, day-to-day use of a private vehicle. According to The Economist, car sharing can reduce car ownership at an estimated rate of one rental car replacing 15 owned vehicles.


The University of Kentucky currently operates a small car sharing program through Zipcar with a fleet of 2 vehicles. Car sharing opportunities for greater Lexington are currently in the exploratory phase.

## 2.4.4 Regional, State & National Passenger Services

In today's mobile and global economy, many travelers seek connectivity to regional, statewide and national destinations via public transportation service. Several fare-based passenger options into and out of the Lexington area are available to residents, recreational and business travelers that need access to destinations by means other than personal automobile.

### *Passenger Bus*

Regularly scheduled Inter-city passenger bus service to and from Lexington is provided through Greyhound. Greyhound is a fee-based charter services that is available to the public. Service is offered along fixed routes to many cities throughout the region, state and country. For many travelers, particularly those who do not own a vehicle, charter bus is the most economical way to travel outside of the Bluegrass Region.

### *Passenger Rail*

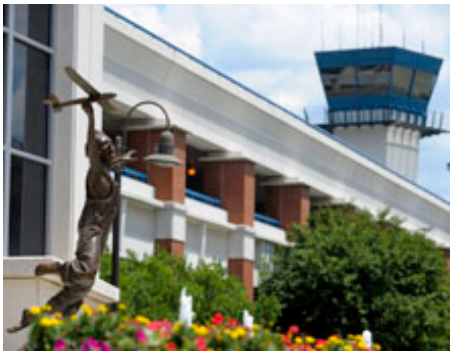
There are currently no passenger rail lines servicing the Lexington area. The nearest passenger rail service is provided by Amtrak in Cincinnati. In recent years, there has been growing public interest in a passenger rail service connecting Lexington, Frankfort, Louisville and Northern Kentucky. A cost-feasible plan to provide such a service has yet to be realized. The most comprehensive study of the feasibility of passenger rail was commissioned by the KY Transportation Cabinet in 1999. See the "*Examination of I-75, I-64 and I-71 High Speed Rail Corridor Study*."

## *Passenger Air*

Lexington Bluegrass Airport (LEX) serves a population of over 1.5 million residing in over 15 surrounding counties in Kentucky. LEX offers commercial flights and a variety of corporate and general aviation services. The Bluegrass Airport is located in western Fayette County along Versailles Road and Man o' War Boulevard, 4 miles west of downtown Lexington. The airport is served by major airlines, offering direct flights to a host of US Cities, with global connections.


The airport updated their Master Plan in 2013 which focused on a comprehensive assessment of "core" infrastructure needs that take into consideration input from stakeholders and community partners. The Bluegrass Airport Master Plan includes the following long-term improvement projects.

- Taxiway System Improvements
- West General Aviation Campus – (Ph. I)
- Runway 4-22 Rehabilitation & Safety Improvements
- International Customs Facility
- Parking Lot Expansion – (Ph. I & II)
- West General Aviation Campus – (Ph. II & III)
- East General Aviation Campus Redevelopment
- Runway 9-27 Extension & Widening
- New Air Traffic Control Tower



## 2.5 Safety & Security

### 2.5.1 Safety

Every year about 40,000 people are killed on our nation's roads and highways - and more than 2 million people are injured. These traffic crashes can be devastating for the individuals involved and they also impact family members, friends and co-workers. Societal costs run into the hundreds of billions of dollars due to lost productivity, property damage, medical costs, emergency services and increased travel time due to delays. According to the KY 2016 Traffic Collision Facts Report, the statewide "Comprehensive Cost" of collisions was a staggering $19 billion, just for the state of Kentucky. For these and many other reasons the Lexington Area MPO has made transportation safety a top priority. The MPO is committed to the mission and goals of the Kentucky Transportation Cabinet Strategic Highway Safety Plan (2015-2019) which include:

***Mission:*** ***To reduce Kentucky's highway fatalities and serious injuries.***

***Vision:*** ***Through public and private partnerships, achieve the most improved and sustainable downward trends in highway fatalities and injuries in the nation.***

***Goal:*** ***To reduce the 5 year rolling average number of annual highway fatalities to 597 by Dec. 31, 2019, in line with the broader goal of achieving a 50% reduction in average annual fatalities between 2014 and 2030 and moving Kentucky roadways Toward Zero Deaths.***

To help achieve these goals, the MPO reviews and analyzes technical and statistical data of local and state transportation facilities on an on-going basis in an effort to be proactive in identifying and addressing safety issues for all modes. The MPO promotes and facilitates a number of safety improvement techniques including congestion management strategies, access management, intersection improvements, bike and pedestrian facilities, traffic calming, incident management and educational campaigns. In short, safety is emphasized as an on-going commitment in all the MPO's subcommittees and work programs.

#### Critical Crash Rates

The KYTC determines and assigns a Critical Crash Rate (CCR) to state roadways throughout Kentucky. The CCR for each roadway segment is based on the expected crash rate of similar facility types (i.e. road class, urban vs. rural) across the state. Critical Crash Rates above 1 indicate the segment experiences more collisions than is typical for roadways of a similar type. The higher the CCR is above 1, the greater the disparity. Exhibit 2.41 shows the percentage of roadway segments in Fayette and Jessamine County that have CCRs of various ranges.

| Fayette County<br>Critical Crash Rate of Roads - 2016 | | Jessamine County<br>Critical Crash Rate of Roads -2016 | |
|---|---|---|---|
| Total Highway Mileage Evaluated = 504 miles | | Total Highway Mileage Evaluated = 133 | |
| % of Roadways | CCR | % of Roadways | CCR |
| 54% | <1 | 37% | <1 |
| 32% | 1-2 | 42% | 1-2 |
| 10% | 2-3 | 9% | 2-3 |
| 3% | 3-4 | 5% | 3-4 |
| 1% | >4 | 7% | >4 |

Exhibit 2.41 – Critical Crash Rate of Roads in the Lexington MPO Area
Source: Kentucky State Police (KSP)

## Collision Data

### *Crash Types*

Crashes can and do occur on every road in the MPO area. About 94% of those crashes have human error as a direct or contributing factor to those collisions, which include distracted driving, aggressive driving, speeding, or driving under the influence of drugs or alcohol. Figure 2.42 below summarizes the type and manner of crashes in the MPO Area.

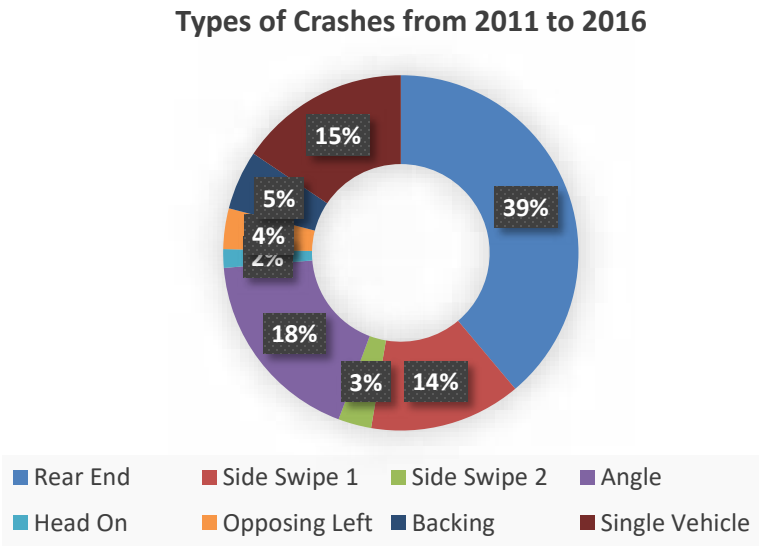



Exhibit 2.42 – Crashes by type in Fayette County and Jessamine County from 2011-2016
Source: Kentucky State Police

Of vehicle-to-vehicle collisions, rear-end collisions represented the majority of collisions with an average of 4,867 over the five year period, accounting for 39% of all collisions. Sideswipe and angle collisions are the next most common collision types averaging 17% and 18% respectively.

### *Crash Rates*

Over the five year period from 2012-2016, the total average number of annual collisions in Fayette County was 12,700 which steadily rose to over 14,000 in 2016, a 12% increase over the previous 4 years, but relatively consistent with the rise in vehicle miles travelled. Jessamine County's total average during the same time was about 1,400 collisions per year, which steadily rose to about 1,600 in 2016, which was a 15% increase from the previous 4 years. However, the total vehicle miles of travel in the MPO area also increased during this time period; and while collisions by VMT increased during that time as well, the rate is still lower than national or state averages.

### *Fatality Rates*

Even with an increase in the total number of collisions in 2016, the average of all collisions that resulted in a fatality or serious injury reduced from 25% to 16% of collisions. Fayette County had an average of 29 traffic fatalities per year during the five year period (from 2012-2016), correlating to 0.2% of motor vehicle collisions. Jessamine County had an average of about 7 fatalities per year, which amounted to 0.3% of all the motor vehicle collisions in Jessamine County.

When looking at fatality rates in relation to VMT, the total number of fatalities per VMT has increased. However, the rates are still much lower than national or state averages.

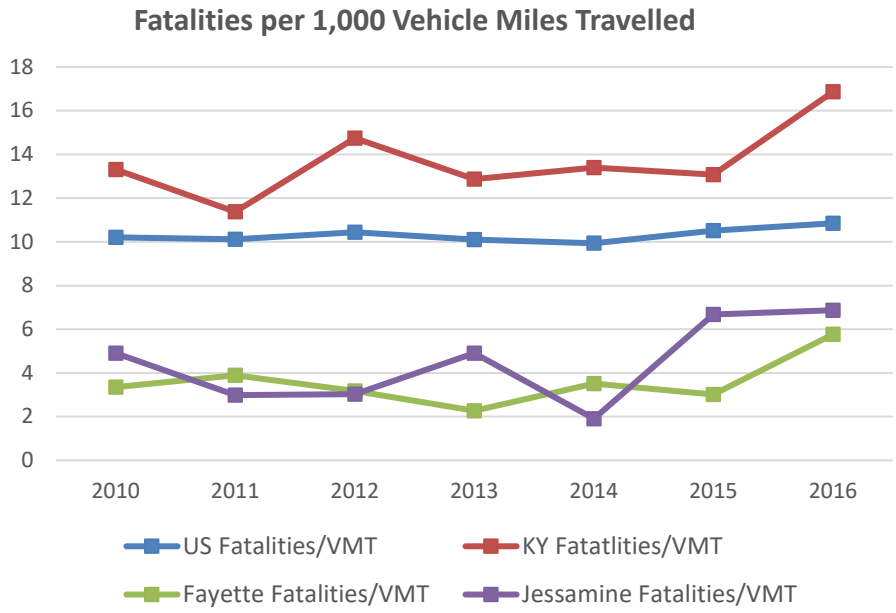



Exhibit 2.43 – Comparison of Fatalities per 1,000 VMT, from 2010-2016
Source: Kentucky State Police

About one-third of fatal collisions involved aggressive driving as a contributing factor, which has increased in recent years. There was a reduction of drug and alcohol related fatal crashes from the previous 5-year reporting period – presumably due to increased DUI enforcement programs. Collectively, aggressive driving, speeding, and alcohol contributed to about 60% of the fatal crashes in the MPO area in the five-year period.

***Pedestrians and Bicycles***

Like all crashes, vehicles and bike/ped crashes can occur on any roadway; however, they are of particular concern because of the greater potential for serious injuries and fatalities.

Vehicular collisions with a pedestrian or bicycle averaged 285 per year from 2012-2016 (more than double from the previous 5-year period), representing 2.0% of total collisions. Ninety-two percent of those resulted in injury (compared to a 25% injury rate for vehicle-to-vehicle collisions) and there were 33 fatalities (2012-2016). Higher injury and fatality rates in vehicle-to--pedestrian collisions result from the offset in physical prowess between vehicles and pedestrians; thus it is important to recognize and work to minimize pedestrian-related collisions. Speed reduction is key to reducing pedestrian and bicycle injuries and death. This is effective both in reducing the severity and number of collisions.

The MPO's 2018 Bicycle and Pedestrian Master Plan outlines a comprehensive set of strategies to reduce the incidence of bicyclist and pedestrian injuries and fatalities.

## National Performance Measures for Safety

As discussed in prior sections, MAP-21 & the FAST ACT require Transportation Performance Measures (TPM). On February 27, 2019, the Lexington Area MPO's Transportation Policy Committee adopted a resolution to support the KYTC's Safety Performance Targets to achieve a significant reduction in the traffic fatalities and serious injuries on all public roads. In doing so, the MPO agrees to pursue and program projects that will help achieve these targets. To that end, the MPO's criteria for prioritizing projects adds weight to projects on corridors with critical crash rates, collision histories and bicycle and pedestrian safety concerns.

The KYTC now establishes annual baselines and targets for safety. The MPO will also track data for these criteria and monitor the area's contribution to achieving the State's targets. Below are the current targets and a comparison of the MPO's standing in relation to the statewide totals. Note that the MPO area represents 8% of the statewide population.

| | Statewide | | LexMPO | |
|---|---|---|---|---|
| | Baseline: 5-Yr Avg. (2013 – 17) | Target: 5-Yr Avg. (2015-19) | Baseline: 5-Yr Avg. (2013- 17) | % of Statewide Baseline |
| **PM 1.1: Number of Fatalities** | 737.4 | 737 | 38.2 | 5.2% |
| **PM 1.2: Number of Serious Injuries** | 3124.8 | 2991 | 210.4 | 6.7% |
| **PM 1.3: Fatality Rate / 100 M VMT** | 1.521 | 1.5 | 0.42 | |
| **PM 1.4: Serious Injury Rate / 100 M VMT** | 6.451 | 6.07 | 2.36 | |
| **PM 1.5: Non-Motorized Fatalities & Serious Injuries** | 277.8 | 276 | 31.2 | 11.2% |

*Exhibit 2.44 – Transportation Performance Management Safety Targets*
*Source: Kentucky Transportation Cabinet*

**Note: KYTC will always have the most up-to-date TPM information, and the information presented above was as of April 2019.*

### *KYTC Notes Regarding FY 2018 & FY 2019 Safety Targets*

Five-Year Rolling Average | Each target is based on a 5-year rolling average, which is the average of five individual, consecutive points of data. This provides a better understanding of the overall data over time without eliminating years with significant increases or decreases.

Fatalities | The number of fatalities on Kentucky's public roads has been increasing the past four years, after a historically low number of fatalities in 2013. The FY 2019 target represents a *reduction* in total fatalities in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.

Serious Injuries | This target represents a *reduction* in total serious injuries in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.

Fatality Rate (per 100M VMT) | This target represents a *reduction* in the fatality rate in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.

Injury Rate (per 100M VMT) | This target represents a *reduction* in the serious injury rate in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.

Non-Motorized Fatalities and Serious Injuries | This target represents a *reduction* in total non-motorized fatalities and serious injuries in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017

### 2.5.2 Security

Security of the transportation system goes beyond safety and includes planning for natural disasters, or preventing and responding to intentional harm or tampering. An important element of security planning is to ensure that the transportation system provides redundancy so that in the event of an emergency there are more ways than one for citizens to evacuate an area and likewise multiple ways for emergency personnel to enter an area. Parallel routes and good street connectivity enhances access to and along corridors and provides for this redundancy, which is one reason why the MPO has supported efforts by LFUCG to establish street connectivity standards.

The MPO works to improve security through interagency coordination with governmental agencies and groups focused on security through the Transportation Technical Coordinating Committee (TTCC) and the Project Coordination Team (PCT). Strategies to further enhance transportation security are discussed in Chapter 4.

## 2.6 Environment

Enhancing the environment is a goal of the MTP and the Comprehensive Plans of both Fayette and Jessamine County. By federal law, the MPO is responsible for ensuring that the region's plans for transportation infrastructure conform to National Ambient Air Quality standards. However, transportation can impact more than just air quality. Transportation policies and infrastructure can be linked to a variety of environmental issues including water quality, wildlife habitat modification, land absorption, noise and light pollution, energy consumption, air pollution, climate change and impacts to natural and cultural resources.

For federally-funded transportation projects, environmental effects are considered during project planning, design and engineering as part of a required environmental review process. This process addresses NEPA requirements to assess, avoid and/or mitigate negative impacts and is intended to result in decisions that are "based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment." Agencies that oversee environmental, historical and cultural programs and protection efforts are also consulted during the development of the MTP so that potential issues can be flagged prior to entering more detailed project development phases.

### 2.6.1 Air Quality

Air quality monitoring helps determine the impact of the transportation system on the environment. Vehicles (or mobile sources) are a major source of urban air pollution. Technology (cleaner vehicles and cleaner fuels) will continue to work to reduce vehicular pollution, but more people living in an area generally equates to more vehicles on the road. As the population continues to grow into the future, it will be critical to meet this increased travel demand in an efficient and multimodal manner, or additional congestion may ensue, potentially compromising air quality.

#### *Ozone*

In November 1990, Fayette and Scott Counties were designated by the United States Environmental Protection Agency (USEPA) as a "non-attainment" air quality area for the pollutant ozone because of violations of National Ambient Air Quality Standards (NAAQS). The Kentucky Environmental and Public Protection Cabinet's Division for Air Quality (EPPC) submitted a re-designation request for the area in response to more consistent monitoring of attainment data. In November 1995, the area was re-designated to "attainment" but is required to maintain standards by showing conformity to the State Implementation Plan (SIP).

USEPA revised the standard for ozone in April 2004. The new "8-hour" standard requires ozone levels to be 0.08 parts per million (ppm) rather than 0.12 ppm, and applies this standard to an 8-hour average concentration rather than a 1-hour average. With this new standard, the Lexington area was designated in attainment when final designations were determined on June 2004.

USEPA again revised the standard for ozone in May 2008 and October 2015. It retained the 8-hour average time period but dropped the concentration level to 0.075 ppm, then to 0.070 ppm,

respectively. As seen in Exhibit 2.45, the Lexington area has maintained attainment of the ozone standard. However, ozone concentration readings are trending close to the new standard.


*Exhibit 2.45 – Ozone Levels in the MPO Area*
*Source: LFUCG MPO*

### *Ozone Forecasting and Modeling*

One way the Lexington Area MPO staff monitors air quality is by using an ozone forecasting model. The model is run during the ozone season, May - September, to predict the Air Quality Index level for the next day. The forecast is calculated and an Ozone Action Day bulletin is emailed to the media, local, state and federal government officials when it indicates a potential ozone violation of standards in order to alert individuals that are sensitive to poor air quality including the elderly and people with asthma. Ozone Action Day bulletins are also distributed to promote voluntary efforts that can be taken to help reduced air pollution. A 4-day forecast is completed each weekday. The forecast is updated daily on the MPO web site www.lexareampo.org).

| The Ozone Scale & Air Quality Index (AQI) | |
|---|---|
| 0 - 50 | Good |
| 51 - 100 | Moderate |
| 101 - 150 | Unhealthy / Sensitive Groups |
| 151 - 200 | Unhealthy |
| 201 - 300 | Very Unhealthy |
| 301 - 500 | Hazardous |

### *Particulate Matter*

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. These particles come in a wide range of sizes and can remain suspended in the air for extended periods. Fine particles, under 2.5 microns in diameter (PM 2.5), result from fuel combustion by motor vehicles and other sources. Coarser particles, up to 10 microns in diameter (PM 10), generally consist of windblown dust, and are released from agriculture and crushing and grinding operations.

In December 2004, USEPA designated new PM standards. The PM 2.5 standards (annual and 24-hour) were added to the existing standard for PM 10. The Lexington area had attained the PM 10 standard for some time and continues to record acceptable levels. Air quality monitor readings in recent years indicated Lexington was close to exceeding the PM 2.5 standard. However, in December 2008, the Lexington area was also designated in attainment for fine particulates and air quality readings improved in the following years.

The USEPA revised the PM standard again in December 2012. Exhibit 2.46 shows how the Fayette County air quality monitor readings compared to the standard. Particular matter concentrations in the MPO have continued to decrease over time and are trending well below the standard.

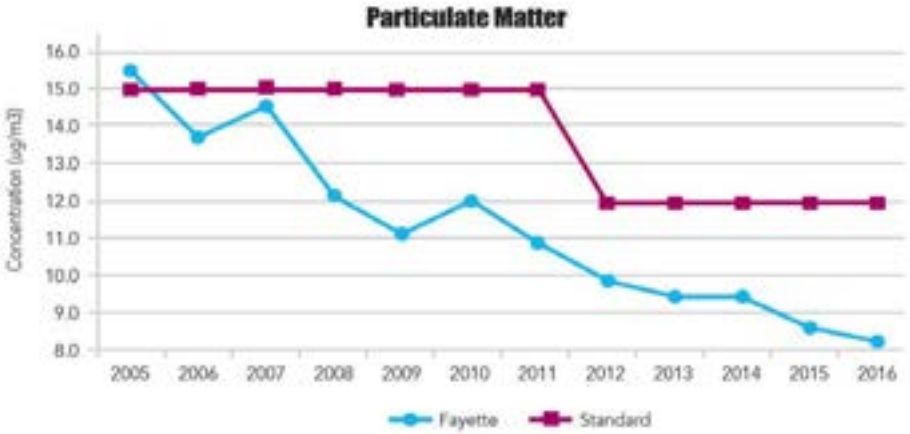



*Exhibit 2.46 – Particulate Matters in the MPO Area*
*Source: LFUCG MPO*

### *Greenhouse Gas Emissions*

Greenhouse gases trap heat within the earth's atmosphere. Although most GHG emissions occur naturally, human activity generates some as well. Carbon dioxide ($CO_2$) emissions account for more than 80% of U.S. GHG emissions. These emissions contribute to climate change and could lead to harmful effects such as sea-level rise and global hydrological changes. In contrast to most pollution trends, emissions of GHG have been rising from all sources. Transportation's contribution to GHG is approximately one-third of the total.

Lexington-Fayette County has adopted a plan, the Empower Lexington Plan, which addresses GHG and energy uses from multiple sources including transportation.

# Chapter 3 Developing the Plan

The MPO sought public input and reviewed transportation trends to identify the needs and desires of the Region. We then analyzed what financial resources we can expect to be available to us, and prioritized investments to help us meet our regional transportation goals. A summary of major plan development steps follows.

## 3.1 Identifying Needs

The MPO's analysis of the existing transportation system and travel demand needs are outlined in Chapter 2. This included a look at our region's population and employment growth, a review of where and how people are traveling now and will in the future and an assessment of how well the existing and future system can meet those needs.

## 3.2 Gathering Input

Community and stakeholder input was the basis for the MTP Goals and Objectives. The goal of the participation process was to provide early and ample opportunity for citizens and stakeholders to impart their ideas, opinions and values into the MTP and to influence decisions made about transportation investment. Public input was gathered through a community survey, public meetings and social media. The MPO also coordinated with transportation agencies and stakeholders to inform the MTP update.

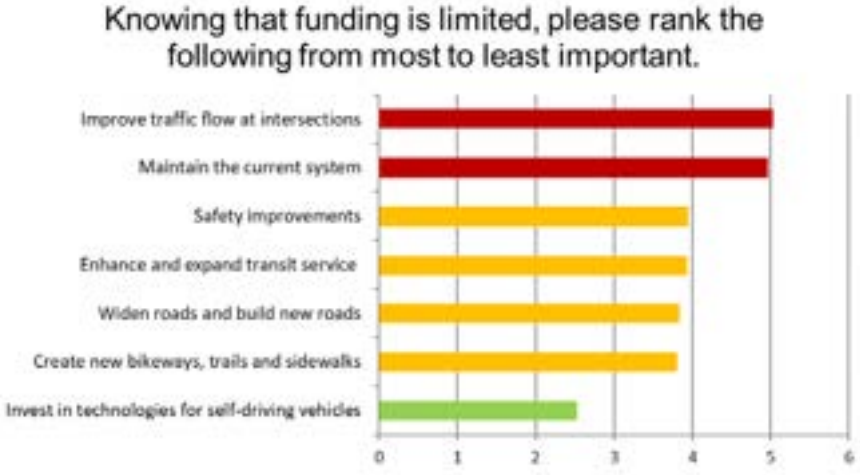
### 3.2.1 Community Survey

During the summer of 2018, the MPO distributed a community survey to inform the MTP update and to gauge public opinion on current and future transportation issues. Surveys were distributed through email lists maintained by the MPO, City Council/Commissions and Neighborhood Associations and promoted extensively through social media, television and print ads. Hard copies were posted at public libraries. In-person surveys were conducted by MPO staff at the Lextran transit center to target both choice transit riders and transit-dependent riders. Paid advertisements were also published in the Jessamine Journal and targeted to Jessamine County social media users (Facebook) in an attempt to boost Jessamine County response rates. Highlights from the survey follow, with complete results found in Appendix C.

Just over 2,200 individuals responded to the transportation survey. The survey was self-selected and therefore not statistically valid, however it still provides valuable insight into public opinion. Ninety percent of respondents were from Fayette County, with the remaining 10% being from Jessamine (5%) and surrounding counties (5%). Eighty-four percent of respondents usually drive as their primary mode of travel, but 65% also sometimes bike, walk, carpool, use transit and ride services. Forty percent of people would like to use transit more in the future, while 1 in 3 people would like to bike and walk more. One in four people are interested in riding in self driving cars and using other ride services

(Uber/Lyft); yet only 1 in 10 people said they would be interested in not owning a car in the future. Knowing that just over 50% of Fayette County workers live outside the county boundary, the MPO asked whether employees would like to live closer to where the work; only 1 in 5 said yes, implying continued demand for out-of-county commutes along major arterials.


When asked what is the biggest transportation challenge facing the Region, 50% cited traffic congestion, while 25% noted the lack of transportation options. Respondents said the top transportation priorities were improving traffic flow at intersections and maintaining current infrastructure. The second tier of priorities included safety improvements, enhanced transit service, bicycling, walking and widening or building new roads.




The public was also asked what factors we should consider when prioritizing transportation projects and initiatives. Top considerations were projects that address bottlenecks, those that improve the reliability and safety of travel and projects that keep our system well maintained. The next tier of priorities were improving street connectivity, walking/bicycling improvements, and supporting infill, redevelopment and urban design that encourages multimodal travel.


Input from the survey was used to craft the MTP's Goals & Objectives and Project Prioritization Tool. Additional survey questions and detailed responses are available in Appendix C. An extensive number of open-ended responses were also collected and compiled by the MPO.

### 3.2.2 Engaging Stakeholders

Developing and implementing transportation plans and projects requires coordination and cooperation among many agencies at the national, state, regional and local levels. During the MTP update the MPO coordinated with the following:

***Transportation Agencies***

The MTP update was the primary focus MPO's Transportation Technical Committee (TTCC) and Transportation Policy Committee (TPC) during the latter part of 2018 and early 2019. Agencies represented on the TTCC include:

- LFUCG Divisions of Planning, Engineering and Traffic Engineering
- Representatives from Jessamine County
- Representatives from the cities of Nicholasville and Wilmore
- University of Kentucky Parking and Transportation
- Maintenance, operations and public safety agencies
- Bluegrass Area Development District (BGADD)
- Federated Transportation Services of the Bluegrass (FTSB)
- Bluegrass Community Action Partnership (Bluegrass Ultra Transit)
- Lextran
- LexPark
- Kentucky Transportation Cabinet (KYTC)
- Federal Highway Administration (FHWA)
- Bluegrass Airport
- RJ Corman Railroad Company

Feedback from the MPO's TTCC, Bicycle & Pedestrian Committee and Congestion Management Committee informed the Transportation Policy Committee on key issues, goals, policies and projects.

### *Transportation Decision-Makers*

On-going dialogue and input from TPC members and the stakeholders they represent informed the MTP's development. Publically televised presentations to the TPC included:

- a summary of local transportation data, issues and trends
- public opinions gathered through the survey
- projected future revenue sources
- potential future investment strategies and projects
- a summary of the public's reaction to the draft plan

### *Stakeholder Agencies*

Per federal law, letters and emails were sent to all key transportation stakeholders in the MPO Participation Plan's Coordination/Consultation contact list (see the MPO Participation Plan Appendix A) requesting their input on the draft MTP. Per CFR 450.316 and CFR 450.210, these contacts included:

- Local planning/land use agencies
- Local economic development agencies
- Environmental protection/natural resource/conservation agencies
- Historic preservation agencies
- Airport operators
- Providers of freight transportation services
- Private and non-profit providers of transportation
- Other affected public agencies
- Representatives of: public transportation employees, users of public transportation, users of pedestrian walkways and bicycle transportation facilities, people with disabilities

### *The Public*

In addition to the public survey at the outset of the plan, the MPO invited the public to review and provide input on the draft MTP document via press releases, email lists, social media, a public meeting and the MPO website. Public response to the draft was generally positive. A summary of outreach conducted for the draft document and of the written public comments and are in Appendix C.

### *Targeted Populations*

A critical consideration in transportation planning is the equitable distribution of transportation services, facilities and resources within the community without regard to income, race, age, ability and other socio-economic factors; as well as avoiding any negative impacts or burdens on minority and low-income populations. The MPO sought participation from traditionally under-served and under-represented individuals in the development of the MTP by reaching out to the businesses, organizations and media contacts that serve minorities and other under-represented groups (see Appendix B and C of the MPO Participation Plan). The MPO distributed requests to these contacts asking them to complete and promote the transportation survey and to post notices on the availability of the public draft in their place of business. The MPO also used paid advertising through social media that allowed the MPO to micro-target ads based on socioeconomic and geographical user data.

## 3.3 Travel Demand Forecasting Model

In the transportation planning process, evaluating various investment options, such as new and expanded roadways or transit service, helps decision-makers determine the best future course of action. Transportation planners rely on travel demand models (TDM) to help predict changes in travel demand and patterns in response to changes in regional development, demographics, transportation infrastructure and services.

During 2013-2014, a highly specialized travel demand forecasting model was developed and calibrated for the Lexington MPO Area in cooperation with the Kentucky Transportation Cabinet (with a "base year" of 2012). Building upon that model in 2018, the socio-economic data and transportation network connections were updated for a new 2017 base year. The Lexington Area TDM takes current socioeconomic data (2010 U.S. Census, with updates from the Kentucky State Data Center), including population and employment, and establishes a relationship between these variables and travel behavior (or trip making). Future year TDM forecasts (up to 2045) are based on estimated changes in socioeconomic data and anticipated land use, assuming overall travel characteristics will remain constant over time. Multiple data sources were utilized to update and calibrate the TDM for the Lexington Area shown in Exhibit 3.1 below.

| TDM Data Inputs | Source |
|---|---|
| Population (by age)<br>Housing Units (total, occupied & unoccupied)<br>Population Forecasts from 2020-2045 | 2010 US Census<br><br>Kentucky State Data Center |
| Workers<br>Vehicles | American Community Survey |
| Employment (by sector) | Woods & Poole Economics |
| Employment (by location) | Kentucky Workforce Cabinet (ES-202) |
| Land Use (commercial/residential)<br>Schools (public, private & colleges) | Fayette Co. Comprehensive Plan<br>Jessamine Co., Nicholasville, Wilmore Joint Comprehensive Plan<br>Fayette Co. Schools District Facilities Plan |
| Travel Pattern Data (Cell phone-based) (2012) | AirSage |
| Road Network & Characteristics | KYTC Highway Information System |
| Roadway Network Capacity | Highway Capacity Manual |
| Transit Routes*<br>Transit Stops*<br>Ridership* | Lextran |

** Future use & analysis only*

Exhibit 3.1 – Lexington Area MPO Travel Demand Model Inputs

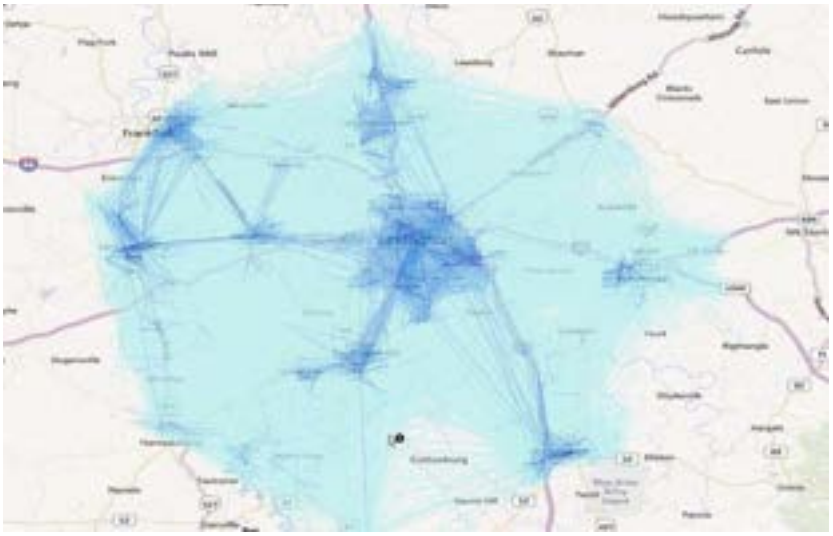


Exhibit 3.2 – Example of Travel Pattern (AirSage) Data for the Lexington Area MPO

Lexington's TDM is based on data from nine counties in central Kentucky. This regional focus allows the model to account for longer distance trips into and out of Fayette and Jessamine County. Counties included in the regional model are shown in Exhibit 3.3 including Bourbon, Clark, Fayette, Garrard, Jessamine, Madison, Mercer, Scott and Woodford and a small portion of Franklin Co.

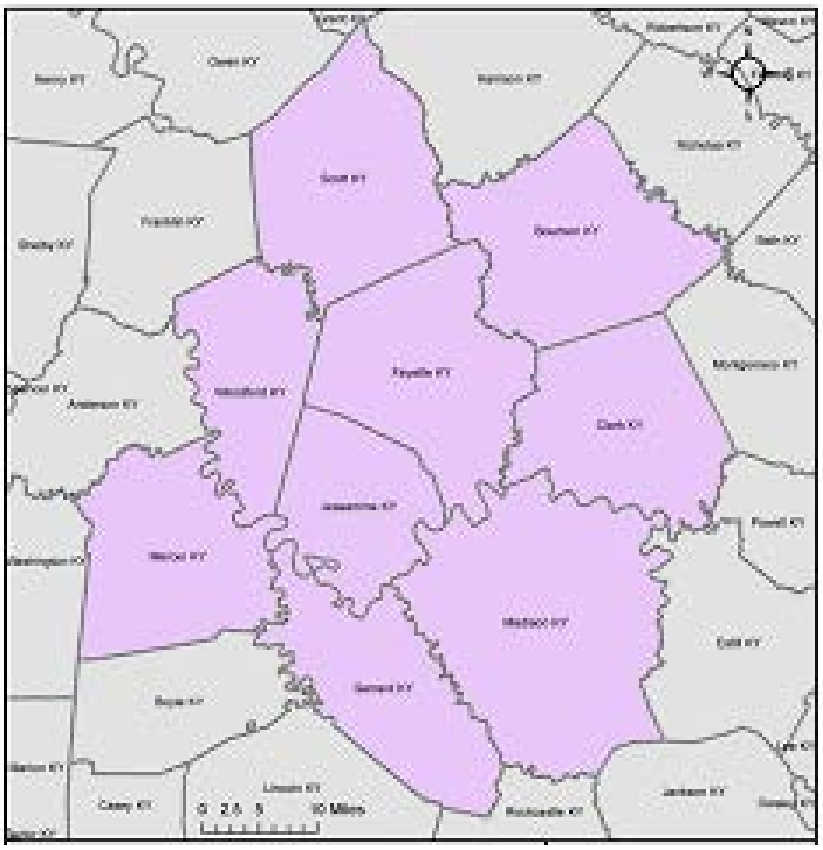


Exhibit 3.3 – Lexington Area MPO Travel Demand Model Area

The TDM was used to evaluate current and future population and employment density and growth areas. The model was also utilized to show current and future system capacity, flows and areas of congestion. The model provides system-wide performance measures for a base year (2017) given the existing roadway network and committed projects (E+C) which can be compared against a "no-build" and "build" alternative for the plan horizon year of 2045. The model also provides estimated system-wide transportation performance measures such as VMT and VHT should the MTP projects be completed (see Chapter 4.1.2 for more information).

## 3.4 Financial Forecasts

Under federal law, the 2045 MTP must be financially constrained. This requires demonstrating that the programs and projects in the MTP can be realistically implemented using revenue the MPO can reasonably expect to receive during the plan horizon. The MPO conducted a funding analysis in coordination with federal, state and local transportation agencies to estimate these future anticipated revenues. Since the MTP is a long-range plan, these anticipated revenues and expenditures are best estimates based on current and historical data available to the MPO. The actual cost and feasibility of implementing the entirety of the 2045 MTP will depend upon the future funding actions taken at the local, state and federal levels.

### 3.4.1 Revenue Sources

Major revenue sources at the local, state and federal levels that are utilized for transportation projects and programs include highway sources (Federal Highway Administration and Kentucky Transportation Cabinet), transit sources (Federal Transit Administration) and local funds.

#### Federal Funding

The largest funding source for roadway projects is the federal government. The Federal-Aid Highway Act and the Highway Revenue Act of 1956 established the Highway Trust Fund in order to create a financing mechanism for the Interstate Highway System. The Highway Trust Fund is the funding source for most of the programs in the Act. The funds come from a motor fuels tax and are administered by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). The FAST Act is the current transportation bill for the four year period from 2016 through 2020. This legislation includes several categories of funding, under which many of the projects in the 2045 MTP will be eligible for federal funding assistance. Major FAST Act programs that provide funding are:

- **Surface Transportation Block Grant Program (STBG)** - States and localities may use these funds for projects to preserve or improve the condition and performance of any Federal-aid highway. Eligible activities also include bridge projects on any public road, facilities for non-motorized transportation, transit capital projects, and public bus terminals and facilities. Note: This program replaces the former Surface Transportation Program (STP) and incorporates elements from the Transportation Alternatives Program (TAP).
- **Surface Transportation Block Grant Program Suballocation for Lexington (STBG-SLX)** – STBG funding dedicated to the Lexington area.
- **Surface Transportation Block Grant Program Set-Aside for Transportation Alternatives (STBG-TA) (formerly TAP)** –The FAST Act includes a set-aside of STBG funding for transportation alternatives. These set-aside funds include all projects and activities that were previously eligible under TAP, encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, Recreational Trails, Safe Routes to School projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.

- **National Highway Performance Program (NHPP)** - This program incorporates elements from several programs, including the National Highway System (NHS), Interstate Maintenance (IM) and Bridge programs.
- **Congestion Mitigation and Air Quality (CMAQ)** - A category of federal-aid highway funds that may be used only to support projects in air quality designated areas of Kentucky. Such projects must demonstrate an air quality improvement as a result of their use.
- **Highway Safety Improvement Program (HSIP)** - These funds must be used for safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem.
- Other minor funding sources include the Rail-Highway Crossings Program (RHCP), the National Highway Freight Program (NHFP), and an STBG set aside for off-system bridges.
- **Federal Transit Administration (FTA)**
  - ***Section 5303*** – Metropolitan Transportation Planning Program
  - ***Section 5307*** – Urbanized Area Formula Program
  - ***Section 5309*** – New Starts
  - ***Section 5310*** – Enhanced Mobility of Seniors and Individuals with Disabilities
  - ***Section 5311*** – Rural Areas Formula Program
  - ***Section 5339*** – Bus and Bus Facility Formula

## State Funding

Kentucky levies a motor fuels tax in addition to the federal tax to generate revenues for the administration and construction of transportation projects. State transportation funds are used for maintenance and operations of the statewide system, for the state construction program and to provide state match required to receive federal funding. State funds are also sub-allocated to local governments on a formula basis through the Municipal and County Aid Program and Rural Secondary Program. Local governments use these funds for maintenance, operations and for federal funding match.

- **State Construction Program (SP)** – construction, reconstruction and maintenance of state and county roads and bridges
- **State Construction Bonds Program (SPB)** – funding derived from bonding
- **State Construction High Priority Projects (SPP)** – funding available for construction and reconstruction of state and county roads and bridges

## Local Funding

In addition to the Rural Secondary, Municipal and County Aid Programs allocated to local governments by the state, local cities and counties may use their General Fund as a source of capital for operational and maintenance needs. Local jurisdictions provide local funding to match federal and state funds as well as to fund local transportation projects directly. Money for major capital investments in streets and highways may also come from the sale of bonds.

### 3.4.2 Highway Financial Estimate

The highway element of the financial plan is divided into a short-range and long-range forecast and financing plan to reflect two planning horizons covered within the 2045 MTP. The short-range forecast corresponds with the MPO's Transportation Improvement Program (TIP), a four-year funding and project programming document for the Lexington MPO Area (currently the Lexington Area MPO FY 2017-2020 TIP), and the Kentucky State Highway Plan, a six year programming document for projects statewide (currently the 2018 Kentucky State Highway Plan, covering years 2018-2024). The MTP's long-range funding forecast covers the remaining years up to 2045.

#### Short-Range Financial Plan: 2019 - 2025

The Kentucky State Highway Plan covers six fiscal years and is developed by the KYTC, approved by the Kentucky Legislature, and signed by the Governor. It is revised every two years to coincide with the even-year legislative sessions. The Kentucky Highway Plan uses project listings developed from MPOs, Area Development Districts and KYTC Highway Districts to develop a financial programming document to preserve and improve transportation facilities in the years covered by the plan. The Highway Plan and the MPO's Transportation Improvement Program (TIP) must be in agreement and fiscally-constrained. All MPO TIP projects must be accounted for in the MTP as well.

During the first seven years (2019 – 2025) of the 2045 MTP, it is assumed that all current projects in the 2018 Highway Plan will be completed (or have funding programmed), including through the year 2025 (in order to account for projects for which additional funding will be needed slightly beyond 2024). Therefore, the funding amounts shown for the 2019 – 2025 period of the MTP reflect the required costs to complete the projects currently in the KYTC Highway Plan. The estimated cost of implementing these short-range, committed highway projects in the 2045 MTP is $348,360,000. See Exhibit 4.2 and 4.3 in Chapter 4 for a list and map of committed highway projects.

#### Long-Range Financial Forecasts: 2026 – 2045

Revenue projections for the Lexington Area 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 to the Lexington Area.

##### *Statewide Funding Assumptions*

Based on an analysis of the current Kentucky Highway Plan and discussions with KYTC officials familiar with KYTC's financial projections, the assumed statewide annual base amount that will be made available for new projects selected through the KYTC's SHIFT process is $700,000,000. This is based on the $433,000,000 currently available for new projects, plus additional funding that is expected to be made available for new projects as the KYTC's backlog of bridge and pavement maintenance needs are addressed, adding $30,000,000 and $75,000,000, respectively, to the annual statewide base amount. Finally, it is also assumed that $162,000,000 in new funds will also be identified through the

Kentucky State Legislature to address a backlog of SHIFT projects (equivalent to 1/3 of the current unfunded needs).

### *Lexington Area MPO Funding Assumptions*

For years 2026 - 2045, revenue assumptions for the Lexington Area are based on an analysis of historical expenditures for highway improvement projects within the MPO area. Data for past expenditures of federal and state funding were available for the 25-year period from 1993 to 2017. There are two ways to look at historical spending: 1) the average total dollars spent annually in the MPO area and 2) the average percent of overall statewide funding that was made available for projects in the MPO area.

#### *Average Expenditure Amount*

Amounts spent on construction projects within the Lexington MPO area varied over this 25 year period from a low of $10,600,000 annually in 1993 to a high of $93,400,000 in 2008, with an average 25 year spending of slightly over $43 million annually. The observed variability and significant range in expenditures can be attributed to fluctuating construction activity and the costs of major projects. However, when these numbers are averaged over time, some stability can be expected. Recent years have shown larger expenditures than the 25 year average. The average amount expended for highway construction over the last 10 years is $57.8 million and $62.4 million over the last 5 years. However, the amount available statewide for capital projects is expected to fall as the state is currently addressing a critical backlog of bridge and pavement infrastructure repairs. Another factor affecting the funding of capital projects is toll credits. Toll credits, which are based on past levels of state investments in the federal highway system, permit KYTC the flexibility to use 100% federal funding on federal-aid projects. KYTC anticipates all of the available toll credits will be used by the end of FY 2020.

#### *Average Expenditure Percent*

The percentage of statewide funds that were expended annually on projects within the planning area (since 1993) fluctuated from a low of 1.33% to a high of 7.63%. However, over time averages have been relatively stable – 4.16% over the 25-year period; 4.22% over the last 10 years; and 4.10% over the last 5 years. For the future, it is assumed that increasing attention will be given to high-growth areas within the state and to areas with high levels of traffic congestion, and thus the percentage share for the Lexington MPO area should increase somewhat. Thus, the last 10-year average of statewide funding (rounded up to 4.3%) was assumed to be a reasonable estimate of future funding allocations to the Lexington area for the duration of the MTP 2026 – 2045 planning period.

Assuming 4.3% of the current statewide construction budget of approximately $700 million yields an estimated annual amount of $30 million (in current dollars). Added to this is $10 million in locally selected projects and locally controlled funds (SLX, TAP & CMAQ) providing a total of $40 million available annually for projects and programs in the Lexington MPO Area.

| Highway Revenue Estimate 2019 - 2045 | FY | Amount (2019 Dollars) |
|---|---|---|
| **Short Range (for committed projects)** | **2019 – 2025** | $348,360,000 |
| **Long Range (for new projects)** | **2026 – 2030** | $200,000,000 |
| | **2031 – 2035** | $200,000,000 |
| | **2036 – 2040** | $200,000,000 |
| | **2041 – 2045** | $200,000,000 |
| **Total** | | **$1,148,360,000** |

Exhibit 3.4 – MTP Highway Revenue Estimates for the Lexington Area MPO (2019 – 2045)

## Highway Financial Estimate (in Year of Expenditure Dollars)

As part of the financial analysis, federal regulations require that all project costs be shown in Year of Expenditure (YOE) dollars. In order to accomplish YOE, the Lexington Area MTP followed KY Transportation Cabinet guidance and used a 4% escalation per year for both costs and revenues.

The amounts in the table below reflect the long range revenue estimates (grouped in 5 year increments and adjusted for YOE as described above) Chapter 4 outlines how these anticipated funding revenues would be applied to capital projects and expenditures over the course the 2045 planning period.

| Highway Revenue Estimate 2019 - 2045 in Year of Expenditure Dollars | FY | Amount (2019 Dollars) | Amount (YOE Dollars) |
|---|---|---|---|
| **Short Range (for committed projects)** | **2019 – 2025** | $348,360,000 | $348,360,000 |
| **Long Range (for new projects)** | **2026 – 2030** | $200,000,000 | $285,100,440 |
| | **2031 – 2035** | $200,000,000 | $346,868,260 |
| | **2036 – 2040** | $200,000,000 | $422,018,300 |
| | **2041 – 2045** | $200,000,000 | $513,449,780 |
| **Total** | | **$1,148,360,000** | **$1,915,796,780** |

Exhibit 3.5 – MTP Highway Revenue Estimates for the Lexington Area MPO in Year of Expenditure Dollars (2019 – 2045)

### 3.4.3 Transit Financial Estimate

Prior iterations of the MPO's MTP and Long-Range Transit Plan as well as Fayette County's Comprehensive Plan encouraged increased transit services to manage growing travel demand within the Urban Service Area. The plans emphasized a need to ensure stable revenue sources to enhance mass transit and provide citizens with alternatives to personal vehicles as a means to reduce congestion on roadways, improve air quality, support businesses, employees and employers, and other community benefits.

Lextran's revenue comes from three primary sources: Formula allocations from the Federal Transit Administration (FTA); revenue generated from a local Fayette County property tax; and revenue generated from passenger fares. These funding sources account for an average annual budget of $27 million per year.

#### Transit Financial Estimate (in Year of Expenditure Dollars)

The MTP projections maintain this annual estimate over the 26 year period from FY 2019 through FY 2045 with a conservative 1% growth factor. These estimates only account for funding that is generally stable over time and does not include one-time or semi-regular infusions of funding from grants or special state/federal funding allocations for major capital projects. It also assumes fares do not increase and that formula funding remains consistent in the future.

| Estimated Transit Revenues (2019 – 2045) | | | |
|---|---|---|---|
| | **Funding Years** | **Revenue (2019 Dollars)** | **Revenue (Future)** |
| **Short Range** | **2019-2025** | $187,620,260 | $194,851,270 |
| **Long Range** | **2026 – 2030** | $134,014,470 | $143,150,828 |
| | **2031 – 2035** | $134,014,470 | $150,452,959 |
| | **2036 – 2040** | $134,014,470 | $158,127,572 |
| | **2041 – 2045** | $134,014,470 | $166,193,668 |
| | **Total** | $723,678,140 | $812,776,297 |

Exhibit 3.6 – Summary of Short and Long-Range Transit Revenue Estimates

### 3.4.4 System Maintenance & Operations

Effective operations and timely maintenance is a top priority to preserve transportation investments and maximize safety, efficiency and reliability. State, local and transit agencies each play a significant role in maintaining our roads, bike/pedestrian and transit facilities. They contribute resources including personnel, equipment, materials and associated funding to keep the system up and running on a day-to-day and long-term basis. These strategies fall under the broader category of Transportation System Operations & Maintenance (TSMO) which is discussed in section 4.4.3.

***State Agencies***

Routine maintenance of the State Road System is accomplished by KYTC. The agency commits funding to ongoing operations and maintenance programs in the Statewide Transportation Improvement Program (STIP). The KYTC is organized to provide operational and maintenance services in four key functional areas: roadway maintenance, bridge maintenance, rest area maintenance and traffic signal maintenance. The types of maintenance activities that funding is utilized for include:

- pavement maintenance
- guard rails and median cable barriers
- drainage channels, tunnels, retention basins, and sound walls
- maintenance and restoration of landscaping
- roadway lighting
- traffic signals
- signing and striping
- freeway management system support
- utility locating services
- encroachment permits
- crash clearing
- repair of damaged safety features
- litter pickup
- snow and ice removal

The estimated state/federal funding expenditures for maintenance functions in Fayette and Jessamine County is approximately $12 million annually.

***Local Agencies***

Lexington MPO member agencies (Lexington-Fayette Urban County Government, Cities of Nicholasville, Wilmore and Jessamine County) also work to maintain the transportation system. These agencies apply state and local funds and their share of state highway user revenue funds (municipal and county-aid funds) towards maintenance activities similar to those listed above. The goal of local funding is to supplement, not supplant federal-level and state revenues that KYTC dedicates to maintenance and preservation in the Lexington MPO area. Local agencies expend an average of $9 million dollars annually on operations and maintenance activities.

### *Transit Providers*

Maintenance is also a focus for regional transit and paratransit providers, with operating costs being the primary financial need for transit service, seconded by repairing vehicles and replacing them as needed. Lextran has estimated they will spend almost $27 million dollars annually to operate and maintain transit service, in today's dollars. Of this total, approximately 18% is used for routine maintenance with the remaining 82% allocated for other operating expenditures. Lextran has forecasted similar maintenance needs for the 26 year period of this MTP. Lextran reviews maintenance needs, operational efficiencies and related budgets every 5 years via a Comprehensive Operational Analysis (COA) of the transit system. The next COA is due in 2020 year and will assess public transit and funding needed to maintain an expanding transit fleet.

### *Summary of Maintenance & Operations Funding*

In order to preserve, protect and maintain the evolving transportation system, the MPO will continue to coordinate with local and state agencies as described and work to ensure adequate funding for maintenance and operational needs. The total expenditures, in 2019 dollars, for operational and maintenance activities estimated by these agencies are summarized in Exhibit 3.7 below.

| Maintenance & Operations Funding Estimates | | |
|---|---|---|
| **Major O & M Funding Sources** | **Annual** | **2019-2045** |
| State Funding (KYTC) | $12,000,000 | $324,000,000 |
| Local Funding | $9,000,000 | $243,000,000 |
| Lextran (Operations) | $22,140,000 | $597,780,000 |
| Lextran (Maintenance) | $4,860,000 | $131,220,000 |
| **Total** | **$48,000,000** | **$1,296,000,000** |

Exhibit 3.7 – System Maintenance Estimates
*Source: KYTC, LFUCG, Lextran*

## 3.5 Selecting Projects

The MPO worked to identify projects and strategies to address the region's transportation needs and evaluate solutions in a consistent and objective manner.

### 3.5.1 Project Sources

Projects evaluated by the MPO came from various sources. A prioritization tool, reflecting the region's Goals & Objectives, was used to help identify an order of priority for projects and future spending.

| Project Source | Description |
|---|---|
| **2040 MTP** | Projects identified in the 2040 Plan that were not implemented and remain relevant |
| **KYTC Continuous Highway Analysis Framework (CHAF) database** | Projects that have been proposed in the MPO area and are prioritized for possible inclusion in the KYTC State Highway Plan |
| **KYTC's District 7 Transportation Plan** | Projects from CHAF prioritized by the KYTC for possible inclusion in the KYTC State Highway Plan |
| **Local/Regional Plans** | Projects identified in Comprehensive Plans, Small Area Plans, Bicycle/Pedestrian Plan, etc. |
| **Corridor/transportation studies** | Projects from corridor studies/plans and traffic studies |
| **Congestion management process** | Projects identified through the MPO's congestion management process |
| **Input from staff, citizens and officials** | Projects and locations specified by local technical staff, citizen comments and local elected officials |

Exhibit 3.8 – Project Sources for MTP Consideration

### 3.5.2 Project Prioritization

To develop a financially-constrained transportation plan, the MPO had to prioritize which projects could be completed with estimated financial resources. The goal of the MPO's scoring process was to identify which projects would best facilitate the region's long term vision and to evaluate them in a consistent and systematic way. The scoring system was based on both federally-defined planning factors, locally-specific goals established by the MPO and nationally mandated transportation system performance measures. The numeric ranking helped indicate the project's ability to accomplish MTP goals, to achieve national performance goals and to provide a relative level of importance in relation to other projects. The process was intended to provide decision-makers with a basis of comparison and a recommended list of projects for the 2045 Plan.

### *Regional Goals*

The scoring criteria below are based on the 2045 MTP Goals and Objectives that were derived through public and stakeholder input. Each MTP goal was the basis for a project scoring category. Two additional scoring categories were added to address project feasibility (which relates to project delivery as set forth in national goals) as well a consideration of the anticipated benefit of the project in relation to project cost.

- **Safety** – crash rates and safety improvement strategies
- **Access/Choices** – enhancing more than one mode and providing access to low income, minority, disabled or elderly populations
- **Connectivity** – providing connections for road, bike, pedestrian users as well as regional connections; this includes providing redundancy to enhance transportation system security
- **Efficient, Reliable, Well Maintained** – addressing congestion through multimodal solutions, operational improvements or added capacity and enhancing system conditions
- **Economic Vitality** – supporting employment centers and freight movement
- **Community Character** – supporting quality growth through infill, redevelopment, streetscapes and mixed use development
- **Environment** – encouraging sustainable transportation solutions
- **Health and Wellness** – supporting physical activity and reduced vehicle emissions
- **Project History and Feasibility*** - this ninth factor was included in the scoring process to account for public and political support and for physical or financial constraints that would impact the likelihood of the project being implemented
- **Cost/Benefit* -** this tenth factor was added to add weight to the anticipated benefits of the project in relation to the project's cost

### *National Planning Factors*

The MPO also reviewed all federally required planning factors as outlined in current federal transportation legislation (FAST ACT) to ensure they were accounted for the scoring process. The planning factors set forth in federal regulations include:

- 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 accessibility and mobility of people and 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, for 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 and
- Enhance travel and tourism.

***National Performance Goals & Measures***

The MPO also incorporated federally mandated performance goals and measures into the project scoring tool as listed below.

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair
- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System
- **System Reliability** - To improve the efficiency of the surface transportation system;
- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment and
- **Reduced Project Delivery Delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process

For additional details on the project scoring tool and how it reflects and relates to the MPO's Regional Goals, the National Planning Factors and National Performance Measures see 4.6.

***Congestion Management Process***

Since the Lexington urban area has a population greater than 200,000, it is federally designated as a Transportation Management Area (TMA). In a TMA, the planning and programming process is required by federal regulations to consider urban congestion management and give priority to projects that relieve congestion. To ensure the prioritization tool was consistent with the MPO's Congestion Management Process (CMP), additional points were awarded to projects along congestion management routes based on current congestion levels. Points were also awarded to projects that applied a greater variety of congestion management strategies.

***Environmental Justice, Title VI & ADA***

Per federal law, MPOs must ensure equitable distribution of transportation services, facilities and resources within the community without regard to income, race, age, ability and other socio-economic factors; as well as avoiding any negative impacts or burdens on minority and low-income populations. The prioritization tool assigned additional points to projects that would serve disadvantaged populations and enhance the mobility of minorities, people in poverty, people with disabilities and

carless households. A map depicting where there are greater densities of disadvantaged populations in the MPO overlaid by the MTP projects is shown in Appendix E.

### 3.5.3 Project Scoping & Estimates

Each project location was reviewed to ensure the proposed project scope met the need and context of the surrounding area. For example, although traffic volumes may indicate a 4-lane roadway is needed in a residential area, a practical solution recognizes that is not a good fit and explores other options. Likewise, widening a right-of-way that is constrained by buildings, historic or environmental features may not be a practical solution to address long-term congestion issues, thus operational and multimodal improvements are identified as a preferred solution. With these constraints in mind, each improvement project was categorized as a major infrastructure project (often a major widening/capacity/multimodal upgrade project) or as a roadway modernization project (often geometrical and multimodal improvements).

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.

# Chapter 4 Our Priorities

Investments in a more sustainable transportation system that provides a diversity of transportation choices to each and every individual in the community is a foundational principle of the MTP. The 2045 MTP Goals and Objectives outline the Lexington Area MPO's commitment to providing a well-functioning, multimodal transportation system so that our region can continue to grow and thrive.

## 4.1 Complete Streets

A key policy to achieving an effective and equitable transportation system is commonly termed "Complete Streets." This concept is not new to the MPO Area, but is still in the process of being fully embraced and accomplished. Complete Streets strive to ensure all residents have equal access to employment, education, services and goods within our community regardless of age, income or ability. This includes seniors, children, people with disabilities as well as people who cannot, or choose not to drive. Complete Streets go beyond minimum Americans with Disabilities Act requirements to achieve best practices for accessibility for all people.

Complete street design practices result in right of ways that serve the mobility needs of everyone and contribute to community identity. A complete street generally has street-fronting land uses, slow travel speeds, and pedestrian-oriented design features. Placemaking is an important consideration in complete street design, where people, rather than vehicles are a main consideration so that streets provide a place for social interaction and improve the community's quality of life. **It is the intent for all projects undertaken in the MPO area to incorporate Complete Street design principles.**

## 4.2 Sustainable Transportation Investment

The MPO's 2045 MTP investment strategy is designed to address mobility and congestion management in more ways than one so that we can handle travel in a more context-sensitive, efficient and sustainable way than we do today. We recognize that a transportation system primarily geared toward automobile use leads to a number of individual, community and global consequences. Thus, the MPO and public have expressed a growing need to accommodate future travel differently than we have in the past. We recognize that personal auto use will continue to be a common mode of travel for many people. Our goal is to accommodate vehicular use as best we can, but not at the expense of making other transportation modes less desirable. We also want to reduce auto travel for some of our daily trips through more integrated land use patterns and to make travel by other modes safer and more convenient. To that end, the MPO has proposed a multipronged approach to transportation investment. First and foremost, we need to take care of our existing infrastructure, look to increase the efficiency of existing infrastructure through improved operations, to provide more and better

transportation choices, to be strategic in how and where we add system capacity, and when doing so, ensure that we improve travel capacity for all modes, not just personal vehicles.

Projects, programs and policies that the MPO has identified to improve mobility and reduce congestion generally fall within the following three broad project type/funding categories, which are discussed in detail in section 4.4:

- Major Infrastructure
- Modernization: Operational Improvements & Connectivity
- Mobility and Transportation System Management & Operations (TSMO)

Exhibit 4.1 below summarizes the type of projects that may be eligible for funding within these projects categories. The list is illustrative, rather than exhaustive. Funding allocation amounts and specific projects and initiatives are further described within this Chapter.

| **Major Infrastructure** | **Modernization: Operational Improvements & Connectivity** | **Mobility & TSMO** | | |
|---|---|---|---|---|
| | | **Transit Expansion/ Improvements** | **Operations & Management** | **Bicycle & Pedestrian** |
| Major Widening (add lanes) | Minor Widening | Increased peak-hour frequency | Turn Lanes & Access Management | Shared Use Paths (commuter-oriented) |
| Major Interchange Capacity | Geometrical Improvements | New/enhanced bus stops & transfer points | Intelligent Technology for Autonomous & Connected Vehicles | Sidewalks & On Road Bike Facilities |
| New Regional Roads & Connectors | Safety Improvements | Regional Commuter Services | Bottleneck Improvements | Intersection & crossing improvements |
| Adding Dedicated Transit Lanes (Bus Rapid Transit) | Turn Lanes/ Access Management | Technology Upgrades | Safety Hazards, ADA Deficiencies, Drainage Improvements | Education, Outreach & Marketing |
| Major Geometrical Upgrades on Rural Roads | Sidewalk, Bikeway & Transit Upgrades | Bus Rapid Transit implementation | Signal System Upgrades (hardware/software) & Adaptive Timing Plans | Pedestrian & transit-oriented land use planning & design guidelines |

Exhibit 4.1 – Eligible Project Types for Major MTP Funding Categories

## 4.3 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 and which capital improvement projects could be programmed over the 26-year planning period. Chapter 3 of the MTP describe the anticipated total revenues (based on past expenditures) in greater detail. This chapter addresses expenditures of those funds.

### 4.3.1 Short Range / Committed Project Financial Plan (2019-2025)

As noted in Chapter 3, highway and transit funding can be considered in terms of short-range (programmed projects) and long-range project planning. Projects within the MPO's Transportation Improvement Program (TIP) and the Kentucky State Highway Plan are considered short-range, committed projects. These documents identify and program funding to implement each phase of the listed projects in the coming 4 to 6 years. The current TIP covers FY 2017 – 2020 while the Kentucky State Highway Plan addresses 6 years (2018 – 2024). The 2045 MTP Short Range Financial Plan corresponds with these documents and covers the years 2019-2025. Exhibits 4.2 and 4.3 include a list of these committed projects, the funding that has been or will be programmed to complete those projects, and a project reference map. The total cost to implement these highway, bicycle/pedestrian and transit projects and programs from 2019 to 2025 is $585,752,000. More details on project phasing and funding can be found in the TIP at www.lexareampo.org and KY State Highway Plan.

## Short Range / Committed Project Financial Plan (2019-2025)

| Road & Intersection Projects | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| 1 | 7-3201.00 | LFUCG | KY 1681 | Old Frankfort Pike Scenic Byway Viewing Area at the intersection with Alexandria Dr. | $ 603 | $ 603 | | | | | | |
| 2 | 7-3718.00 | LFUCG | KY 1681 | Widening of EB and WB approaches of Manchester St. at the S. Forbes Rd. intersection to provide dedicated left turn lanes from Manchester St. to NB and | $ 893 | $ 893 | | | | | | |
| 3 | 7-3720.00 | LFUCG | CS 1257 | Widen both sides of Mercer Rd. along WB approach to Greendale Rd. intersection to provide separate left, right & through lanes. Includes sidewalks, | $ 978 | $ 978 | | | | | | |
| 4 | 7-8507.00 | LFUCG | CS 2548 | Polo Club Blvd complete construction at Deerhaven Lane and Todds Rd; Length=0.2 mi | $ 2,230 | $ 2,230 | | | | | | |
| 5 | 7-224.10 | LFUCG | CS 4174 | Clays Mill Rd widen from Harrodsburg Rd to New Circle Rd - Section 1; Length=2.0 mi | $ 12,850 | $ 12,850 | | | | | | |
| 6 | 7-87.50 | KYTC | New Road | East Nicholasville Bypass Section II from KY 39 to US 27 S of Nicholasville; Length=4.3 mi | $ 22,500 | $ 22,500 | | | | | | |
| 7 | 7-915.00 | KYTC | US 68 | Improve intersection of KY 29 North of Wilmore | $ 1,730 | $ 650 | $ 1,080 | | | | | |
| 8 | 7-8801.00 | KYTC | KY 4 | New Circle Rd sound barriers along outer loop between Tates Creek Rd and Nicholasville Rd; Length=1.2 mi | $ 2,300 | | $ 2,300 | | | | | |
| 9 | 7-8340.00 | KYTC | US 60 | US 60 (Winchester Rd) Scoping Study to reconstruct/widen to 4 lanes; Length=0.9 mi MP 12.5 - 13.4 | $ 280 | | | $ 280 | | | | |
| 10 | 7-9009.00 | KYTC | US 68 | Harrodsburg Road – Perform low cost safety improvements from Mercer County Line (MP 0.000) to NE of Clear Creek Road (MP 4.807). | $ 1,925 | $ 175 | | $ 1,750 | | | | |
| 11 | 7-8801.10 | KYTC | KY 4 | New Circle Rd sound barriers along outer loop between Tates Creek Rd and Nicholasville Rd; Length=1.2 mi | $ 2,300 | | | $ 2,300 | | | | |
| 12 | 7-366.02 | KYTC | KY 4 | Widen New Circle Road In Lexington From Georgetown Road To Boardwalk Avenue Including Interchange Reconstruction At Rw Newtown Pike. | $ 22,300 | | | $ 22,300 | | | | |
| 13 | 7-252.00 | KYTC | KY 922 | Newtown Pike six-lane from KY 4 to I-75; Length=1.8 mi | $ 42,300 | $ 5,000 | | $ 37,300 | | | | |
| 14 | 7-8909.00 | KYTC | I-75 | I-64/I-75 reduce congestion from southern split (MP 111.00) to the northern split (MP 117.67) (16CCN); length=6.7 mi | $ 30,000 | | | $ 5,000 | $ 25,000 | | | |
| 15 | 7-412.00 | KYTC | US 27 | L&N RR bridge overpass replace, improve drainage and typical section on North Broadway; Length=0.3 mi | $ 23,590 | | $ 10,000 | $ 1,550 | | $ 12,040 | | |
| 16 | 7-8902.00 | KYTC | KY 1927 | Liberty Rd extend the existing 4-lane on Liberty Rd from Graftons Mill Ln (MP 1.145) to New Circle Rd (MP 0.0) and improve intersection with New Circle Rd; | $ 14,820 | | | $ 4,300 | $ 1,730 | $ 2,600 | $ 6,190 | |
| 17 | 7-87.20 | KYTC | New Road | East Nicholasville Bypass Section 1A. South of KY 39 to North of KY 169; Length=4.3 mi | $ 15,600 | | | | | | $ 15,600 | |
| 18 | 7-414.00 | KYTC | KY 1980 | Brannon Rd improve geometrics, typical section, and roadway hazards from US 68 (Harrodsburg Rd) to US 27 (Nicholasville Rd); Length=3.2 mi | $ 24,500 | | $ 2,000 | $ 5,500 | | $ 5,000 | $ 12,000 | |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025)

## Road & Intersection Projects (Cont.)

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | 7-113.02 | KYTC | KY 4 | New Circle Road rehab and widening from Leestown Rd to near Georgetown Rd.; Length=3.4 mi | $ 39,650 | | | $ 4,300 | | | $ 35,350 | |
| 20 | 7-227.13 | KYTC | I-75 | I-75 SB Exit Ramp at Man O' War Blvd. – safety project to widen I-75 SB exit ramp at Man O' War to construct left turn lanes and install traffic signal | $ 550 | $ 550 | | | | | | |

## Transit

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | NA | LexTran | Transit | Lextran Operating Expenditures | $ 197,958 | $ 26,628 | $ 27,160 | $ 27,703 | $ 28,258 | $ 28,823 | $ 29,399 | $ 29,987 |
| 22 | NA | LexTran | Transit | Lextran Capital Expenditures | $ 35,472 | $ 5,020 | $ 5,272 | $ 5,324 | $ 5,378 | $ 4,778 | $ 4,826 | $ 4,874 |
| 23 | NA | LexTran | Transit | LexTran Elderly and Disability Transportation Services - Wheels | $ 917 | $ 131 | $ 131 | $ 131 | $ 131 | $ 131 | $ 131 | $ 131 |
| 24 | NA | LexTran | Transit | Purchase 2 40' electric buses and 2 charging stations | $ 1,736 | | $ 1,736 | | | | | |
| 25 | NA | BUS | Transit | Bluegrass Ultra-transit Service in Jessamine County expenditures (Fund Type 5311) | $ 1,239 | $ 177 | $ 177 | $ 177 | $ 177 | $ 177 | $ 177 | $ 177 |
| 26 | NA | BUS | Transit | Bluegrass Ultra-transit Service in Jessamine County expenditures | $ 70 | $ 10 | $ 10 | $ 10 | $ 10 | $ 10 | $ 10 | $ 10 |

## Bike/Ped

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 7-3220.00 | LFUCG | CS 4634 | Oxford Circle Sidewalks - Construct new sidewalks between Cambridge Drive and Versailles Road | $ 99 | $ 99 | | | | | | |
| 28 | NA | LFUCG | CS 3886 | Squires Road Sidewalks - Construct new sidewalks on the north side of the 200 block of Squires Road | $ 206 | $ 206 | | | | | | |
| 29 | NA | LFUCG | Various | Fayette County Elementary School Zone Enhancements | $ 340 | $ 340 | | | | | | |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025) (continued)

| Bike/Ped (Cont.) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| 30 | 7-3203.00 | LFUCG | CS 1376 | West Loudon Streetscape Improvements - Complete Sidewalk, Install Bike Lanes, Delineate Parking and Walkways along West Loudon Avenue From | $ 485 | $ 485 | | | | | | |
| 31 | 7-3224.00 | LFUCG | Trail | Town Branch Trail Phase III - Alex to Bizzell Dr. | $ 900 | $ 900 | | | | | | |
| 32 | 7-3713.00 | LFUCG | Trail | West Hickman Trail South - construct shared use trail within Veterans Park that will extend existing trail to elementary school; Length = 0.75 mi. | $ 951 | $ 951 | | | | | | |
| 33 | 7-3708.00 | LFUCG | Trail | Town Branch Trail Phase IV - Bizzell Dr. to Townley Shopping Center (New Circle Rd.) | $ 1,010 | $ 1,010 | | | | | | |
| 34 | 7-3714.00 | LFUCG | US 60 | Town Branch Commons - Midland Ave. section - Main St to Third St. | $ 2,577 | $ 2,577 | | | | | | |
| 35 | 7-3207.00 | LFUCG | US 25 | Town Branch Commons - Vine St. Section - Limestone to Quality St. | $ 3,119 | $ 3,119 | | | | | | |
| 36 | 7-3709.00 | LFUCG | Trail | Town Branch Trail Phase V - Townley Shopping Center (KY 4) to McConnell Springs Park. Length = 1.0 mi. | $ 5,100 | $ 5,100 | | | | | | |
| 37 | 7-3710.00 | LFUCG | Trail | Town Branch Trail Phase VI - McConnell Springs Park to Oliver Lewis Way | $ 5,900 | $ 5,900 | | | | | | |
| 38 | 7-3218.00 | LFUCG | Trail | Beaumont YMCA Trail and Crossing - construct trail connecting the Beaumont YMCA to Harrods Hill Park and surrounding neighborhoods; length=0.2 mi | $ 225 | | $ 225 | | | | | |
| 39 | 7-3219.00 | LFUCG | CS 4735 | Rosemont Garden Sidewalks - construct new sidewalks along three blocks just east of Southland Drive | $ 260 | | $ 260 | | | | | |
| 40 | 7-3221.00 | LFUCG | CS 2690 | Old Todds Road Sidewalks (Section 1) - construct new sidewalks along the north side of Old Todds Road between Catera Trace and Woodhill Drive | $ 371 | | $ 371 | | | | | |
| 41 | 7-229.20 | LFUCG | Trail | South Elkhorn Trail (Section 2) - Construct shared use trail from Joseph Bryan Way through NS RR tunnel to Waveland. Length=0.3 mi | $ 400 | | $ 400 | | | | | |
| 42 | 7-229.30 | LFUCG | Trail | South Elkhorn Trail (Section 3) - Construct shared use trail from Lochdale Terrace extending N under Man o' War Blvd to Shillito Park. Length=0.3 mi | $ 625 | | $ 625 | | | | | |
| 43 | 7-3223.00 | LFUCG | Trail | Citation Trail - construct shared use trail from existing bike lanes/sidewalk on Citation Blvd through Mable Ln Greenway continuing to Masterson Hills Park to | $ 710 | | $ 710 | | | | | |
| 44 | 7-3216.00 | LFUCG | CS 7038 | Wilson Downing Sidewalk Connections - construct new sidewalks to connect various sections of existing sidewalk. | $ 935 | | $ 935 | | | | | |
| 45 | NA | LFUCG | CS 1375 | Fourth Street Corridor Improvements - Includes curb and gutter, sidewalks, bike lanes, drainage, wayfinding and signage between Jefferson Street and Upper | $ 1,300 | | $ 1,300 | | | | | |
| 46 | 7-3215.00 | NICH | Trail | West High Trail - construct shared use trail along Wilmore Rd (KY 29) from Cooks Lane to Allie Run including realignment offset intersection and traffic and | $ 1,820 | | $ 1,820 | | | | | |
| 47 | 7-3717.00 | LFUCG | Trail | Brighton Rail Trail Bridge Phase IV - construct bridge and trail connections across Man O' War Blvd between Helmsdale Pl and Pink Pigeon Pkwy | $ 2,250 | | $ 2,250 | | | | | |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025) (continued)

## Bike/Ped (Cont.)

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 7-3103.00 | LFUCG | Trail | Legacy Trail Phase III | $ 2,400 | | $ 2,400 | | | | | |
| 49 | 7-3702.00 | LFUCG | KY 1681 | Town Branch Trail Crossing at Old Frankfort Pk and McConnell Springs Rd; includes ped signal, pavement markings, traffic calming, signage, and sight | $ 2,198 | | $ 2,198 | | | | | |
| 50 | 7-3213.00 | LFUCG | CS 3037 | Armstrong Mill Road Sidewalks - construct new sidewalks between Tates Creek Road and Greentree Road | $ 1,328 | | $ 152 | $ 1,176 | | | | |
| 51 | 7-3214.00 | NICH | Trail | East High Trail - construct shared use trail along West Maple St (KY 39) from Cental Ave to the proposed Eastern Bypass Trail; length=0.7 mi | $ 2,680 | | | $ 2,680 | | | | |
| 52 | | LFUCG | CS 3663 | Mt. Tabor Rd Multimodal Improvements Construction of sidewalks, bike lanes and associated infrastructure along Mt. Tabor Rd between Patchen Dr and the | $ 1,370 | | $ 1,370 | | | | | |

## Bridge

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | 7-1132.00 | KYTC | CS 3605 | Malabu Dr replace bridge over branch of Hickman Creek at Tates Creek Rd. Length = 0.1 mi | $ 427 | $ 427 | | | | | | |
| 54 | 7-1136.00 | KYTC | KY 39 | Address Deficiencies of Bridge over Hickman Creek at Black Bridge on KY 39 1.3 mi N of KY 1268. | $ 1,715 | $ 350 | $ 1,365 | | | | | |
| 55 | 7-1141.00 | KYTC | CR 1001 | Address Deficiencies of Bridge Over Branch of North Elkhorn Creek on Hume Road (CR 1001) 0.7 MI NW Of US 60 | $ 945 | $ 210 | $ 735 | | | | | |
| 56 | 7-1144.00 | KYTC | CR 1238 | Address Deficiencies of Bridge On CR 1238 (0.88) Over NS System. | $ 1,065 | $ 260 | $ 805 | | | | | |
| 57 | 7-8851.00 | KYTC | KY 169 | Address Deficiencies of Railroad Bridge on KY 169 (North 3rd Street Between Meadowlark Lane & Ilhardt Avenue | $ 1,500 | | $ 1,500 | | | | | |
| 58 | 7-10009.00 | KYTC | CR 1121 | Address Deficiencies of McCalls Mill Rd Bridge Over Boggs Fork | $ 518 | $ 158 | $ 361 | | | | | |
| 59 | 7-10011.00 | KYTC | KY 1768 | Address Deficiencies of KY 1268 Bridge over Hickman Creek | $ 1,540 | $ 308 | $ 1,232 | | | | | |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025) (continued)

## Pavement

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 7-20016.00 | KYTC | US 421 | Address Pavement Condition of AC Pavement | $ 550 | $ 550 | | | | | | |
| 61 | 7-20009.00 | KYTC | I-64 | Address pavement condition of I-64 cardinal direction(s) From milepoint 73.94 to milepoint 74.729 | $ 3,030 | $ 3,030 | | | | | | |
| 62 | 7-20015.00 | KYTC | I-75 | Address Pavement Condition of I-75 Both Direction(s) From MP 111.82 To MP 120.792 | $ 11,880 | | $ 11,880 | | | | | |
| 63 | 7-20013.00 | KYTC | I-75 | Address Pavement Condition of I-75 Both Direction(s) From MP 107.453 To MP 110.213 | $ 3,630 | | | $ 3,630 | | | | |
| 64 | 7-20011.00 | KYTC | I-64 | Address Pavement Condition of I-64 Both Direction(s) From MP 82.19 To MP 89.48 | $ 9,570 | | | $ 9,570 | | | | |
| 65 | 7-20025.00 | KYTC | US 25 | Address Pavement Condition On US 25 From MP 19.10 To MP 22.29 | $ 1,440 | | | | $ 1,440 | | | |
| 66 | 7-20014.00 | KYTC | I-75 | Address Pavement Condition of I-75 Both Direction(s) From MP 110.264 To MP 111.82 | $ 2,090 | | | | $ 2,090 | | | |

## Other

| MTP Project ID | Project ID | Sponsor | Route | Description | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67 | 7-357.17 | KYTC | Ferry | Operation of Valley View Ferry at Kentucky River | $ 1,710 | $ 330 | $ 330 | $ 330 | $ 180 | $ 180 | $ 180 | $ 180 |
| 68 | 7-227.00 | LFUCG | NA | Various Continuing Programs: Rideshare/Mobility (MB), Air Quality & Congestion Mgmt. (CM), Bike/Ped Planning (BP), Traffic Signal Upgrades | $ 5,292 | $ 756 | $ 756 | $ 756 | $ 756 | $ 756 | $ 756 | $ 756 |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025) (continued)

| Short Range Committed Financial Plan (2019 - 2025) - Summary | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project Type | Total Cost (x1000) | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
| **Road & Intersection:** | $ 261,899 | $ 46,429 | $ 15,380 | $ 84,580 | $ 26,730 | $ 19,640 | $ 69,140 | $ - |
| **Transit:** | $ 237,392 | $ 31,966 | $ 34,486 | $ 33,346 | $ 33,953 | $ 33,919 | $ 34,543 | $ 35,179 |
| **Bike/Ped:** | $ 39,559 | $ 20,687 | $ 15,016 | $ 3,856 | $ - | $ - | $ - | $ - |
| **Bridge:** | $ 7,710 | $ 1,713 | $ 5,998 | $ - | $ - | $ - | $ - | $ - |
| **Pavement:** | $ 32,190 | $ 3,580 | $ 11,880 | $ 13,200 | $ 3,530 | $ - | $ - | $ - |
| **Other:** | $ 7,002 | $ 1,086 | $ 1,086 | $ 1,086 | $ 936 | $ 936 | $ 936 | $ 936 |
| **Totals:** | $ 585,752 | $ 105,460 | $ 83,846 | $ 136,068 | $ 65,149 | $ 54,495 | $ 104,619 | $ 36,115 |

Exhibit 4.2 – Short Range / Committee Project Financial Plan (2019-2025) (continued)

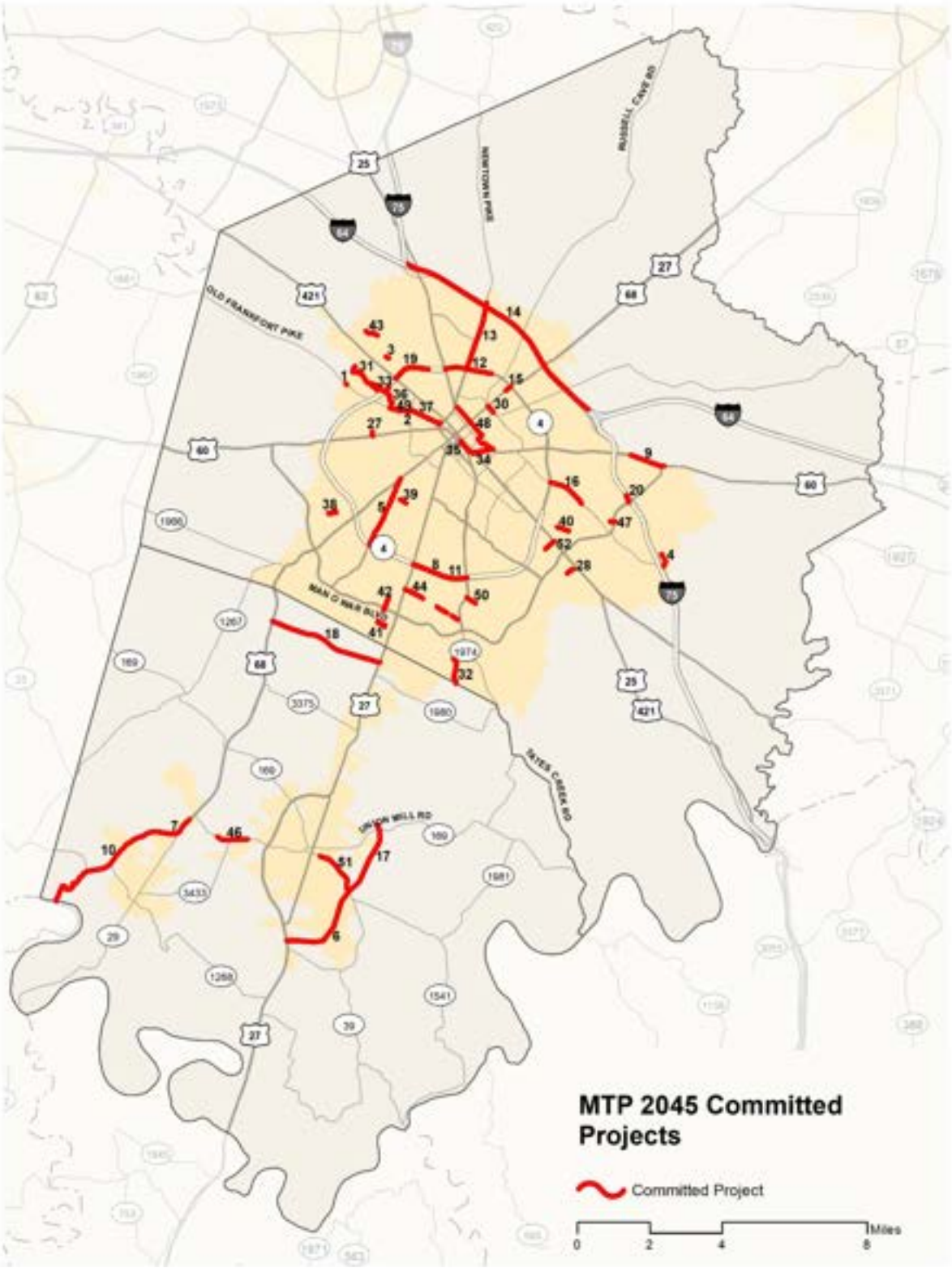



Exhibit 4.3 – Short Range / Committed Project Map (2019-2025)

### 4.3.2 Long Range Financial Plan

The MPO anticipates that approximately $800 million in current year dollars (see Chapter 3.4.1) will be available for new projects and programs in the Lexington MPO Area from 2026 to 2045. The chart below shows how the MPO plans to allocate this anticipated funding to transportation projects and programs over this 20 year time period.

It is important to note that these are long-range funding targets, not fixed amounts. Given the nature of transportation programming and projects, annual expenditures differ from year to year as projects of varying size and scope enter particular phases of implementation. For example, the construction phase of a project is much more costly than the design phase. Likewise, major infrastructure projects are more costly than operational upgrades. However, the intent is for expenditures to average these annual amounts and percentages over time. This would signal we are investing in a broad range of project types and improvements (multimodal upgrades, targeted capacity, technology and operational improvements).

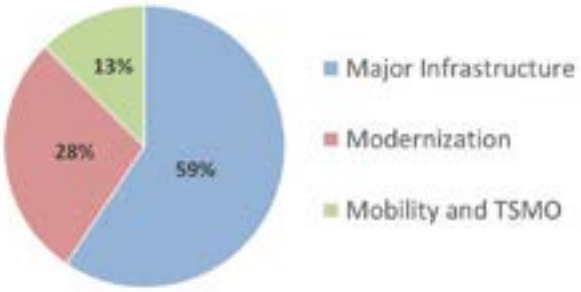



Exhibit 4.5 – Long Range Financial Plan: Allocation Targets by MTP Project Category (in today's dollar amounts)

| Project Category | % | 2026-2030 | 2031-2035 | 2036-2040 | 2041-2045 | TOTAL (2026-2045) |
|---|---|---|---|---|---|---|
| Major Infrastructure | 59% | $ 112,500,000 | $ 112,500,000 | $ 112,500,000 | $ 137,500,000 | $ 475,000,000 |
| Modernization | 28% | $ 62,500,000 | $ 62,500,000 | $ 62,500,000 | $ 37,500,000 | $ 225,000,000 |
| Mobility and TSMO | 13% | $ 25,000,000 | $ 25,000,000 | $ 25,000,000 | $ 25,000,000 | $ 100,000,000 |
| **Total:** | **100%** | **$ 200,000,000** | **$ 200,000,000** | **$ 200,000,000** | **$ 200,000,000** | **$ 800,000,000** |

Exhibit 4.5 – Long Range Financial Plan: Allocation Targets by MTP Project Category (in today's dollar amounts)

#### Long Range Project Selection

Chapter 3 describes the MPO's project ranking methodology. During that process, projects of similar scope and cost were grouped and compared against one another so that projects were competing against projects of a similar type. The highest scoring projects within each project category were generally scheduled in the nearer term of the long range plan with some exceptions made for special considerations such as significant public demand, MPO Policy Committee support and fiscal balance within each time band. Another consideration was logical sequencing such as avoiding parallel routes being under construction at the same time. Projects and programs in the third category (Mobility & TSMO) are not listed specifically in the 2045 MTP. Rather, they will be derived from various plans, such as small area plans, corridor plans, the MPO's Bicycle & Pedestrian Plan, special traffic studies, etc.

## 4.4 MTP Project Categories

Projects, programs and policies that the MPO has identified to improve mobility and reduce congestion have been grouped within the MTP into the following broad project categories:

- Major Infrastructure
- Modernization: Operational Improvements & Connectivity
- Mobility and Transportation System Management & Operations (TSMO)

The following sections provide an overview of each of these categories and the MPO's recommended project list and funding allocations. Related policies, programs and actions are also discussed.

### 4.4.1 Major Infrastructure Projects

As our community matures, opportunities to relieve congestion through major widening projects have become increasingly challenging and cost-prohibitive. Construction costs continue to rise and funding for large-scale transportation projects is more constrained, as are urban rights of way. Thus, our challenge is to maximize system performance through innovation and cost-effective measures and to be strategic regarding where and how new highway capacity is added.

We must regard capacity in terms of the transportation system's ability to move people, not just vehicles. Our corridors should be planned and designed to move the greatest number of people, including people traveling in cars, riding buses, traveling on foot or by bike. Thus, capacity improvements may include vehicular lanes, transit lanes, amenities that support accessible transit services, bicycle facilities, sidewalks and safe crossings.

The 2045 MTP recommends allocating 59 percent, or $475,000,000 (in today's dollars) of our anticipated future revenues toward Major Infrastructure projects which includes new or upgraded regional/cross-town roads, major widening of existing roads and associated complete street improvements. The recommended projects are mapped in Exhibit 4.8 and are listed by general timeframe in Exhibit 4.6.

Major infrastructure projects include interchange upgrades and addressing congestion along many of our major roadways that serve significant cross-town, regional travel and freight needs, including access to Interstate highways. Example projects in Lexington include Nicholasville Road, Man O War Boulevard, New Circle Road and Tates Creek Road in Lexington

Major Infrastructure projects in Jessamine County include the Nicholasville Eastern Bypass, Access Management project on US 27, and improvements to Keene Road (KY 169). One major Jessamine County project that is not included in the 2045 MTP, but was previously included in the 2040 MTP (albeit with potential "innovative" financing such as tolls) is the proposed I-75 Connector from the Eastern Nicholasville Bypass to I-75 in Madison County. There are a number of factors that led to the decision to remove it from the financially constrained 2045 MTP. First, it would be extremely

expensive to implement, even in comparison to other Major Infrastructure projects (project estimates were in the $150,000,000 range). Secondly, there are considerable environmental obstacles involved, particularly crossing the Kentucky River and Tates Creek Road. And third, support for the project is not as strong at both the local and state level given the significant reduction in available funding statewide and more pressing Jessamine County projects in need of completion. However, the project has not been removed from consideration altogether. In the years leading up to the next MTP update (MTP 2050) MPO staff will continue to work with stakeholders, KYTC planners and engineers to determine the best way to facilitate transportation demand between Jessamine County and I-75.

## Long Range Major Infrastructure Projects

| MTP ID | County | Route | Road Name | From/To | Project Description | Cost (Today $) | Programmed Construction Year | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2045 MTP - Major Infrastructure Projects** | | | | | | | 2021-2025* | 2026-2030 | 2031-2035 | 2036-2040 | 2041-2045 |
| 1 | Jessamine | | Nich. Eastern Bypass (I-B) | KY 169 to US 27x | Construct New Road | $38,000,000 | | $38,000,000 | | | |
| 2 | Fayette | US 25 | Georgetown Rd | Spurr Rd to south of Ironworks Pike | Modernize & Widen Roadway | $40,590,000 | | $40,590,000 | | | |
| 3 | Fayette | | Scott Street Connector | From Oliver Lewis Way to S Limestone | Construct New Road | $22,880,000 | | $22,880,000 | | | |
| 4 | Fayette | CS 4524 | Man O War Blvd | I-75 to Liberty Rd | Reduce Congestion / Multimodal Improvements | 9,760,000 | | 9,760,000 | | | |
| 5 | Fayette | KY 4 | New Circle Rd | Trade Center Dr to Woodhill | Reduce Congestion / Multimodal Improvements | $25,500,000 | | | $25,500,000 | | |
| 6 | Fayette | KY 4 | New Circle Rd | Boardwalk to N Limestone | Reduce Congestion / Multimodal Improvements | $18,750,000 | | | $18,750,000 | | |
| 7 | Fayette | KY 1974 | Tates Creek Rd | Malabu Dr to Armstrong Mill Rd | Reduce Congestion / Multimodal Improvements | $12,000,000 | | | $12,000,000 | | |
| 8 | Fayette | CS 4524 | Man O War Blvd | Liberty Rd to Richmond Rd | Reduce Congestion / Multimodal Improvements | $13,480,000 | | | $13,480,000 | | |
| 9 | Fay / Jess | US 27 | Nicholasville Rd | Man O War to Nicholasville Byp. | Reduce Congestion / Access Mgmt & Multimodal Improve. | $40,000,000 | | | $40,000,000 | | |
| 10 | Fayette | CS 4524 | Man O War Blvd | Winchester Rd to I-75 | Modernize / Widen Roadway / Multimodal Improvements | $10,750,000 | | | | $10,750,000 | |
| 11 | Jessamine | KY 169 | Keene Rd | US 68 to Keene Way Dr | Modernize Roadway / Multimodal Improvements | $22,000,000 | | | | $22,000,000 | |
| 12 | Fayette | CS 4524 | Man O War Blvd | Richmond Rd to Alumni Dr | Reduce Congestion / Multimodal Improvements | $10,970,000 | | | | $10,970,000 | |
| 13 | Fayette | KY 4 | New Circle Rd | Versailles Rd to Harrodsburg Rd | Major Widening | $37,250,000 | | | | $37,250,000 | |
| 14 | Fayette | KY 4 | New Circle Rd | Woodhill Dr to Alumni Dr | Major Widening | $30,000,000 | | | | $30,000,000 | |
| 15 | Fayette | KY 4 | New Circle Rd | Alumni Dr to Tates Creek Rd | Major Widening | $30,500,000 | | | | | $30,500,000 |
| 16 | Fayette | KY 4 | New Circle Rd | Harrodsburg Rd to Nicholasville Rd | Major Widening | $39,250,000 | | | | | $39,250,000 |
| 17 | Jessamine | KY 169 | Keene Rd | US 68 to 0.5 miles north of Clear Creek Rd | Modernize Roadway | $38,856,000 | | | | | $38,856,000 |
| 18 | Fayette | KY 4 | New Circle Rd | N Limestone to Eastland Pkwy | Reduce Congestion / Multimodal Improvements | $29,250,000 | | | | | $29,250,000 |
| | | | | | Total Programmed | $469,786,000 | | $111,230,000 | $109,730,000 | $110,970,000 | $137,856,000 |
| | | | | | Total Available | $475,000,000 | | $112,500,000 | $112,500,000 | $112,500,000 | $137,500,000 |

Exhibit 4.6 – Long Range Major Infrastructure Projects (2026-2030) in Today's Dollars

*see Committed Projects table (Exhibit 4.2) for 2021-2025 projects

### 4.4.2 Modernization: Operational Improvements & Connectivity Projects

The goal of Modernization projects is to make our transportation corridors work better through improved efficiency and to improve access and safety for people traveling in vehicles, on foot, by bike and by bus. The projects seek to improve operations to address bottlenecks at intersections and along congested, constrained right of ways. Operational improvements may include minor capacity additions (such as turn lanes) to improve traffic flow, including for busses and freight carriers. Solutions may also include intelligent technology, intersection upgrades, signal coordination, access management, sidewalks, streets crossings, and facilities to better accommodate transit riders and bicycle traffic. Projects may improve safety or upgrade bridge or drainage structures. Many will upgrade old rural cross-sections to urban cross-sections (providing curbs, gutters and sidewalks) within urbanized areas. Connectivity improvements include the completion of key collector / connector streets that will help to distribute traffic more evenly to reduce congestion on major arterials.

The MTP recommends allocating 28 percent, or $225,000,000 (in today's dollars), toward Modernization / Operational & Connectivity projects. The recommended project locations are shown in Exhibit 4.8 and listed by general timeframe in Exhibit 4.7. Most projects seek to improve operations along constrained roadways that carry significant amounts of regional traffic such as Winchester Road, Nicholasville Road, Versailles Road, etc. A number of projects are also proposed along cross-town connectors in need of multimodal facilities to improve connectivity such as Loudon Avenue, Liberty Road, Todds Road, Wilson Downing Road, Armstrong Mill and North Limestone in Fayette County as well as West Main Street in Wilmore and 3rd Street/Keene Road in Nicholasville.

## Long Range Modernization, Operational Improvements & Connectivity Projects

| MTP ID | County | Route | Road Name | From/To | Project Description | Cost (Today $) | Programmed Construction Year | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MTP 2045 - Modernization: Operational Improvements & Connectivity Projects** | | | | | | | 2021-2025 | 2026-2030 | 2031-2035 | 2036-2040 | 2041-2045 |
| 19 | Fayette | CS 2418 | Liberty Rd | New Circle Rd to Appletree Rd | Modernize Roadway / Multimodal Improvements | $7,040,000 | $7,040,000 | | | | |
| 20 | Fayette | CS 2495 | Mt Tabor | Patchen Dr to Richmond Rd | Modernize Roadway / Multimodal Improvements | $1,400,000 | $1,400,000 | | | | |
| 21 | Fayette | | Citation Blvd Extension | Winburn Rd extension to Russell Cave | Construct New Road | $3,350,000 | $3,350,000 | | | | |
| 22 | Fayette | | Fieldstone Connector | Beaumont Centre Parkway/Snaffle | Construct New Road | $400,000 | $400,000 | | | | |
| 23 | Fayette | CS 1001 | N Limestone | Withers Ave to New Circle Rd | Modernize Roadway / Multimodal Improvements | $5,940,000 | $5,940,000 | | | | |
| 24 | Fayette | US 60 | Versailles Rd (3A) | Mason Headley to Oxford Circle | Modernize Roadway / Multimodal Improvements | $1,520,000 | | $1,520,000 | | | |
| 25 | Fayette | US 60 | Versailles Rd (3B) | Oxford Circle to Red Mile | Modernize Roadway / Multimodal Improvements | $10,180,000 | | $10,180,000 | | | |
| 26 | Fayette | | Hamburg Connector | Polo Club to Sir Barton | Construct New Road (under I-75) | $4,880,000 | | $4,880,000 | | | |
| 27 | Fayette | US 27 | Nicholasville Rd | Cooper Dr to Brannon Rd | Bus rapid transit (Ph 1) - infrastructure | $10,000,000 | | $10,000,000 | | | |
| 28 | Fayette | US 27 | Nicholasville Rd | Cooper Dr to Southland Dr | Reduce Congestion / Multimodal Improvements | $4,600,000 | | $4,600,000 | | | |
| 29 | Fayette | CS 2418 | Liberty Rd | Appletree to Winchester Rd | Modernize Roadway / Multimodal Improvements | $1,200,000 | | $1,200,000 | | | |
| 30 | Fayette | US 60 | Winchester Rd | Midland Ave to New Circle Rd | Access Management / Multimodal Improvements | $2,700,000 | | $2,700,000 | | | |
| 31 | Fayette | CS 3037 | Armstrong Mill | Tates Creek to MOW | Modernize Roadway / Multimodal Improvements | $8,850,000 | | $8,850,000 | | | |
| 32 | Fayette | CS 2230 | Loudon Ave | Oakhill Dr to Bryan Ave | Modernize Roadway / Multimodal Improvements | $5,550,000 | | $5,550,000 | | | |
| 33 | Fayette | US 60 | Winchester Rd | Sir Barton to I-75 (eastbound) | Add Lane / Multimodal Improvements | $928,000 | | $928,000 | | | |
| 34 | Fayette | US 60 | Winchester Rd | I-75 to Patchen Wilkes Dr (westbound) | Add Lane / Multimodal Improvements | $2,235,000 | | $2,235,000 | | | |
| 35 | Jessamine | KY 29 | Wilmore Rd | Hoover Dr to Central Ave | Reduce Congestion / Modernize Roadway / Multimodal | $4,440,000 | | $4,440,000 | | | |
| 36 | Fayette | | Old Rosebud connector | Existing Old Rosebud to Liberty Rd | Construct New Road | $3,240,000 | | $3,240,000 | | | |
| 37 | Fayette | I 75 | I-75 | Winchester Rd to Man or War | Add Southbound Auxillary Ln | $1,387,000 | | $1,387,000 | | | |
| 38 | Fayette | CS 7038 | Wilson Downing | Belleau Wood to Tates Creek Road | Reduce Congestion / Multimodal Improvements | $2,040,000 | | | $2,040,000 | | |
| 39 | Fayette | CS 2690 | Old Todds Rd | Catera Trace to Palumbo | Modernize Roadway / Multimodal Improvements | $8,400,000 | | | $8,400,000 | | |
| 40 | Fayette | CS 2690 | Old Todds Rd | Palumbo to Liberty Rd | Modernize Roadway / Multimodal Improvements | $8,600,000 | | | $8,600,000 | | |
| 41 | Jessamine | KY 169 | KY 169 | Nich W Bypass to Oak Street | Modernize Roadway / Multimodal Improvements | $11,750,000 | | | $11,750,000 | | |
| 42 | Fayette | KY 1723 | Forbes Rd | Leestown Rd to Versailles Rd | Modernize Roadway / Multimodal Improvements | $4,330,000 | | | $4,330,000 | | |
| 43 | Fayette | CS 1321 | Russell Cave Rd | Loudon to New Circle Rd | Modernize Roadway / Multimodal Improvements | $5,000,000 | | | $5,000,000 | | |
| 44 | Jessamine | KY 29 | Wilmore Rd | Lone Oak to Hoover Dr | Intersection Safety / Multimodal Improvements | $4,780,000 | | | $4,780,000 | | |
| 45 | Fayette | US 60 | Versailles Rd (4) | Red Mile to Porter Place | Modernize Roadway / Multimodal Improvements | $3,540,000 | | | $3,540,000 | | |
| 46 | Fayette | US 60 | Versailles Rd (5) | Porter Pl to Oliver Lewis Way | Modernize Roadway / Multimodal Improvements | $3,780,000 | | | $3,780,000 | | |
| 47 | Fayette | | Twain Ridge Connector | Existing Twain Ridge to Harrodsburg Rd | Construct New Road | $4,160,000 | | | $4,160,000 | | |
| 48 | Jessamine | KY 1268 | Main St (Wilmore) | KY 29 to Kinlaw Dr | Modernize Roadway / Multimodal Improvements | $6,250,000 | | | $6,250,000 | | |
| 49 | Jessamine | US 27X | Main St (Nicholasville) | Richmond Ave (KY169) to US 27 Byp | Add Lane / Multimodal Improvements | $10,900,000 | | | | $10,900,000 | |
| 50 | Fayette | CS 1257 | Mercer Rd | Greendale to US 25 (Georgetown) | Modernize Roadway / Multimodal Improvements | $11,380,000 | | | | $11,380,000 | |
| 51 | Fayette | KY 1968 | Parkers Mill Rd | Lane Allen Rd to Man O War | Modernize Roadway / Multimodal Improvements | $8,550,000 | | | | $8,550,000 | |
| 52 | Fayette | KY 1968 | Parkers Mill Rd | Versailles Rd to Lane Allen Rd | Modernize Roadway / Multimodal Improvements | $11,660,000 | | | | $11,660,000 | |
| 53 | Fayette | KY 1978 | Greendale Rd | US 421 to Citation Blvd | Modernize Roadway / Multimodal Improvements | $7,250,000 | | | | $7,250,000 | |
| 54 | Fayette | CS 4174 | Clays Mill Road | KY 1980 to Twain Ridge | Modernize Roadway / Multimodal Improvements | $7,490,000 | | | | $7,490,000 | |
| 55 | Jessamine | KY 3433 | Jessamine Station Rd | RR overpass to Woodspointe Dr | Address Drainage / Multimodal Improvements | $1,500,000 | | | | $1,500,000 | |
| 56 | Fayette | US 421 | Leestown Rd | at Railroad underpass | Address Drainage | $2,500,000 | | | | $2,500,000 | |
| 57 | Jessamine | CS 4174 | Clays Mill Rd | Brannon Rd to Catnip Hill (KY 3375) | Construct New Road | $9,000,000 | | | | | $9,000,000 |
| 58 | Jessamine | CS 4174 | Clays Mill Rd | Catnip Hill (KY 3375) to KY 169 (Keene Rd) | Construct New Road | $9,000,000 | | | | | $9,000,000 |
| 59 | Fayette | KY 1977 | Spurr Rd | Georgetown Rd to Masterson Station | Modernize Roadway / Multimodal Improvements | $7,550,000 | | | | | $7,550,000 |
| 60 | Fayette | US 60 | Winchester Rd | Polo Club to Man O War | Modernize / Widen Roadway / Multimodal Improvements | $7,020,000 | | | | | $7,020,000 |
| 61 | Fayette | CS 1325 | Sandersville Rd | at Railraod underpass | Modernize Roadway / Multimodal Improvements | $7,220,000 | | | | | $7,220,000 |
| | | | | | **Total Programmed** | $243,490,000 | $18,130,000 | $61,710,000 | $62,630,000 | $61,230,000 | $39,790,000 |
| | | | | | **Total Available** | $243,000,000 | $18,000,000 | $62,500,000 | $62,500,000 | $62,500,000 | $37,500,000 |

Exhibit 4.7 – Long Range Modernization Projects in Today's Dollars

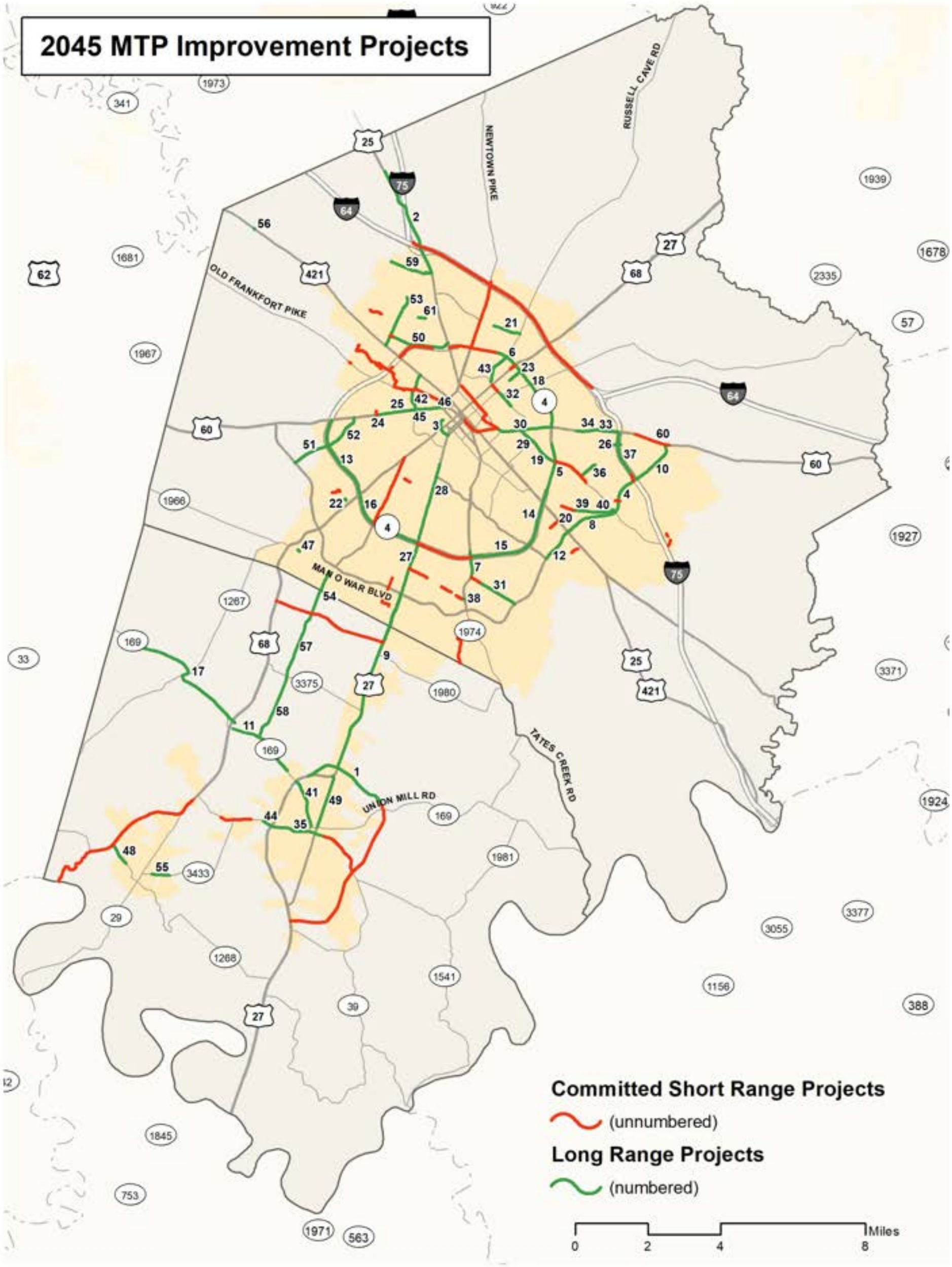



Exhibit 4.8 – Short Range/Committed Projects & Long Range Projects in Today's Dollars

### 4.4.3 Mobility and Transportation System Management & Operations

Mobility and Transportation System Management & Operations (TSMO) initiatives are strategies aimed at getting the most efficiency out of our transportation system, particularly during peak periods. Managing mobility involves efforts to relieve congestion by reducing the number of and length of single-occupant automobile trips. TSMO involves using technology to improve and maximize the efficiency and safety of the transportation system. A detailed discussion of these strategies can be found in the following "MTP Focus Area" sections.

The MTP recommends allocating 13 percent, or $100,000,000 (in today's dollars), toward Mobility & TSMO initiatives over the MTP planning period. Specific Mobility & TSMO projects are not listed in the 2045 MTP as they are typically lower in cost and are derived from various plans, such as small area plans, corridor plans, the MPO's Bicycle & Pedestrian Plan, special traffic studies, etc. These projects will be identified through coordination with transportation entities in the MPO area, including the Kentucky Transportation Cabinet and local traffic engineers, planners, the Congestion Management Committee and Lextran. These projects are generally of the "Grouped Project" type (see Appendix B) and may be approved by the MPO Policy Committee and added to the MTP and TIP by administrative modification. Amendments to the MTP and TIP may be undertaken, if necessary.

## 4.5 MTP Focus Areas

### 4.5.1 Transit Expansion/Improvements

Public transit is integral to a sustainable transportation system and Lexington area residents continue to demonstrate support for sustaining and expanding public transit. In 2004, residents voted to approve an annual property tax that creates a dedicated source of local funding for transit. With that, Lextran uses a data-driven process to guide how these transit resources are allocated. Lextran also conducts a Comprehensive Operational Analysis (COA), typically every 5 years, to evaluate the transit system and recommend the most cost effective steps to meet the needs of users. The last COA for Lextran was completed in 2015. In the years since then, Lextran has implemented many of the recommended changes to promote efficiency. This includes altering or cutting unproductive routes and shifting attention to areas of high need and potential ridership growth by increasing service frequencies or adding new routes in strategic areas.

A recent MPO survey explored the public's opinion on how to improve our transit system. At the top of the list was a desire for circulator routes in activity areas as well as more direct routes, reducing the need for transfers. Up-to-the-minute bus tracking technology ranked high as did improvements at bus stops. In 2018, a systematic inventory of bus stops along all transit routes was completed and will be used to prioritize and implement bus stop improvements. Additional desires include adding more routes, increasing bus service frequency, adding regional transit connections and increasing the hours of operation.

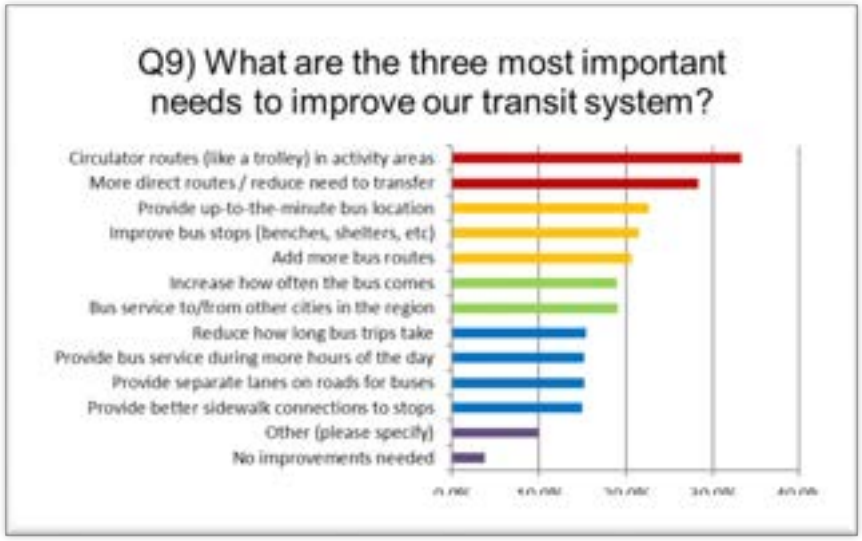



Exhibit 4.9 – MPO survey regarding transit (2018)

#### Regional Transit

Traditionally, Lextran service has only been available in Fayette County given more than two-thirds of transit funding is derived from the Fayette County property tax. Lextran has been open to providing service along commuter routes into Fayette County, but additional funding is needed for this service as well as minimum thresholds of ridership. Given just over 50% of workers in Fayette County live outside of the county, opportunities and strategies to achieve regional transit goals should be further explored. At present, several regional transit agencies do provide circulator routes within satellite communities as well as commuter routes into Fayette County, allowing riders to transfer to the

Lextran system at the downtown transit center. However, the frequency of service is limited as is ridership.

## Increased Service Frequency

The frequency of service can greatly influence whether someone will choose transit and Lextran has observed upticks in ridership when they are able to increase frequency. Near the University of Kentucky, route 14 runs every 7 – 10 minutes when UK is in session. Route 15 runs every 15 – 20 minutes during weekdays when UK is in session. Fifteen to 20 minute headways have been implemented on some high ridership routes such as Route 5 and parts of Versailles Rd routes 8 and 21. However, system-wide, there aren't enough resources to provide this level of frequency. Current weekday peak service along most routes includes 35-minute headways, with many routes operating 35-minute service throughout the day. Non-peak service on lower-volume routes and Saturday service operates at 70 minute headways. The MPO should continue to work with Lextran to explore ways to increase service frequency.

## Reduced Travel Times

Most all Lextran routes currently originate from and converge on the transit center in downtown Lexington, making it the main transfer point for a majority of routes. The radial "pulse" system makes it difficult to reduce point-to-point transit travel times. Since travel-time is a major factor when selecting travel mode, reducing transit travel times will be critical to enticing people to ride the bus rather than drive. Lextran is considering adding routes that make connections to other routes for curbside transfer opportunities. Strategic route connectors could bring about more efficiency in transit trips with the proper layout that would create shorter point-to-point trips that avoid the transit center layover. Another strategy to reduce travel times includes technology such as preemptive traffic signal coordination for buses and queue jumper lanes.

Photo Source: *www.kentucky.com*

## Operational & Administrative Facility

Lextran recently completed a new administration building located on West Loudon Ave. This new facility allowed Lextran to consolidate and streamline administrative and maintenance functions. The facility includes a Compressed Natural Gas (CNG) fueling station. There are currently 12 CNG busses in use at Lextran and the new facility is near capacity for CNG fueling and maintenance. Lextran plans to add more CNG vehicles into the fleet as soon as possible and this will require upgrading CNG capacity at the facility, including a compressor, backup generator, and various maintenance shop upgrades. These upgrades are slated to be completed in the next 2 years.

## Bus Rapid Transit

In January of 2014, Lextran completed a Transit Alternatives Analysis for the (U.S. 27) Nicholasville Rd corridor. After a study of existing conditions, forecasted demographics, future land uses and traffic patterns, it was recommended to pursue a Locally Preferred Alternative (LPA) of Mixed Traffic Bus Rapid Transit (BRT) connecting Nicholasville with downtown Lexington. This proposed version of Bus Rapid Transit envisions a limited amount of inbound and outbound stops with service running form a terminal park-and-ride location in Nicholasville to the downtown transit center in Lexington. The service would consist of nine new stations along the corridor and the existing transit center. The BRT line would operate with approximately one mile station spacing from 6 AM to 6 PM on 20 minute weekday headways. Ridership estimates using the STOPS model predict 1,700 riders on an average weekday. When college students and special event trips are accounted for, the number is estimated to increase to 2,100 per weekday. Travel time savings for the service are 9.6 minutes for the inbound trip and 6.2 minutes for the outbound trip. The service would be branded differently in relation to the regular fixed-route buses to identify it as a special service including iconic stations and various amenities. The areas where the BRT stops are installed will present an opportunity for creative redevelopment, bike, pedestrian and transit-oriented design. Customized treatments along travel corridors will be implemented to allow the bus to mitigate traffic more efficiently during peak congestion. Three main elements of the chosen Locally Preferred Alternative are as follows:

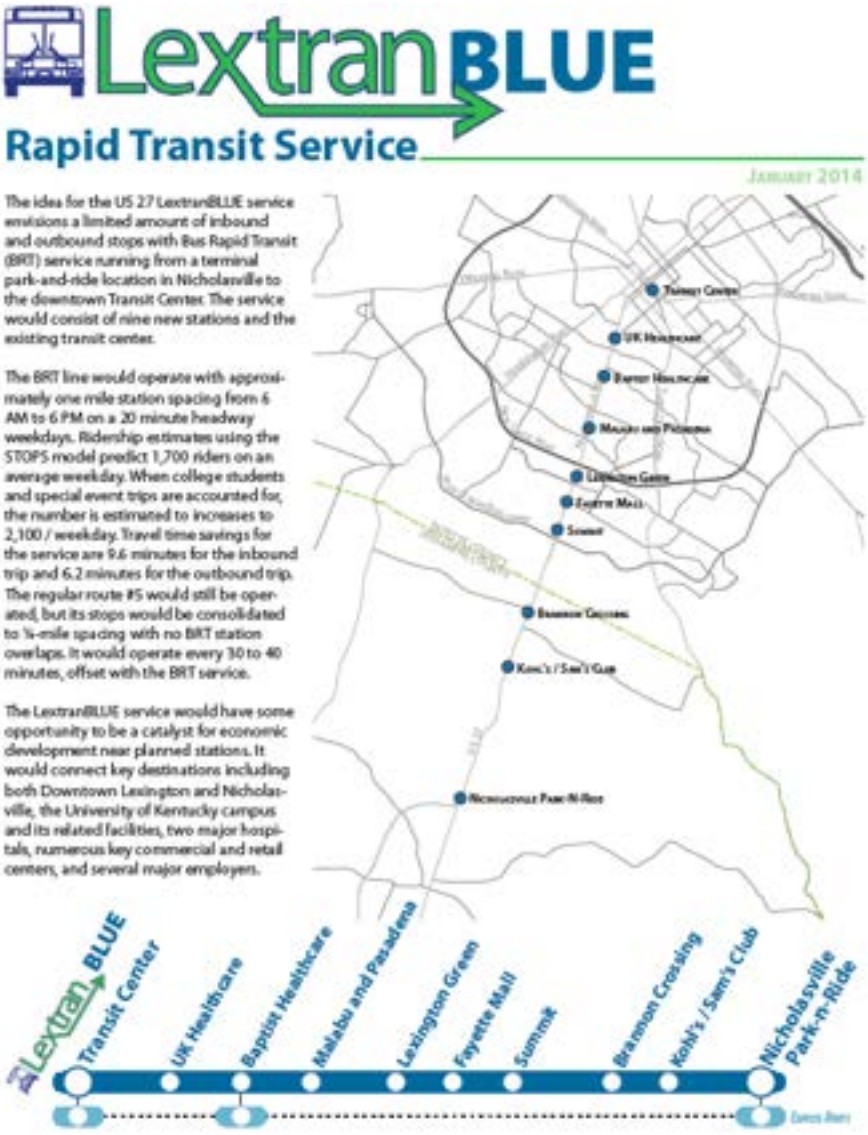
**Business Access Transit Lane** – Where exclusive BRT lanes are not feasible, existing curbside lanes would be designated as a Business Access-Transit Lane, or a "BAT Lane." This would take advantage of the curb lane that most through traffic typically avoids because of frequent right turn entrance activity. BAT Lanes are designated primarily through signage that restricts their use to only buses and vehicles making right turns.

**Transit Signal Priority** – Through the use of GPS technology, Transit Signal Priority (TSP) provides a time savings advantage to BRT buses with minimal impact on overall traffic flows. TSP allows buses to receive an early and/or additional green phase indicator at the traffic signal to improve on-time performance if the bus is running late. TSP involves equipping BRT vehicles with special emitters that send speed, heading, and position information. If the vehicle is approaching while the signal is green, the controller provides for additional green time to get the vehicle through the intersection.

**Queue Jump Lanes** – These lanes take TSP a step further by providing a short stretch of exclusive lane as a BRT bus approaches an intersection. Queue jump lanes can be located at key intersections, allowing the BRT bus to receive a green signal while other vehicles remain at a stop at the same intersection, thus giving the bus priority in the queue.

**Focus on US 27 Corridor -**The Nicholasville Rd corridor is of critical importance for moving people and goods in the MPO area, and also presents significant peak-hour congestion challenges which added vehicular capacity will not solve. The MPO has programed this corridor for a comprehensive corridor study in partnership with the city of Lexington to begin in 2019. This study will explore the best opportunities for transit oriented development along the corridor, including increasing residential

density, improving walkability and other needed infrastructure improvements to support bus rapid transit.



Furthermore, Jessamine County and the City of Nicholasville have invested in a U.S. 27 Access Management Plan, which establishes agreements for preserving the integrity of the roadway corridor for future multimodal improvements, including possible future transit service, as well preserving the integrity of basic traffic operations as development continues in the Jessamine County portion of the corridor.

## Transit Financial Plan

Exhibit 4.10 presents LexTran's financial plan given current and anticipated Year of Expenditure (YOE) revenue and expenditures. The chart assumes no service changes for the purposes of forecasting the cost to continue the current service into the future. This financial information will be updated if and when additional service needs, costs, revenues and expenditures are identified. It should be noted that while forecasted expenditures exceed anticipated revenue, Lextran will either pursue additional revenue through various grant opportunities or make necessary expenditure reductions will be made.

**Transit Financial Plan: Summary of Short & Long Range Revenue & Expenditures 2019-2045 (x $1,000) in Current Year Dollars**

| | | Revenue | | | | Expenditures | | |
|---|---|---|---|---|---|---|---|---|
| Funding Source: | | Federal | Local Tax | Fares | Total | Operating | Capital | Total |
| Short Range | 2019-2025 | $ 36,537 | $ 125,563 | $ 33,496,974 | $ 33,659,073 | $ 186,394 | $ 35,140 | $ 221,534 |
| Long Range | 2026-2030 | $ 26,098 | $ 89,688 | $ 23,926,410 | $ 24,042,195 | $ 133,139 | $ 25,100 | $ 158,239 |
| | 2031-2035 | $ 26,098 | $ 89,688 | $ 23,926,410 | $ 24,042,195 | $ 133,139 | $ 25,100 | $ 158,239 |
| | 2036-2040 | $ 26,098 | $ 89,688 | $ 23,926,410 | $ 24,042,195 | $ 133,139 | $ 25,100 | $ 158,239 |
| | 2041-2045 | $ 26,098 | $ 89,688 | $ 23,926,410 | $ 24,042,195 | $ 133,139 | $ 25,100 | $ 158,239 |
| Total | | $ 140,928 | $ 484,313 | $ 129,202,614 | $ 129,827,854 | $ 718,948 | $ 135,540 | $ 854,488 |

**Transit Financial Plan: Summary of Short & Long Range Revenue & Expenditures 2019-2045 (x $1,000) in YOE = 1%**

| | | Revenue | | | | Expenditures | | |
|---|---|---|---|---|---|---|---|---|
| Funding Source: | | Federal | Local Tax | Fares | Total | Operating | Capital | Total |
| Short Range | 2019-2025 | $ 33,123 | $ 129,393 | $ 26,299 | $ 188,815 | $ 197,958 | $ 35,472 | $ 233,430 |
| Long Range | 2026-2030 | $ 25,112 | $ 98,100 | $ 19,939 | $ 143,151 | $ 159,175 | $ 25,112 | $ 184,288 |
| | 2031-2035 | $ 26,393 | $ 103,104 | $ 20,956 | $ 150,453 | $ 175,742 | $ 26,393 | $ 202,136 |
| | 2036-2040 | $ 27,740 | $ 108,363 | $ 22,025 | $ 158,128 | $ 194,034 | $ 27,740 | $ 221,773 |
| | 2041-2045 | $ 29,155 | $ 113,891 | $ 23,149 | $ 166,194 | $ 214,229 | $ 29,155 | $ 243,384 |
| Total | | $ 141,523 | $ 552,851 | $ 112,368 | $ 806,741 | $ 941,138 | $ 143,872 | $ 1,085,011 |

Exhibit 4.10 – Transit Financial Plan: Summary of Short and Long Range Revenue and Expenditures 2019-2045 (x $1,000) in Current Year Dollars and Year of Expenditure (YOE = 1%)

### 4.5.2 Travel Demand Management Strategies

Travel demand management (TDM) programs are a cost-effective way to reduce congestion and the need for additional vehicular capacity. TDM efforts aim to reduce the number and length of personal trips made in private automobiles, particularly during peak travel times. TDM can be accomplished by providing public transit, bicycle and pedestrian facilities and increasing their use; through better coordinated land use and transportation planning; and low-cost strategies aimed at travel behavior modification. TDM strategies may include:

- Increasing bicycling, walking and public transit use
- peak-hour and regional commuter services (public and private)
- employer services & strategies (coworker carpool matching, telework, flexible hours, etc)
- marketing campaigns
- vanpool services
- carpooling ridesharing programs
- car-sharing services
- parking management strategies
- telecommuting & variable work schedules
- guaranteed ride home programs
- financial incentives
- land use/corridor plans
- transit-oriented development
- development incentives/requirements

TDM services and programs available in the Lexington area have varied over time. Moving forward, the MPO should work to review and assess past and current programs and initiatives. The MPO should engage partner agencies and stakeholders, including the public, to develop strategies for improving existing programs and employing new TDM strategies that appeal to residents and workers in today's region. It is anticipated that MTP funding earmarked for Mobility & TSMO projects and programs will help support these initiatives.

### 4.5.3 Planning, Land Use & Urban Design

The demand for travel and how realistic and desirable our travel options are is directly related to land use patterns and the design of our public and private places, spaces and streets. The intensity and location of land uses influences travel patterns. Dispersed land development and disconnected street patterns tends to result in more vehicular travel. Rates of bicycling, walking and public transit are higher where land uses are more compact, mixed and connected. When schools, parks and shops are located close to homes, residents do not have to travel far for their daily needs. Walking and bicycling is more convenient and they are less likely to drive for every trip. Even when trips are made by vehicles, they are shorter, reducing the total amount of vehicular travel on the system.

A primary purpose of urbanization and transportation systems is to facilitate the movement and exchange of goods, services, ideas and relationships among people. How a person will choose to travel is influenced by many factors including how much time they have, how long it will take them, how direct their route is, how safe their route is, and how desirable and interesting it is. Reducing automobile travel requires planners and designers to be strategic and mindful of these factors and to consider how the built environment will shape people's travel choices. People will not walk or bike if their route is indirect, lacks sidewalks and involves crossing multi-lane roads with fast moving traffic. Taking the bus can be equally frustrating if it takes twice as long as driving, if bus stops are located too far away and if there are no sidewalks leading to stops.

The design of buildings, parks, plazas, open spaces and streets also impacts travel choice as does the relationship of buildings to the street. Closely-spaced buildings oriented toward the sidewalk increases the desirability of walking as do pedestrian-oriented store fronts, tree-line streets and active civic spaces. These not only increase walking, but they contribute to community character and livability. Thus, if we want to succeed in creating more desirable communities and ones where automobiles do not dictate our community form and character, we must be deliberate in our planning and design efforts. This requires absolute integration of land use and transportation planning. Many MPOs support planning initiatives and studies that will help local jurisdictions incorporate community design standards and guidelines into their planning processes. They may also target transportation investment in areas that are working to better integrate land use and transportation including neighborhood, pedestrian and transit-oriented developments and corridors. The Lexington Area MPO should continue to support, lead and participate in these efforts in Fayette and Jessamine County. It is intended that funding allocated toward Mobility & TSMO programs may be utilized for initiatives such as:

- Land use planning including small area plans and corridor plans
- Commercial and residential design standards/guidelines
- Street design standards/guidelines
- Transit-oriented and pedestrian-oriented design guidelines
- Street connectivity and access management standards

In 2019, the MPO will undertake the first such corridor study & land use plan in coordination with the LFUCG Division of Planning along the US 27 Nicholasville Road Corridor. The goal of the study is to couple planned infrastructure investments with land use policies to incentivize infill, increase residential densities and apply community design approaches that will improve walkability, mixed uses and density to make bus rapid transit more viable.

### 4.5.4 Bicycle & Pedestrian Projects & Initiatives

A major goal of the 2045 MTP is to accelerate implementation of the MPO's Regional Bicycle & Pedestrian Master Plan (BPMP) that was adopted as an element of the prior 2040 MTP in early 2018. The BPMP outlines community goals for bicycling and walking, formulated through public input, and includes a list of proposed policies and improvement projects to create a more walkable and bike friendly community. The plan describes the role that bicycling and walking play in creating a more livable and sustainable region. It emphasizes the nexus between a healthy and active citizenry and investments in active transportation as an opportunity to decrease future healthcare costs and to produce social, economic and public health returns on these investments. Several major and continued focus areas of the 2018 Bicycle and Pedestrian Master Plan include:

*Bicycle, Walking & Urban Design*

The BPMP recommends that development and design standards continue to be revised to result in more walkable and bike friendly neighborhoods. Beginning after the adoption of the 2035 MTP, the Bicycle and Pedestrian Coordinator was made a permanent staff position in the Lexington Area MPO. The Coordinator serves on Lexington's Technical (development) Committee, the Planning Commission's Subdivision Committee and regularly reviews and advises the planning staff and the Planning Commission on new development and infill redevelopment to ensure projects include adequate bike, pedestrian and transit infrastructure. Significant progress was also made to develop Complete Street standards for new developments that relate roadway design to land use and improve the context-sensitivity of roadway corridors. A number of bicycle and pedestrian-related standards have also been incorporated into the zoning ordinance, particularly for mixed use, big box, infill and adaptive reuse developments. Moving forward, continued emphasis should be placed on incorporating bicycle & pedestrian-friendly elements into planning and zoning codes in both Fayette and Jessamine County.

*Complete Streets*

The BPMP and previous 2040 MTP also called for developing a more balanced transportation system by refocusing transportation projects and planning efforts on creating "Complete Streets" that are designed with the needs of pedestrian, bicyclists, motorists and transit users in mind. A draft "Complete Streets" manual for Fayette County has since been developed to serve as a design guide for all public capital roadway projects and roads built by private developers in new/infill developments. The manual advocates developments with connected streets and stipulates context-sensitive street designs. This includes facilities for bicyclists and pedestrians that are responsive to traffic volumes and speeds and ensuring intersections are designed to be bike/walk friendly, minimizing the "barrier effect" that major roadways create for bicyclists and pedestrians. The MPO should seek formal adoption of the Complete Streets Manual by LFUCG and should work with Jessamine County to incorporate complete street standards into their local codes, standards and regulations.

The BPMP identifies a network of streets that are currently bike/walk friendly and also prioritizes projects along streets that are in need of retrofits. Some bike/ped network improvements will require major roadway improvements and these needs are incorporated into the MTP's Major Infrastructure and Modernization projects. The impetus and increased priority of these projects was significantly influenced by bicycle and pedestrian safety needs. As a result, nearly all projects within the MTP contain specific improvements for bicycling, walking and public transit (excluding projects on limited access highways). The 2045 MTP further intends that the funds earmarked for Mobility & TSMO projects be utilized by the MPO to implement priority stand-alone bicycle and pedestrian projects that are needed along streets not otherwise slated for improvement as part of Major Infrastructure or Modernization projects.

## *Greenway Trails*

The BPMP emphasized the development of off-road greenway trails as a component of the bicycle and pedestrian transportation system. The plan identified priority north-south and east-west trails both within and between the two counties of the MPO. In Fayette County, the Legacy Trail and Veterans Park Trail (including the Bellefonte & West Hickman Trail) are the primary north-south connections. Significant sections of this trail corridor have been constructed over the past five years including the 2 mile extension of Legacy Trail into the Kentucky Horse Park, several bikeways in the vicinity of downtown and the University of Kentucky, as well as trails in Veterans Park. The West Hickman Trail connection to the Jessamine County line is currently under construction and should be completed by early summer. This trail will serve as one of the southern regional connections into Jessamine County along the Brannon Road Corridor.


The Town Branch Trail (to the west) and the Brighton East Rail Trail (to the east) are the primary east-west Fayette County connections and have also seen significant progress over the last five years including the design and funding of the Town Branch Trail Phases 4, 5 and 6. These phases are scheduled to be completed by 2020 and will connect to the Town Branch Commons. The Town Branch Commons is fully funded and will connect the downtown core through a series of urban greenways between Rupp Arena and the Isaac Murphy Memorial Art Garden (at the corner of Third Street and Midland Ave). The Commons intersect with numerous trails and bicycle facilities along the way including the Legacy Trail and connections to the University of Kentucky and Transylvania University. The completion of these projects will produce more than 35 miles of fully connected trails providing access to housing, jobs, education as well as goods and services.

The Brighton East Rail Trail on the east side of Lexington also has a fully funded connection to the Liberty Park Trail (near Star Shoot Blvd) via a bicycle and pedestrian bridge over Man o War. The bridge will connect 1000's of residents in the Hamburg area to schools, jobs, shopping and dining without the

hassle of sitting in traffic. The Liberty Trail will continue adjacent to the Liberty Road Corridor connecting to Winchester Rd/Midland Ave and the Town Branch Commons. The KYTC's Liberty Road Project will incorporate the next phase of the trail and is currently in design.

In Jessamine County, a major north-south trail connection has been constructed along US 68 with plans to extend it through the Wilmore/KY 29 "Y" intersection project, then beyond into downtown Wilmore, thus connecting the existing US68 Trail into Wilmore. A shared use trail is under construction along the US27 Eastern By-pass that will also connect to the East-West School Connector project planned along the US29/US39 corridor. These are among the first of 6 major projects identified in a 2015 study. The projects will improve bicycle and pedestrian safety and connect 90% of Jessamine County Public Schools. Two phases have been designed and the East High School Project is in the process of securing funding for construction. The completion of the project along the corridor will provide local and regional connections to Wilmore and Lexington.

In northern Jessamine County, the West Brannon Road project will include a shared use trail connecting US68 to US 27. The remainder of Brannon Rd to the east will connect to the West Hickman Trail terminus at the Fayette County Line. This will complete a multi-county regional network through the heart of the Bluegrass connecting the Kentucky Horse Park to the north to Wilmore in the south and winding through urbanized areas in Fayette and Jessamine County along the way. It is the intent of the 2045 MTP that funds earmarked for Mobility & TSMO projects be utilized by the MPO to implement priority greenway trail projects.

### *Evaluation*

Methods for evaluating progress on improving the region for bicycling and walking are outlined in both the BPMP and the "Plan Evaluation" section of the MTP. These include collecting data on bicycling and walking usage, collision rates and tracking the impact that facility mileage has on these rates. While some data is available on work-related bicycle and pedestrian trips through the US Census, trip data for all other purposes is unknown and does not account for a significant number of trips for other purposes including for school, exercise, social outings, shopping and general errands. It is recommended that the MPO work to collect more bike/walk usage data. Methods may include scheduled counts, smart phone and other GPS technologies, shared mobility vehicle data and traffic signal actuation counts. The counts will provide information that can be used to generate more accurate data including collision rates, as opposed to monitoring only the number of collisions. GPS data can also provide insight on the routes people currently take for bicycle and pedestrian trips. This data can be used to determine the best approach to completing the gaps in the bicycle and pedestrian network. They will also provide another means for prioritizing projects listed in the BPMP and the MTP.

### 4.5.5 Operations & Management

It is essential to get the most out of our existing and future transportation infrastructure. To this end, the 2045 MTP supports ongoing and expanded system operations & management. The MPO also supports the strategic use of intelligent transportation systems to maximize system capacity and to delay or eliminate the need for more costly improvements.


Causes of congestion can often be addressed with operational strategies that directly target problem areas. Regional operational strategies geared toward optimizing system performance may include expanding regional Intelligent Transportation Systems including incident management systems & coordination, signal coordination and special event traffic management. These strategies improve mobility, access to information for travelers, reduce traveler delays, and enhance public safety and security. A discussion of initiatives underway in the Lexington Area follows:

***Intelligent Transportation Systems (ITS)***

Intelligent Transportation Systems (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 periods. ITS elements, which fall under the broad category of TSMO strategies, can include:

- Vehicle detection devices that report traffic counts, speed and travel time;
- Video surveillance equipment that monitors roadways for congestion and incidents;
- Roadway sensors that monitor weather and road conditions;
- Communication services and facilities that transmit information;
- Traffic control centers that serve as central location for traffic management, communication, and collection and coordination of information;
- Variable message signs that display traffic information to motorists;
- Roadway service patrols that respond to incidents in a timely manner.

***ITS Architecture***

ITS programs work most effectively when integrated into an interconnected network or architecture. ITS Architecture is "A regional framework for ensuring institutional agreement and technical integration for implementation of ITS projects." ITS Architecture creates a common framework of interoperability at the national, regional or local level and helps ensure that ITS deployments:

- can be planned in a logical manner;
- integrate successfully with other systems;
- meet the desired performance levels;
- has the desired behavior;
- is easy to manage;
- is easy to maintain;

- is easy to extend;
- satisfies the expectations of the users.

### *Lexington Area ITS Architecture*

In 2015, the ITS Architecture was developed for the Lexington MPO area to provide a roadmap for the deployment and integration of transportation systems in the region over a 10 year period (2015-2025). The architecture was developed through a cooperative effort by the transportation, transit, law enforcement, emergency management, commercial vehicle and freight management agencies. It represents a shared vision of how each agency's systems work together by sharing information and resources to enhance transportation safety, efficiency, capacity, mobility, reliability, and security. More information is at https://lexareampo.org/its/index.htm.

### *Traffic Management Programs*

Ongoing traffic signal system upgrades, including equipment and timing plans and other innovative high tech adaptive monitoring, detection and control systems are essential to maximize system efficiency and safety.

### *LFUCG Traffic Management Center*

Lexington's Traffic Management Center (TMC) is the nerve center for helping the public have a safe and efficient journey to and from their homes and other destinations. The TMC allows traffic conditions to be monitored and for engineers to identify problem areas and to make signal adjustments in real-time. In order to better serve the public, LFUCG has recently added two new services: Traffic Ticker, an up-to-the-minute reporter of traffic tie-ups and street closings and Live Traffic Cameras, which enables citizens to view high definition traffic cameras located around the city. These services are available at: https://www.lexingtonky.gov/departments/traffic-engineering.


### *Real-Time Public Transit Information and Automatic Fare Collection*

Lextran has acquired and implemented technology that monitors buses in use with global positioning satellites (GPS). The technology allows Lextran to monitor performance and offer real-time information to passengers on the timing of bus service. Automatic fare collection and accounting systems have also been implemented to save time and money for both Lextran and their passengers.

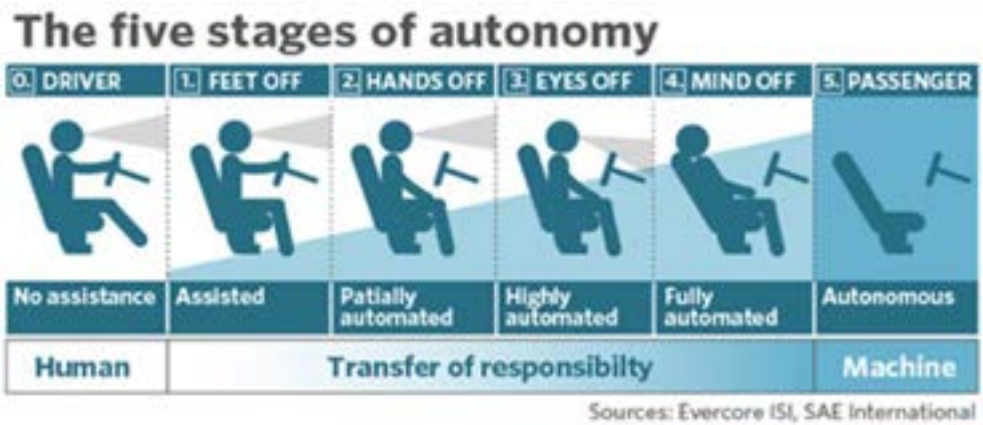
### *Traffic Incident Management*

Traffic incidents, such as crashes, stalled vehicles, traffic stops, roadway debris, construction and special events, are estimated to cause 55 percent of the total delay experienced by motorists in the United States. Traffic congestion caused by these incidents affects the safety and mobility of all travelers. Traffic incident management works to reduce the effects of incident-related congestion by detecting incidents when they occur, reducing the time for responders to arrive, and decreasing the time required for traffic to return to normal conditions. Many public sector and private sector partners are involved in traffic incident management, but it is not a core function of any agency. The Lexington Area MPO transportation planning process has a Technical Coordinating Committee that meets regularly to discuss multiple matters, including the coordination of incident management strategies. The 2045 MTP encourages jurisdictional and private sector partners to continue to enhance this program and improve coordination among the many entities involved, including first responders and police.


### *Autonomous & Connected Vehicle Technology*

Autonomous vehicles (AVs) and connected vehicles (CVs) are among the most heavily researched emerging transportation technologies. It is widely accepted that AVs and CVs will present both benefits and challenges for private companies, individuals and the government sector. But the timing and pace of their deployment by manufacturers and their acceptance by the public is uncertain.

Connected vehicles will most likely come first. CVs will communicate with the vehicle's driver, with other cars on the road (vehicle to vehicle - V2V), with roadside infrastructure (V2I) and with the "Cloud" (V2C). Autonomous vehicles are classified by their level of automation and are expected to be deployed in stages:



Safety and transportation system efficiency gains are expected through AV/CV implementation and through reduced collisions (94% of serious crashes are due to human error and congestion is closely tied to crash-related incidents). The following benefits are also expected:

- Crash Reduction/Elimination
- Reduced Need for New Infrastructure
- Improved Travel Time Dependability (or reliability)
- Improved Productivity (less time spent in traffic)
- Improved Energy Efficiency (less time spent idling)
- Improved Transportation Access /New Models for Vehicle Ownership

Challenges will also occur. These may include issues with security/privacy, data sharing/analytics, lagging technological infrastructure and the staggered pace of acceptance and integration at the local, regional and national level. Moving into the future will require adaptability and fresh thinking by local governments who will play four key roles: 1 – Strategist, 2- Operator, 3 – Convener/Catalyst, and 4- Regulator. In order to achieve the best results and outcomes, the MPO will need to monitor, collaborate and invest responsively to best prepare for and support this inevitable change.

### 4.5.6 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:

- 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 and to identify safety problems, needs and solutions;
- Pursuing available funding to correct safety deficiencies;
- Marketing, public education and safety outreach efforts;
- Engaging with public safety agencies and coordinating incident management plans.

***Safety***

MPO projects, programs and processes must be consistent with and work to achieve the mission, vision and goals of the Kentucky Transportation Cabinet's Strategic Highway Safety Plan (SHSP) entitled "Toward ZERO Deaths." To this end, the MPO staff evaluates the area's collisions utilizing the state's Highway Performance Monitoring System (HPMS) and collision/crash databases. The MPO also reviews monthly collision data for Fayette County that is provided by the LFUCG Division of Police and incorporates this information into the transportation planning process. Focus areas of the analyses include high frequency:

- Between Street Collisions
- Intersection Collisions
- Red Light Running Collisions
- Pedestrian Collisions
- Bicycle Collisions

The MPO staff also frequently assesses safety-related data with Geographic Information Systems (GIS) which are visualization tools that can illustrate problem areas. Examples include overlaying vehicular collisions with congestion-related data and analyzing bicycle and pedestrian crashes in relation to the presence of a sidewalks or bikeways.

The MPO also seeks to improve safety by using Complete Street design principles for projects that are implemented through the MTP. Such design strategies that are known to improve safety for all travel modes include:

- Ensure vehicular speeds are appropriate for the surrounding area and expected road users.
- Minimize high vehicular speeds and speed differentials between modes.
- "Target" vehicular speeds should be equivalent to roadway "design" speeds – these criteria influence roadway geometric features - and thus vehicular speeds - including horizontal and vertical curvature, lane widths and turning radii.
- Set appropriate speed limits.
- Use physical measures such as curb extensions and medians to narrow the traveled way;

- Set signal timing for slow to moderate progressive speeds between intersections;
- Use narrower travel lanes that cause motorists to naturally slow; and
- Use design elements such as on street parking or street trees to create side friction.

### *Security*

Transportation security deals with emergency events such as natural disasters, terrorist attacks or other incidents caused by criminal activity that can significantly impact our transportation system. Such events often require a coordinated response from multiple stakeholders. The Lexington Area MPO Transportation Planning process facilitates coordination with the area's public safety agencies that deal directly with these issues and concerns through several committees and groups:

- Transportation Technical Coordinating Committee (TTCC)
- KYTC District 7/MPO Project Coordinating Committee
- Blue Grass Area Development District Regional Transportation Advisory Committee

One objective of the MPO is to help ensure cooperation and coordination among agencies that are involved in incident management and responding to emergency situations. In the event of a major hazard, measures may be taken to ensure an area or site is safe and secure and may necessitate roadway closures. Opening closed highways or lanes as soon as possible is desirable. In some events, evacuations may be necessary. Police, Fire, and Emergency Management agencies maintain current evacuation and disaster preparedness plans. The link to LFUCG's Division of Emergency Management is www.BEREADYlexington.com.

Another objective of the MPO is to ensure that the transportation system is capable of handling a response to an emergency. This can be achieved by assessing the transportation system and ensuring that, in the case of highway closures, there is redundancy in the system meaning there is good connectivity and parallel alternative routes. Providing sufficient emergency personnel and good access for emergency equipment along transportation corridors is also important when time is of the essence to those in distress and those who wish to continue on to their destinations. Utilizing existing and future planned ITS systems and other measures can help aid in accessing and clearing emergency incidents and can also be effective for handling evacuations.

In the past, the Lexington Area MPO and the FHWA conducted a security self-assessment to comply with FHWA's security-related directives. The findings and recommendations from that assessment have all since been implemented.

The following are continued security objectives and actions recommended by the 2045 MTP:

- Continue to ensure cooperation and coordination among all agencies in incident management and emergency situations.
- Continue to engage emergency and law enforcement personnel in transportation planning.
- Continue assessments to ensure that the transportation system is capable of handling a response to an emergency.

- Continue to coordinate with the Transportation Technical Coordinating Committee, which includes members of KYTC, LFUCG, local governmental officials, law enforcement, and emergency personnel.
- Conduct an updated security self-assessment as needed to determine new security needs as they relate to the transportation planning process.

## 4.5.7 Freight

Freight concerns largely relate to mobility and access. Mobility for freight means smooth and reliable traffic flow conditions on the region's state and federally-designated truck network which includes interstates, freeways, major regional and principal arterials, and at-grade railroad freight crossings.


Exhibit 4.11 – Kentucky Designated National Truck Network

The majority of freight movement in the LAMPO region occurs on the highways. Freight accessibility in the MPO area generally pertains to the freight vehicle operator's ability to locate, navigate to, and reach the intended destination within the truck network to deliver and/or pick up freight. Access issues include road geometrics, bridge clearances, weight restrictions and severe bottlenecks between regional roadways and the manufacturers and freight facilities located in Fayette and Jessamine Counties.

The roadway improvement projects identified in the 2045 MTP will benefit the movement of freight. In the project scoring and selection process, projects that will positively impact freight corridors as well as locations where freight originates and arrives in substantial amounts, were given additional weight. Lexington's Travel Demand Model also accounts for and evaluates truck trip generation rates. These rates were adapted from the Quick Response Freight Manual II. The LAMPO model forecasts truck traffic for two types of heavy trucks: Single units (which contain FHWA vehicle classes 4-7) and combinations (which contain FHWA vehicle classes 5-13).

In order to meet regional goals for economic activity and freight movements, the Lexington Area MPO identified the following focus areas needed for successful freight transportation.

***Freight Coordination***

Freight providers tend to be very knowledgeable about bottlenecks in the system that can hinder truck and other vehicle movements. In addition, they may be aware of signal timing, signage or geometric (e.g., turning radii) deficiencies in the system. With their involvement, the MPO can develop a detailed list of improvement needs and incorporate them into project designs and operational, maintenance, and management initiatives. While long-range freight planning is necessary, short-term results are also important in engaging and maintaining interest from freight providers.

The MPO will work with freight transportation companies operating in the region to identify specific deficiencies in the transportation system that hinders freight movements and to incorporate design elements for large trucks in roadway planning and design along major freight corridors. In addition, coordination with KYTC on freight issues could provide increased information regarding freight flows and improvement needs. It may be desirable to establish a freight task force for this purpose.

### *Land Use Considerations*

To the extent possible, heavy truck traffic should be separated from light vehicle traffic and sensitive land uses (e.g., neighborhoods, schools, parks, etc.). Heavy industrial land uses should be isolated from residential and commercial areas, or their truck routes carefully planned and adhered to. The MPO actively engages with the LFUCG Long Range Planning Section and Comprehensive Plan update process to make every effort to ensure freight issues are considered in land use decision-making.

### *Roadway Design and Access Management*

Due to their large size, trucks and buses have special needs for moving through the transportation system. Roadway and access requirements for these vehicles should be considered in the design of intersections and interchanges. Roads in and around industrial areas should be designed to accommodate the movement of large trucks to the maximum extent possible, while also considering impacts to other roadway users (including bicyclists and pedestrians). The MPO must continue to work with local and state engineering departments to ensure freight considerations are included in design standards.

### *Designated Truck Routes*

Truck routes provide freight haulers with a network of the most efficient and least impacting locations for traveling through Fayette and Jessamine County. Designated truck routes can have a positive influence on traffic safety if properly planned, implemented and enforced. Hazardous materials traffic should be carefully considered and routed accordingly. These designated routes will be updated periodically, especially as land use changes and roadway improvements occur.

### *Commodity Survey and Freight Study*

Since the last study is out of date, the Lexington Area MPO will work to update the commodity and freight study as funding and resources are available.

### 4.5.8 Maintenance

All elements of our transportation system require maintenance and the residents of our community want our system maintained in a state of good repair. This requires systematic, routine maintenance including sweeping streets, cleaning and repairing drains, and fixing traffic signals. It also requires significant investments in rehabilitating and repaving surfaces, replacing substandard bridges, reconfiguring and upgrading intersections. Unfortunately, regular and preventative maintenance can be deferred when funding is too limited which leads to a backlog of needs, safety hazards and higher long-term costs.

#### Right of Way Components

Right of way components in need of maintenance including curb ramps, sidewalks, signs, signals, pavement markings, street trees and drainage structures, among others. Many jurisdictions and agencies oversee the maintenance of various facilities within the right of way; even private property owners are responsible for certain elements such as sidewalks, street trees and curbs. Ultimately, local and state governments are responsible for enforcing these requirements and ensuring public facilities are kept in a state of good and safe repair.

Good coordination is essential to effective maintenance practices and to realizing any cost savings and economies of scale that performing maintenance functions in sync can provide. For instance, there are financial and time-saving benefits to repairing drainage structures and realigning or repairing curb ramps when roads are resurfaced; however, budgeting and planning for these improvements are not always aligned. In recent years, the MPO has participated in LFUCG's weekly paving meetings (held during resurfacing season). These meetings engage local maintenance crews, engineers and traffic engineers as well as the paving contractors completing the work. The group reviews and discusses scheduled paving projects and potential improvements to be completed incidental to the work. This may include subgrade corrections to address recurrent pavement failures, drainage improvements, curb ramps, pedestrian crossing improvements, the addition of bike lanes, road diets, new or revised striping plans/markings and travel lane reconfigurations to improve traffic flow, installing signal detection loops and others enhancements.

#### Pavement Preservation

Studies by the Texas Transportation Institute indicate that it costs less in the long run to have good roads than bad roads. Deferred maintenance drives up long-term cost and accelerates the need for complete roadway rehabilitation, which can be four times as costly. Deferred rehabilitation also compounds the problem, often leading to pavement failure and the need to reconstruct the whole roadbed, at what could be 10 times the cost.

As illustrated in the figure, for each $1 spent before pavement quality drops below "fair" condition later saves from $6 to $14 dollars in major rehabilitation work. While this example is for road pavement, it is applicable to nearly any public infrastructure or asset including transit fleet vehicles and shelters.


## Transit Maintenance

Maintaining the region's bus system is essential to provide safe and efficient service to thousands of daily riders and for attracting new ridership. Maintenance needs include regularly servicing vehicles and the systematic replacement of aging fleets as well as keeping transit stations, bus stop and shelters clean and in a state of good repair. The MPO anticipates that on-going maintenance and operations for existing services will be supported through FTA formula funds and the local property tax funds dedicated to transit.

### 4.5.9 Environment

The 2045 MTP supports an improved environment for the Lexington area in several ways. The Plan promotes projects that modernize transportation infrastructure and programs that reduce emissions, including those that were identified in the LFUCG's Empower Lexington Plan. These initiatives cover a broad array of strategies to reduce emissions:

- Develop bike and pedestrian programs and infrastructure;
- Increase transit service and coverage;
- Promote ridesharing;
- Develop an eco-driving program;
- Pursue energy efficient highway and congestion relief strategies;
- Encourage low carbon and alternative fuels;
- Promote energy efficient vehicles;
- Pursue smart streetlights.

Examples of initiatives addressed within the MTP include adding more bike and pedestrian facilities to encourage non-motorized travel, purchase of clean fuel buses and fleets, intelligent transportation operations systems for our highways, and transportation demand management programs to reduce congestion and delays.

In addition, the Plan supports continued efforts to promote energy efficient planning. The MTP emphasizes strategies to achieve long-range goals for transit oriented development, infill and redevelopment and the livability principles (more choices, supporting existing communities, and valuing neighborhoods). These efforts will not only reduce pollution in the area but also promote a more active population where walking, biking and transit-riding are seen as true alternatives to vehicle travel.

The Plan also supports continued monitoring of air quality in the area. As noted in Chapter 2, MPO staff will use an ozone forecasting tool to monitor conditions through the summer and alert the community when conditions could be averse to citizen's health.

The Lexington area is currently meeting air quality standards and has been designated "attainment." However, air quality monitor readings indicate pollution levels are near national standards. The MPO will continue to monitor air quality issues and pursue policies and programs that have positive impacts to the region's air. As a former "non-attainment" area, Lexington is eligible for funding specifically earmarked for pollution reduction and the MPO is committed to take advantage of these funds.

## 4.6 Plan Evaluation

The MPO has evaluated how the investment strategies outlined within the 2045 MTP may impact our community. This includes modeling how congestion levels may change if the MTP is implemented. This section also describes how the MPO will ensure compliance with National Performance Management Goals & Measures and how we will also monitor locally-derived transportation goals. A Fiscal Constraint Analysis is also provided to show how revenues and expenditures within the MTP will be balanced.

### Fiscal Constraint Analysis

Long-range transportation plans that are developed by MPOs are required to be fiscally constrained, meaning only projects for which funding can be reasonably expected can be included in the plan. This includes expenditures on capital projects, operating and maintenance programs that are planned based on the anticipated revenues from local, state and federal sources. The follow exhibit summarizes all estimated revenues from these funding sources as well as the planned expenditures by project and program funding category (described in Chapter 4.3.2). These are shown in both current year and YOE dollars. Tables showing the MTP project expenditures based on the year in which they will be constructed – in comparison to revenues (also in YOE) - are shown in Appendix F.

**2045 MTP Fiscal Constraint Summary in Current Year Dollars**

| Improvement Type | Period | Funding Source | Revenue | Expenditures | YOE % | Ratio |
|---|---|---|---|---|---|---|
| Committed Projects (Completion of TIP and KY State Highway Plan) | 2019 - 2025 | FHWA | $ 348,360,000 | $ 348,360,000 | | 1.00 |
| Short-Term Projects (Modernization, Mobility & TSMO) | 2021-2025 | | $ 18,000,000 | $ 18,000,000 | | 1.00 |
| Long-Term Projects (Major Infra.,Modernization, Mobility & TSMO | 2026 - 2045 | | $ 800,000,000 | $ 800,000,000 | 4% | 1.00 |
| Transit Operations and Capital* (continuation of existing programs) | 2019 - 2045 | FTA | $ 723,678,725 | $ 854,488,224 | 1% | 0.85 |
| Operations and Maintenance (continuation of existing programs) | 2019 - 2045 | FHWA, State & Local | $ 567,000,000 | $ 567,000,000 | 4% | 1.00 |
| | | **Total** | $ 2,457,038,725 | $ 2,587,848,224 | | 0.95 |

**2045 MTP Fiscal Constraint Summary in Year of Expenditure Dollars**

| Improvement Type | Period | Funding Source | Revenue | Expenditures | YOE % | Ratio |
|---|---|---|---|---|---|---|
| Committed Projects (Completion of TIP and KY State Highway Plan) | 2019 - 2025 | FHWA | $ 348,360,000 | $ 348,360,000 | | 1.00 |
| Short-Term Projects (Modernization, Mobility & TSMO) | 2021-2025 | | $ 21,209,530 | $ 21,209,530 | | 1.00 |
| Long-Term Projects (Major Infra.,Modernization, Mobility & TSMO | 2026 - 2045 | | $ 1,567,436,800 | $ 1,567,436,800 | 4% | 1.00 |
| Transit Operations and Capital* (continuation of existing programs) | 2019 - 2045 | FTA | $ 812,776,297 | $ 1,085,010,288 | 1% | 0.75 |
| Operations and Maintenance (continuation of existing programs) | | FHWA, State & Local | $ 988,762,502 | $ 988,762,502 | 4% | 1.00 |
| | | **Total** | $ 3,738,545,129 | $ 4,010,779,120 | | 0.93 |

*Exhibit 4.12– 2045 MTP Fiscal Constraint Analysis in Current & Year of Expenditure Dollars.*

*Note: while Lextran's forecasted expenditures exceed anticipated revenue, Lextran will either pursue additional revenue through various grant opportunities or make necessary expenditure reductions.*

## Travel Demand Forecasting Model

The Lexington Area MPO's Travel Demand Model was used to forecast the impact of population and employment growth in the MPO Area in the year 2045 if no new transportation improvements are made ("No-Build" scenario) compared to the outcome of the 2045 MTP projects being implemented ("Build" scenario). As might be expected, congestion measured in Vehicle Hours Traveled (VHT) and Vehicle Miles Traveled (VMT) under a "No-Build" scenario increases.

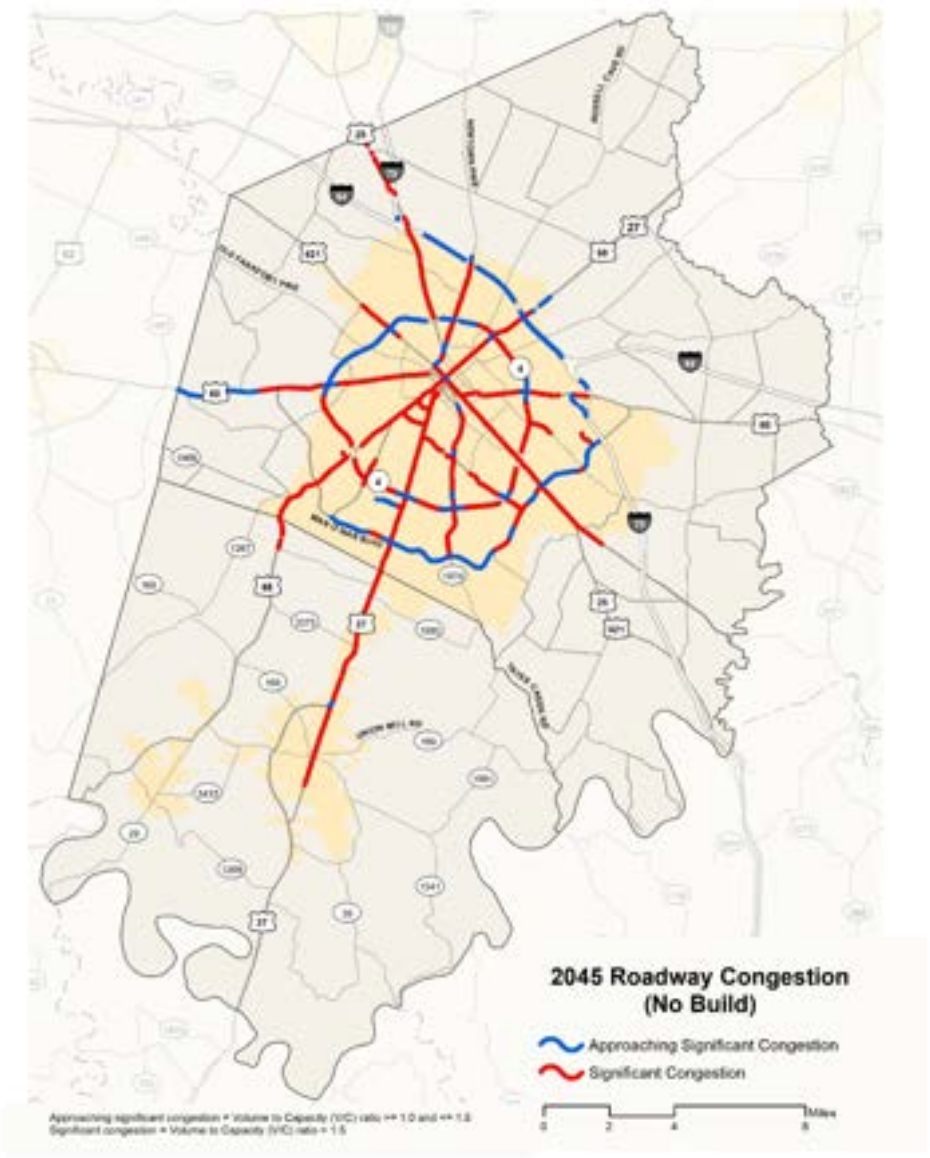
It is important to note that the model's "Build" scenario only measures vehicular travel patterns and roadway congestion resulting from population and employment growth in relation to projects that add roadway capacity (adding lanes, new roads, etc.). The model does not account for a reduction in congestion, VMT or VHT, that result from mode shifts to transit, bicycling, walking or telecommuting (modes expected to increase) nor can the model account for efficiencies gained from smaller-scale operational improvements such as advances in signal timing, the addition of turn lanes, roundabouts, access management and other targeted bottleneck improvements. Further, industry experts predict substantial efficiencies from the advent of connected and autonomous vehicles that will likely be fully implemented by 2045. Thus, in addition to calculating expected VMT and VHT resulting from implementing MTP capacity projects, the MPO also assumed an overall 15% improvement in system efficiency from technology, increased mixture of land uses, more compact urbanization, telecommuting and mode shifts between the "No Build" and "Build" Scenario. This assumption is reflected in the calculations in Exhibit 4.13

| Vehicle Miles of Travel on MPO Roadway Network | | | |
|---|---|---|---|
| Time Period | 2045 "No Build" | 2045 "Build" | % Change in VMT (Build vs No Build) |
| AM | 1,306,716 | 1,130,386 | -13.49 |
| MD | 2,457,841 | 2,122,659 | -13.64 |
| PM | 1,730,001 | 1,503,770 | -13.08 |
| NT | 2,371,644 | 2,040,582 | -13.96 |
| Daily | 7,866,202 | 6,797,397 | -13.59 |

| Vehicle Hours of Travel on MPO Roadway Network | | | |
|---|---|---|---|
| Time Period | 2045 "No Build" | 2045 "Build" | % Change in VHT (Build vs No Build) |
| AM | 30,642 | 26,183 | -14.55 |
| MD | 56,087 | 47,928 | -14.55 |
| PM | 41,060 | 34,715 | -15.45 |
| NT | 52,541 | 44,203 | -15.87 |
| Daily | 180,330 | 153,029 | -15.14 |

Exhibit 4.13 – Vehicle Miles of Travel & Vehicle Hours of Travel on the MPO Road Network in 2045 Under Build vs No Build Scenario

Exhibit 4.14 shows what vehicle congestion levels would look like on the existing street network in 2045 if no other transportation projects were built (beyond short-range committed projects) compared to congestion levels if the long range 2045 MTP projects are implemented.



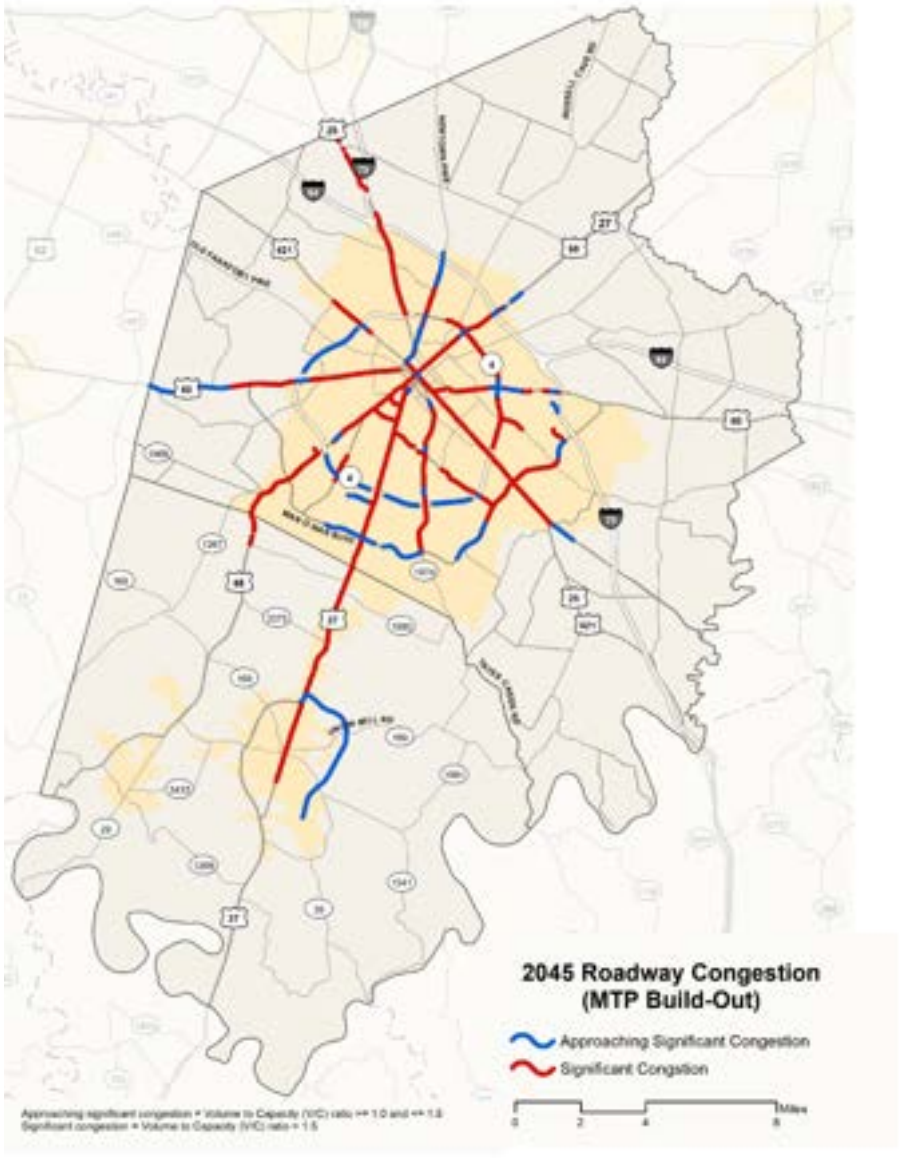




Exhibit 4.14 – Forecasted Congestion Levels on Major Roadways in 2045 Under "Build" and "No build" Scenario
Source: Lexington Area MPO Travel Demand Forecasting Model

## National Performance Goals & Measures

MAP-21 and the FAST Act placed an emphasis on incorporating performance management into transportation planning and programming processes. National performance goals have been established for seven key areas and states are required to establish performance targets in support of these national goals.

The MPO's Transportation Improvement Program (TIP) is required to describe how programs and projects in the TIP will help achieve these performance goals and targets. TIP projects are derived from the MTP. The MTP's project scoring matrix (Appendix D) was based on both federally-defined planning factors, locally-specific goals established by the MPO, and nationally mandated transportation system performance measures. The numeric project scores helped indicate the project's ability to accomplish MTP goals, to achieve national performance goals and provides a comparative level of importance in relation to other projects. The relationship of MTP project selection criteria and national goals are summarized below. The result is that projects that score higher and will best achieve these performance goals are programmed within the MTP.

| MAP-21 Goal Area | National Performance Goal | National Performance Measure | Related MPO Scoring Criteria (see Appendix D) |
|---|---|---|---|
| **Safety** | To achieve a significant reduction in traffic fatalities and serious injuries on all public roads | PM 1 Subpart B (Highway Safety) | A1, A2, A3, A4 & A5 |
| **Infrastructure condition** | To maintain the highway infrastructure asset system in a state of good repair | PM 2 Subpart C & D (Pavement & Bridges) | A3, A4, A5 & D9 |
| **Congestion reduction** | To achieve a significant reduction in congestion on the National Highway System | PM 3 Subpart G* (Traffic Congestion) | D1, D2, D3, D4, D6, D7, D8, G1 & G2 |
| **System reliability** | To improve the efficiency of the surface transportation system | PM 3 Subpart E & F (System Performance) | D1, D2, D3, D4, D5, D6, D7 & D8 |
| **Freight movement and economic vitality** | To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development | PM 3 Subpart F (Freight) | C3, D4, E1, E2, E3, E4 & E5 |
| **Environmental sustainability** | To enhance the performance of the transportation system while protecting and enhancing the natural environment | PM3 Subpart H* (Mobile Source Emissions) | A4, B1, B2, C2, D1, F2, F3, F4, G1, G2 & H2 |
| **Reduced project delivery delays** | To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices | | I1, I2, I3, I4, I5, I6 & J1 |

Exhibit 4.15 – Relationship of 2045 MTP project selection criteria to National Performance Goals & Measures

***** The FHWA mandated Transportation Performance Measures (TPM) that the Lexington Area MPO must report progress on include PM 1 (Subpart B), PM 2 (Subpart C & D) and PM 3 (Subpart E & F only). There are FTA mandated Transit Asset Management (TAM) measures as well. The specific measures are listed in detail in Appendix G.

The MPO is required to establish performance targets for each of these TPMs, or to support the KYTC's state targets (for highway-related PMs). The Lexington Area MPO elected to support the KYTC's state targets and worked in coordination with local transit agencies to adopt Transit Asset Management targets. These targets and baseline data for both the KYTC and Lexington Area MPO are discussed in Chapter 2 (see Exhibit 2.16 for Infrastructure Condition; see Exhibit 2.20 for System Performance/Reliability; see Exhibit 2.36 for Transit Asset Management; see Exhibit 2.44 for Safety) as well as summarized in Appendix G.

## Local Goals & Performance Criteria

It is important that local transportation plans and investment strategies also be based on locally-derived goals and desired outcomes which can also be supported by measurable data. Establishing locally adopted performance criteria to asses our progress towards achieving community goals can help us track whether there has been meaningful progress over time. Historical trend data for the Lexington area was outlined in Chapter 2 and serves as a baseline that can be used for deliberate performance tracking of local goals. These indicators will help inform whether or not actions from the MTP are resulting in the desired outcomes.

| Lexington MPO Goal Area | Lexington Area MPO Performance Criteria | Desired Trend |
|---|---|---|
| **Safety** | Number of fatalities | Down |
| | Number of injuries | Down |
| | Collision rates (vehicles, bike, pedestrian, transit) | Down |
| **Access/Choices** | Population within 1/2 mile transit | Up |
| | Transit ridership | Up |
| | Paratransit efficiency | Up |
| | Bike/walk rates | Up |
| | ADA Deficiencies | Down |
| | Bike/walk/transit options available in EJ areas | Up |
| **Connectivity** | Sidewalk & bikeway mileage | Up |
| | Street connectivity/density | Up |
| **Efficiency/ Reliability/ Maintenance** | Travel Time Reliability | Up |
| | Vehicle Hours Travel | Down |
| | Vehicle Miles of Travel (per capita) | Down |
| | Transit on-time performance | Up |
| | Road/bridge condition | Up |
| | Average commute time | Down |
| **Economic Vitality** | Combined housing & transportation cost | Down |
| | Regional commute time | Down |
| **Community / Environment** | Infill/redevelopment (population density) | Up |
| | Number of alternative fuel vehicles | Up |
| **Health and Wellness** | Ozone & PM2.5 levels | Down |
| | Obesity rate | Down |
| | Physical activity rate | Up |

Exhibit 4.16 – 2045 MTP Lexington Area MPO Goals & Performance Criteria

## 4.7 Implementation

Inclusion of a project or program in the 2045 MTP means that it has been identified as a regional priority for funding and is part of the MTP's financial plan. The Lexington Area 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 near-term (4 year) programs of scheduled transportation improvements. Projects that are included in the TIP/STIP are drawn from the highest priority transportation projects in the near term of the 2045 MTP. Projects in the TIP/STIP must be included the MTP and must help implement the goals of the long-range plan.

### Lexington Area MPO Transportation Improvement Program

The TIP is a phased, multi-year schedule for obligating federal funds to projects in the Lexington area. The MPO formally requests and obligates Federal-aid Highway Program funds from the Commonwealth of Kentucky and from the Federal Transit Administration through the TIP. The TIP must also include all regionally significant, non-federally funded projects. Like the MTP, the TIP must be fiscally constrained.

The TIP helps the MPO and the public track local, state and federal transportation funds and projects. The TIP is not as much a construction timeline as it is a financial program for scheduling and obligating federal funds; it represents the intent to construct or implement a specific project and the anticipated flow of federal funds and matching state or local contributions. 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.

### Kentucky Statewide Transportation Improvement Program

Many of the transportation projects and programs listed within the MTP will utilize funding that is ultimately programmed within the State Transportation Improvement Program (STIP) which is a 4-year subset of the 6-year Kentucky Highway Plan. The Highway Plan is developed by the KYTC and adopted by the Kentucky State Legislature every two years. Local priorities established by MPO's within their MTPs are considered by the Transportation Cabinet and Kentucky Legislature in developing the Highway Plan; however, concurrence with the MTP and local priorities is not guaranteed. Thus, it is incumbent upon the MPO to coordinate with the KYTC and to make our local Legislative Representatives aware of local priorities and the merits of local projects and programs. In 2018, the KY State Highway Plan was derived from the KYTC's new Strategic Highway Investment Formula For Tomorrow (SHIFT) which has significantly enabled better coordination between local and state officials in the developing the biennial State Highway Plan.

# Appendix A TPC Resolution Approving 2045 MTP

**RESOLUTION OF THE TRANSPORTATION POLICY COMMITTEE OF THE LEXINGTON AREA METROPOLITAN PLANNING ORGANIZATION APPROVING THE 2045 METROPOLITAN TRANSPORTATION PLAN**

WHEREAS, Section 134, Title 23, USC requires a continuing comprehensive transportation planning process be carried on cooperatively in areas of more than 50,000 population and that the urban transportation planning process shall include development of a 20 year, fiscally balanced plan of transportation improvement projects; and

WHEREAS, the Transportation Policy Committee is the official decision making body of the Lexington Area Metropolitan Planning Organization (MPO) for the Lexington Urbanized Area, and is responsible for developing a Transportation Plan; and

WHEREAS, the 2045 Metropolitan Transportation Plan was developed by the Lexington Area MPO and reviewed by the Kentucky Transportation Cabinet and appropriate federal, state and local officials; and

WHEREAS, the transportation planning process is being carried on in conformance with all Federal requirements and has been so certified; and

WHEREAS, the Lexington Urbanized Area has been found to be in attainment of national air quality standards; and

THEREFORE BE IT RESOLVED, that the MPO Transportation Policy Committee, at its regular public meeting of April 24, 2019, approves the 2045 Metropolitan Transportation Plan for the Lexington Urbanized Area.

David K West — April 24, 2019

David K. West, Jessamine County Judge Executive — Date
Chair, Lexington Area Metropolitan Planning Organization

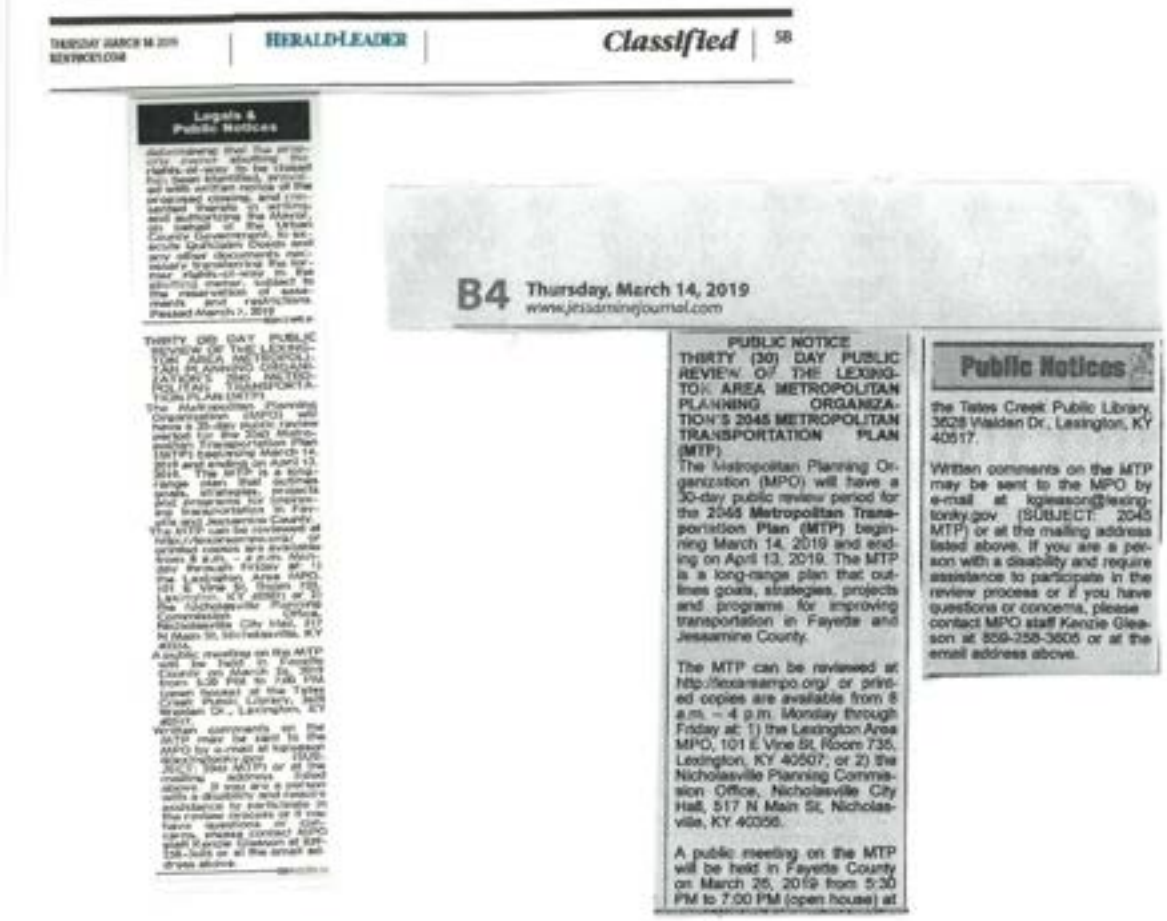
# Appendix B Grouped Projects

Projects types listed in the Grouped Projects table below may be added by an Administrative Modification to the MTP.

| Grouped Projects * |
|---|
| **Safety Related** |
| Highway Safety Improvement Project (HSIP) - Low Cost Safety Improvements |
| Highway Safety Improvement Project (HSIP) - Roadway Resurfacing Improvements |
| Highway Safety Improvement Project (HSIP) - Lane Departure Roadway Section Improvement |
| Highway Safety Improvement Project (HSIP) - Pedestrian Safety Project |
| Highway Safety Improvement Project (HSIP) - High Risk Rural Roads |
| Intersection Improvements for Safety or Efficiency |
| Guardrail/Median Cable Projects |
| Other Highway Safety Improvements |
| Rail Crossing Separation |
| Rail Crossing Protection |
| **Operations & Maintenance Related** |
| Intelligent Transportation System (ITS) Projects |
| Traffic Signal System Improvements |
| Highway Signing |
| Pavement Markers and Striping |
| Pavement Resurfacing, Restoration, and Rehabilitation |
| Bridge Rehabilitation |
| Bridge Replacement |
| Bridge Inspection |
| Bridge Painting |
| Ferry Boat Equipment/Service Upgrades |
| **Bicycle & Pedestrian Related** |
| Safe Routes to School (SRTS) |
| Bicycle and Pedestrian Facilities |
| **Grant Programs** |
| Transportation Enhancement (TE) Projects |
| Surface Transportation Block Grant Set-Aside (STBG-TA) |
| Congestion Mitigation Air Quality (CMAQ) Projects |
| Recreational Trails Program (RTP) |
| Transportation, Community, and System Preservation (TCSP) |
| **Transit & Ridesharing Related** |
| Commuter Ridesharing Programs |
| Park & Ride Facilities |
| Construction or Renovation of Transit Facilities |
| Purchase of New Buses |
| Rehabilitation of Transit Vehicles |
| Transit Passenger Shelters and Information Kiosks |
| Transit Operating Assistance |
| Transit Operating Equipment |
| Other Transit Improvement Project |

# Appendix C Participation

## MTP 2045 Legal Ad



HERALD-LEADER | Classified | 5B

Legals & Public Notices

B4 Thursday, March 14, 2019
www.jessaminejournal.com

PUBLIC NOTICE

THIRTY (30) DAY PUBLIC REVIEW OF THE LEXINGTON AREA METROPOLITAN PLANNING ORGANIZATION'S 2045 METROPOLITAN TRANSPORTATION PLAN (MTP)

The Metropolitan Planning Organization (MPO) will have a 30-day public review period for the 2045 **Metropolitan Transportation Plan (MTP)** beginning March 14, 2019 and ending on April 13, 2019. The MTP is a long-range plan that outlines goals, strategies, projects and programs for improving transportation in Fayette and Jessamine County.

The MTP can be reviewed at http://lexareampo.org/ or printed copies are available from 8 a.m. – 4 p.m. Monday through Friday at: 1) the Lexington Area MPO, 101 E Vine St, Room 735, Lexington, KY 40507; or 2) the Nicholasville Planning Commission Office, Nicholasville City Hall, 517 N Main St, Nicholasville, KY 40356.

A public meeting on the MTP will be held in Fayette County on March 26, 2019 from 5:30 PM to 7:00 PM (open house) at the Tates Creek Public Library, 3628 Walden Dr., Lexington, KY 40517.

Written comments on the MTP may be sent to the MPO by e-mail at kgleason@lexingtonky.gov (SUBJECT: 2045 MTP) or at the mailing address listed above. If you are a person with a disability and require assistance to participate in the review process or if you have questions or concerns, please contact MPO staff Kenzie Gleason at 859-258-3605 or at the email address above.

Public Notices

# Appendix C Participation (cont'd)

## Results of Public Outreach for the Draft 2045 MTP

A formal 30-day public comment period regarding the Draft 2045 MTP was held from March 14 to April 13, 2019. The MPO issued a media release, legal ad and paid Facebook ads. Two interviews were broadcast on WKYT regarding the plan and public meeting. During the input period, 1,425 new users visited the MPO's webpage (5 times more than average). There were 6,400 direct views of Facebook posts regarding the plan and paid Facebook ads appeared in the newsfeed of 9,500 users. Just over 100 people viewed and responded to the poll "7 Take-aways of the 2045 MTP." Thirty members of the public attended the public meeting held on March 26. Twenty-two written comments were received by the MPO during the comment period and are summarized below.

Results from the first round of public input are also found in Appendix C of the MTP. More than 2,000 residents and commuters responded to an initial survey that the MPO conducted in late 2018, which helped inform the plan's development.

| Public Comment | Staff Response |
|---|---|
| **General Comments:** | |
| Seven comments regarding a desire for a regional rail system to encompass Louisville, Lexington, Covington and Eastern Kentucky. | A cost-feasible plan to provide a regional rail service has yet to be realized. The most comprehensive study of the feasibility of passenger rail was commissioned by the KY Transportation Cabinet in 1999. |
| Seven comments regarding transit including: more bus service/frequency, Park-n-Ride and Regional Transit operations, specifically to Scott and Jessamine County. | Section 4.5.1 "Transit Expansion/Improvements" discusses desired transit improvements and the MTP recommends funding for additional transit resources via the "Mobility & TSMO" funding category, as well as support for planning efforts to improve & expand services. |
| Five comments voicing support for more bike and walkways, specifically on major arterials for commuting purposes. | The MPO stipulates that all MTP projects will include quality bicycle/pedestrian facilities appropriate for the roadway based on traffic volumes and speeds. The MTP also recommends funding for stand-alone bike/ped projects via the "Mobility & TSMO" funding |

| | |
|---|---|
| | category in order to implement the MPO's 2018 Regional Bicycle & Pedestrian Master Plan. |
| Two comments voicing non-support for the building of new roads and road widening. | The MTP only prescribes major widening along a select number of roadways as identified through travel demand analysis. A larger number of MTP projects do not prescribe widening, only safety/multimodal improvements and other upgrades to improve traffic flow. The primary purpose of the few new collector street connections identified in the plan is to help alleviate congestion on nearby major roads. |
| Three comments voicing support for more multi-modalism, complete streets and road diets. | A foundational principle of the MTP is a more sustainable transportation system and complete streets. See 4.1 and 4.2 |
| Eight comments voicing concern with congestion and traffic light timing, specifically on major arterials – New Circle Rd, Nicholasville Rd, Man O War Blvd. | MTP projects are identified for all of these roadways. Signal timing comments were forwarded to the LFUCG Traffic Engineering department. |
| Two comments concerning road pavements. | Comments were forwarded to the LFUCG Streets and Roads department and District 7. |
| Two comments concerning safety, specifically reflectors on rural roads. | Comments were forwarded to the LFUCG Streets and Roads department and KYTC District 7. |

| **Specific Road Comment** | |
|---|---|
| Nicholasville Rd multiple comments: better access, desire for regional transit, install bike paths and sidewalks, too much congestion, traffic signalization timing needs improvement and better ADA access at Southland Dr., add round- about at Limestone and Scott St. | MTP project # 9, 26 and 27 in the MTP identify projects along Nicholasville Rd to improve and increase transit service, to provide better access management and multi-modal improvements. The design of the intersection at Limestone will be determined during project #3 Scott Street Connector (Oliver Lewis Way). |

| | |
|---|---|
| New Circle Rd multiple comments: better access at intersections, too much congestion, install sound barriers | Projects are identified in the MTP to widen most of the limited access portion of New Circle Rd (MTP project #'s 13, 14, 15 & 16). The installation of sound walls would be considered during the design process of these projects. Multimodal and operational improvement projects are identified along the signalized portion of New Circle Rd (MTP project #5, 6 & 18). |
| Tates Creek Rd multiple comments: too much congestion, traffic light signalization needs improvement, bikeways and sidewalks are needed | MTP project # 7 - Tates Creek Rd from Malibu Dr to Armstrong Mill seeks to reduce congestion, especially in the vicinity of New Circle Rd, and includes multimodal improvements. |
| Man O War multiple comments: better access, too much congestion (specifically, Alumni to Winchester) | MTP project # 4, 8 & 10 are identified to reduce congestion on Man O War Blvd from Alumni Dr to Winchester Rd. |
| Harrodsburg Rd, 1 comment: widen from Jessamine Co. line to New Circle Rd | The MPO's Travel Demand Model does not indicate that this is a high priority need at this time compared to other MTP projects. The MPO Congestion Management Committee is currently exploring lower cost bottleneck improvement projects along major corridors that do not have a programmed MTP project. |
| I-75 Connector, 4 comments in favor of the project not being included in the constrained project list – commenters cited high project costs, environmental and scenic impacts | While the MTP does not include funding for this project at this time it does explicitly state that the MPO should continue to work with partners to explore opportunities to meet the current and future Jessamine County interstate access and connectivity needs. |
| UK Neighborhoods, 1 comment: concern about impact to neighborhoods surrounding UK from road closures | The MTP does not identify potential future road closures. The MPO typically has the opportunity to comment on roadway closures that are undertaken at the local level. |
| East Jessamine Bypass, 1 comment: comment voicing non-support for the constructing the East Jessamine Bypass | This project has been included in former iterations of the MTP for many years. One section is currently under construction. The |

| | |
|---|---|
| | 2045 MTP continues commitment to this project. |
| "Y" Intersection at KY 29 and 68, 1 comment: regarding the desire to improve the Y Intersection for safety reasons | The MTP commits funding for this project slated for construction in 2020 per the 2018 Kentucky Highway Plan. |
| US 25, 1 comment: desire for US 25 (Georgetown Rd) from Spurr Rd to Ironworks Pike to have safety improvements and better traffic flow management | The MTP commits funding for the continued development of this project (design is complete). The MPO and District 7 have identified this as a high priority project for funding consideration in SHIFT and the resulting 2020 Kentucky Highway Plan. |
| East Brannon Rd, 2 comments: desire for sidewalks from Brannon Crossing to Tates Creek Rd | Right-of-way was secured for sidewalks by KYTC during the former roadway project. Sidewalks could be constructed by private entities if/when future adjacent parcels develop or could be constructed with public funds, but priority should be considered in relation to projects identified in the MPO Bicycle & Pedestrian Plan. |
| Greendale Rd, 1 comment: upgrade Greendale Rd between Citation and Leestown | MTP project # 55 includes upgrades to modernize and make multimodal improvements to Greendale Rd. |
| Parker's Mill Rd, 1 comment: repair and widen Parker's Mill from Cardinal Run Park to Man O War; 1 comment to improve Parkers Mill Rd from Lane Allen to Versailles Rd. | MTP project # 51 & 52 include upgrades to modernize and make multimodal improvements to Parkers Mill Rd. Project # 52 (Lane Allen to Versailles Rd) was shifted from 2041-2045 to 2036-2040 in response to this comment. |
| Old Todd's Rd, 1 comment: add sidewalks, intersection at Mt. Tabor is congested and needs lighting or signage | The design phase for sidewalk construction on Old Todds is underway. The MTP classifies this as a "committed" project with the intent to allocate construction funds before 2025. |
| Concerning Bus Rapid Transit and Business Access Transit Lanes on Nicholasville Rd, 1 comment: Improve the means by which busses pull off to bus stops and re-enter lanes without hindering traffic | The MPO will be conducting an in depth study of land use changes and phased transportation improvements, with an emphasis on transit improvements, along the Nicholasville Rd corridor in 2019/2020. |

# Appendix C Participation (cont'd)

## Results of Public Poll - Key Points of the 2045 MTP

As part of the public-outreach effort, the MPO summarized key points from the MTP and conducted a poll asking readers to react to each statement. Their reaction could range from "Very Unhappy" to "Very Happy." In all, there were 108 responses and the average reaction for all seven statements fell somewhere between "Happy" and "Very Happy". The results for each statement are summarized below. Key points #5, 6 & 7 received the best ratings overall.

Note that the percentages are based on the actual number of responses received for each statement.

**Point #1 (104 Responses)**

The MTP proposes spending nearly 60% of the estimated funding for the MPO area on our major infrastructure needs. This includes addressing congestion on most of New Circle Road, and on Man O' War Blvd from Alumni Drive to Winchester Road. Completing the east Nicholasville Bypass is also a priority.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 2 | 2% |
| Unhappy | 5 | 5% |
| Indifferent | 23 | 22% |
| Happy | 31 | 30% |
| Very Happy | 43 | 41% |

**Point #2 (108 Responses)**

The MTP proposes spending nearly 30% of funds to upgrade 38 roadway segments to address safety and access with improvements such as curbs, sidewalks, bikeways and turn lanes.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 3 | 3% |
| Unhappy | 3 | 3% |
| Indifferent | 14 | 13% |
| Happy | 35 | 32% |
| Very Happy | 53 | 49% |

**Point #3 (106 Responses)**

The MTP proposes spending 13% of funds on lower cost, high impact strategies to improve traffic flow and reduce the number of vehicles on our roads. Typical projects could include targeting bottlenecks by upgrading traffic signals and turn lanes, adding sidewalks & bikeways and applying new technologies.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 1 | 1% |
| Unhappy | 2 | 2% |
| Indifferent | 12 | 11% |
| Happy | 29 | 27% |
| Very Happy | 62 | 58% |

**Point #4 (106 Responses)**

The MTP includes several new roads to connect gaps in our transportation network to help reduce traffic on our major roads.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 6 | 6% |
| Unhappy | 4 | 4% |
| Indifferent | 13 | 12% |
| Happy | 25 | 24% |
| Very Happy | 58 | 55% |

**Point #5 (107 Responses)**

The MTP includes several projects along Nicholasville Road with the goal of significantly improving transit service and better managing access. The plan also supports local efforts to create a well-designed, people-friendly corridor making it easier to get around without a car.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 5 | 5% |
| Unhappy | 7 | 7% |
| Indifferent | 8 | 7% |
| Happy | 24 | 22% |
| Very Happy | 63 | 59% |

**Point #6 (108 Responses)**

The MTP financially supports the MPO's 2018 Regional Bicycle and Pedestrian Plan which proposes a connected network of sidewalks, bikeways and trails to make it easy and safe for people of all ages and abilities to bike and walk.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 4 | 4% |
| Unhappy | 6 | 6% |
| Indifferent | 7 | 6% |
| Happy | 19 | 18% |
| Very Happy | 72 | 67% |

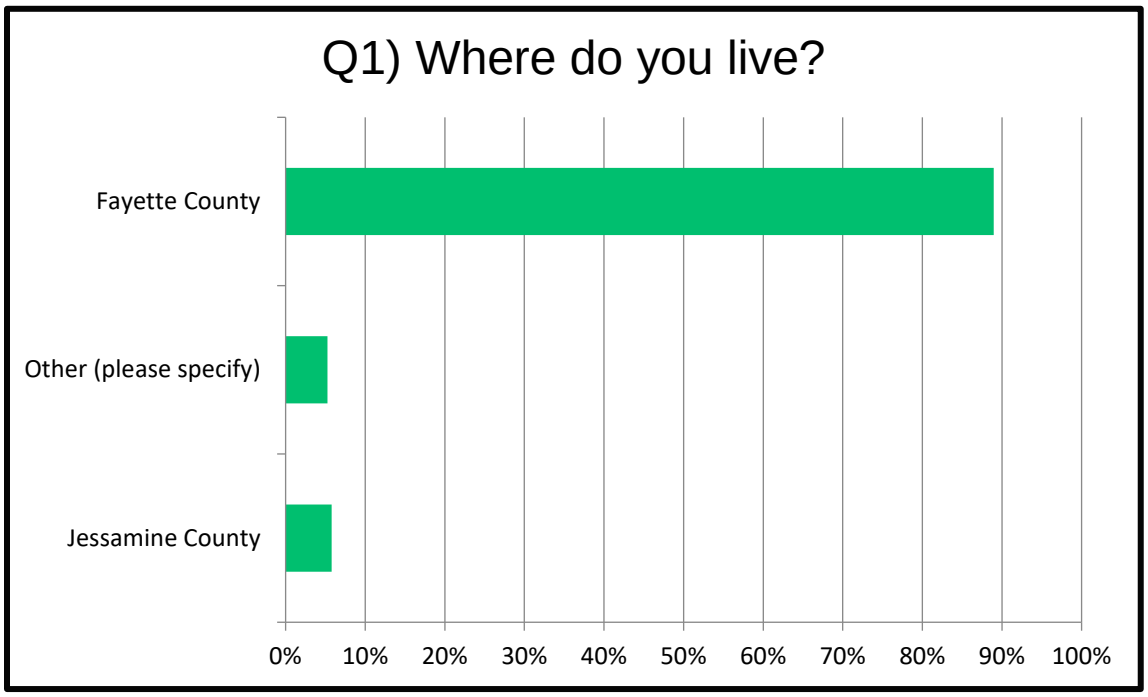
**Point #7 (107 Responses)**

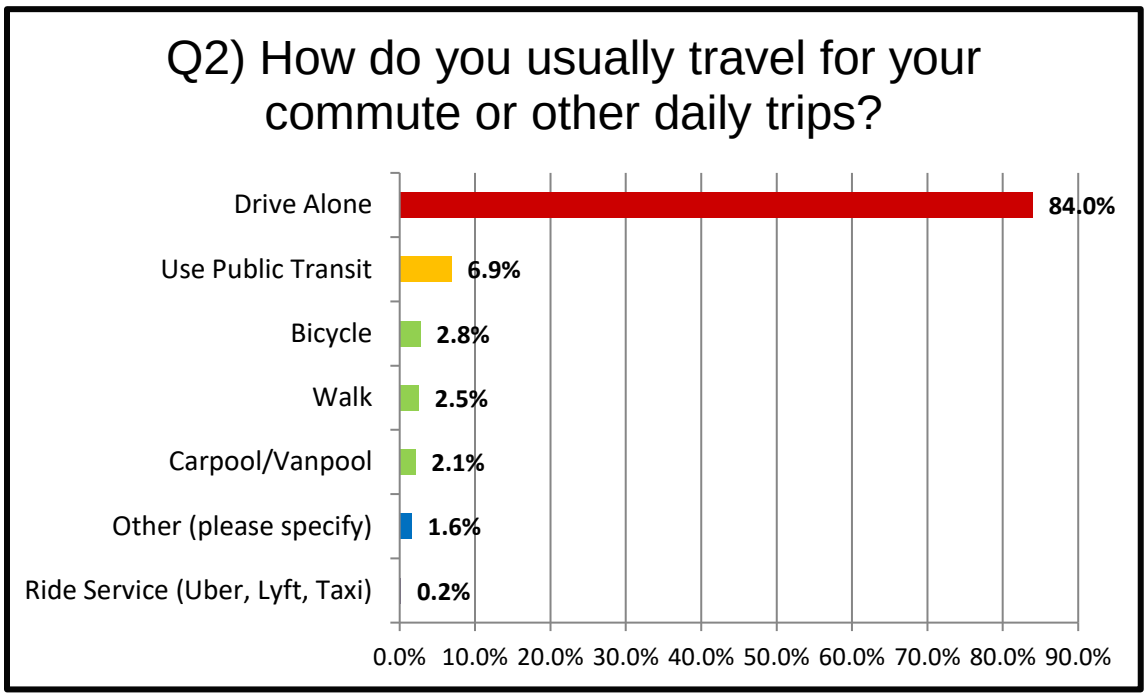
The MTP supports a fix-it-first approach making sure that our transportation infrastructure (pavement, bridges, etc.) is well maintained.

| RESPONSE | RESPONDENTS | PERCENTAGE |
|---|---|---|
| Very Unhappy | 1 | 1% |
| Unhappy | 0 | 0% |
| Indifferent | 8 | 7% |
| Happy | 33 | 31% |
| Very Happy | 65 | 61% |

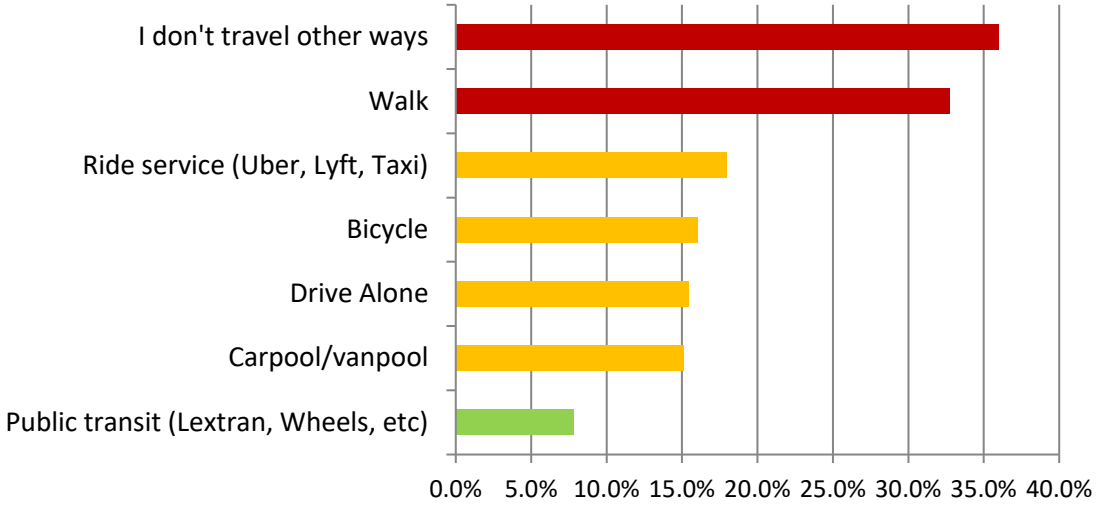
# Appendix C Participation (cont'd)

## MTP 2045 Transportation Survey Results (2,209 responses)

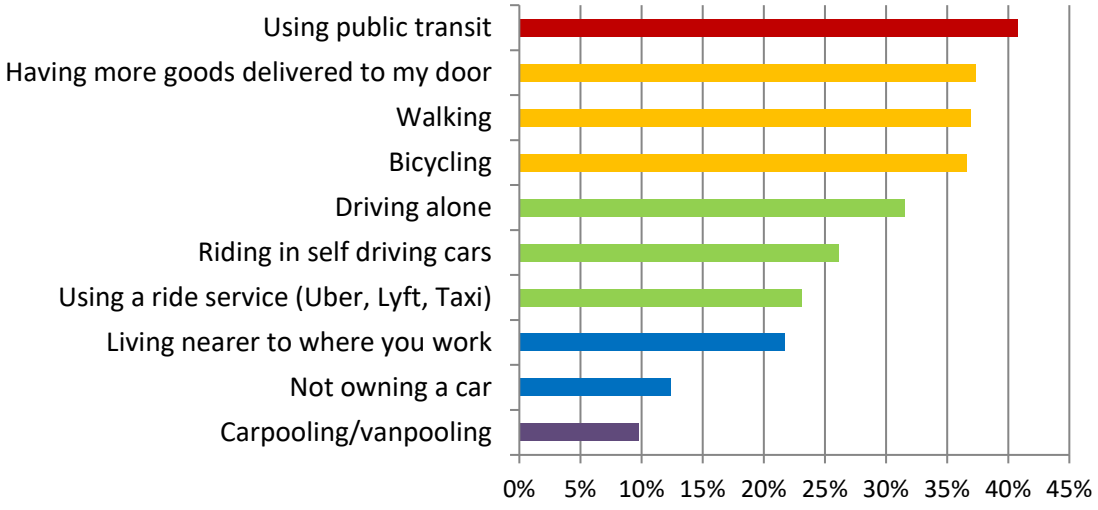


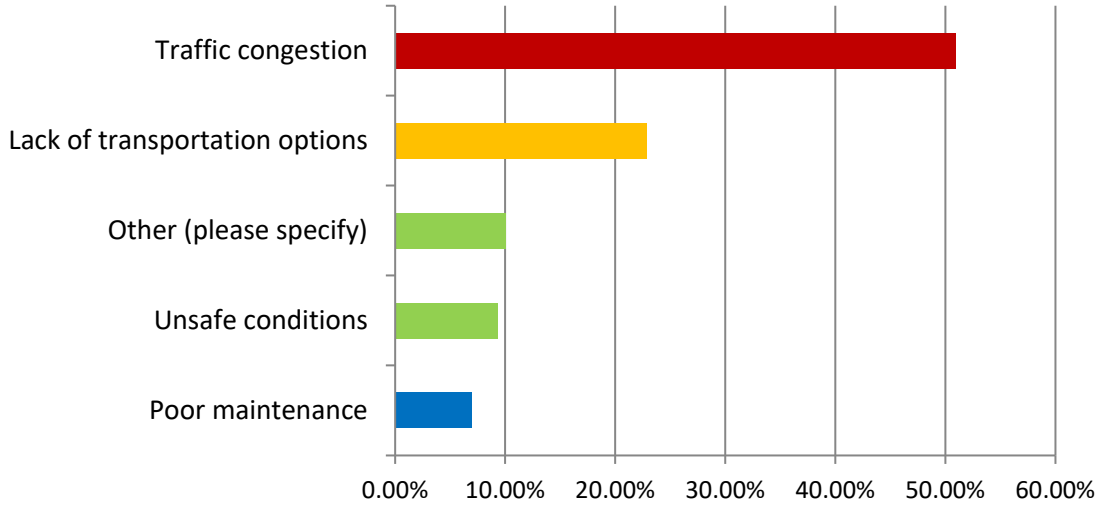
## Q3) Are there other ways you sometimes travel (choose one or more)?



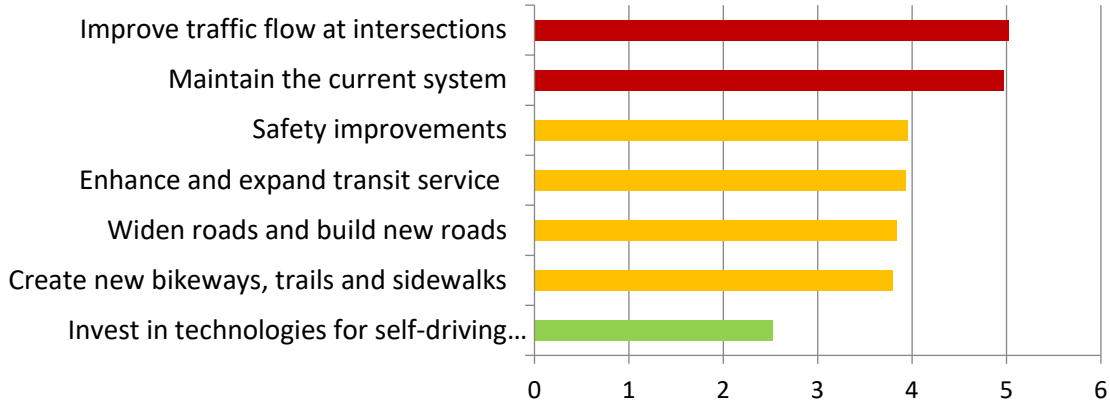

## Q4) Are you interested in any of the following either today or in the future?



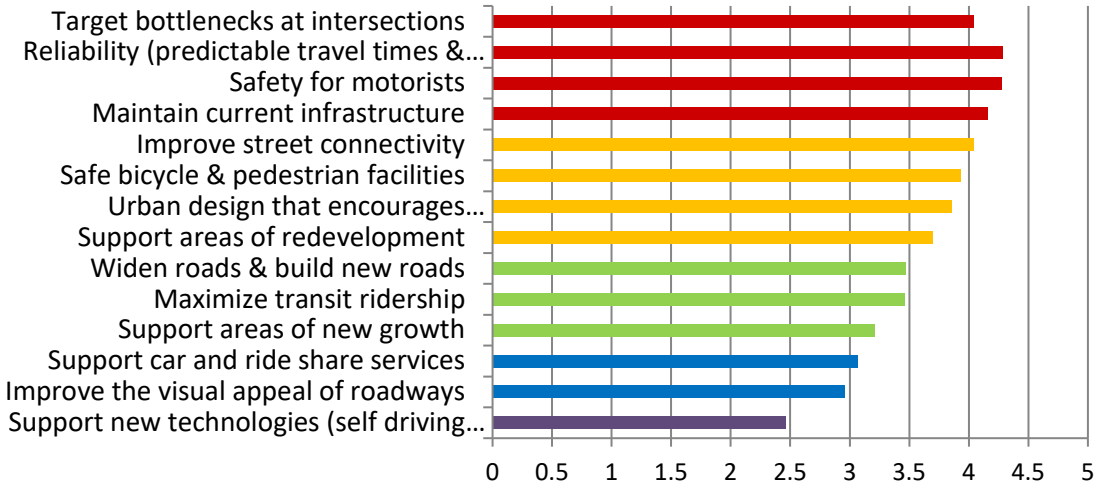
## Q5) What is the biggest transportation challenge facing the Lexington Area?



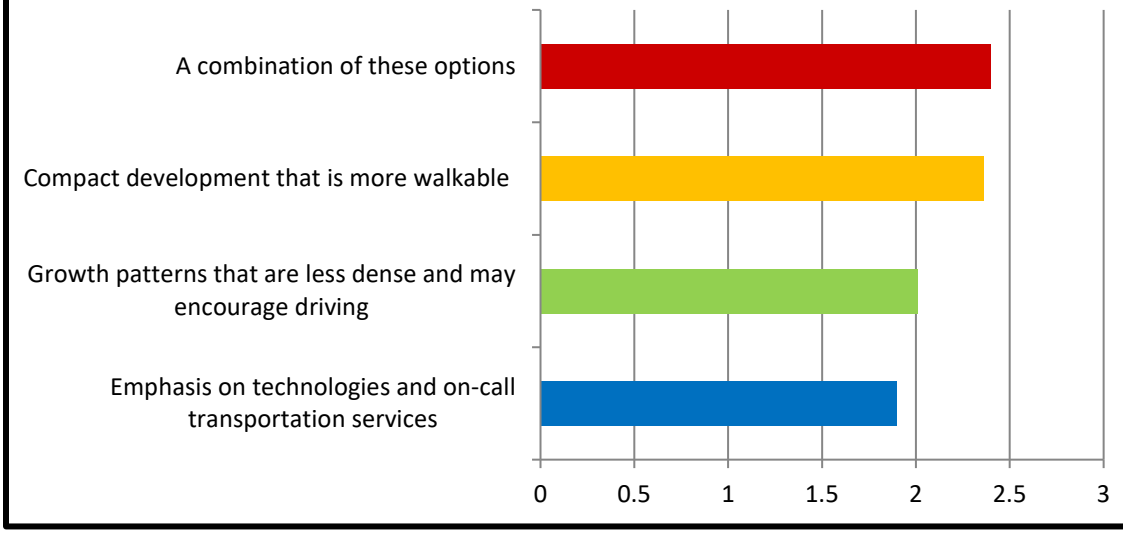

## Q6) Knowing that funding is limited, please rank the following from most to least important.



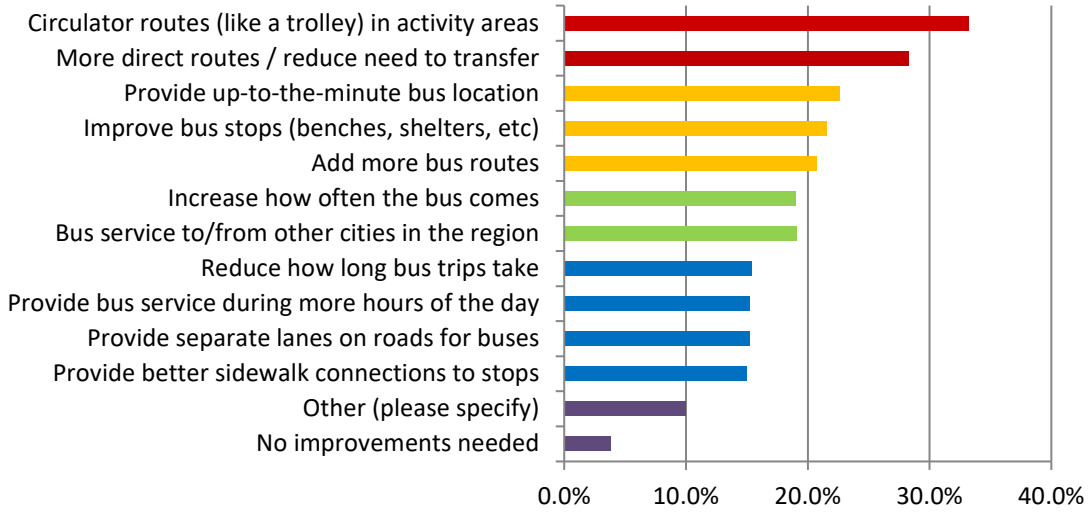
## Q7) When ranking the priority of projects and initiatives, how important are these measures?




## Q8) As our region continues to grow, which of these is most important to you?

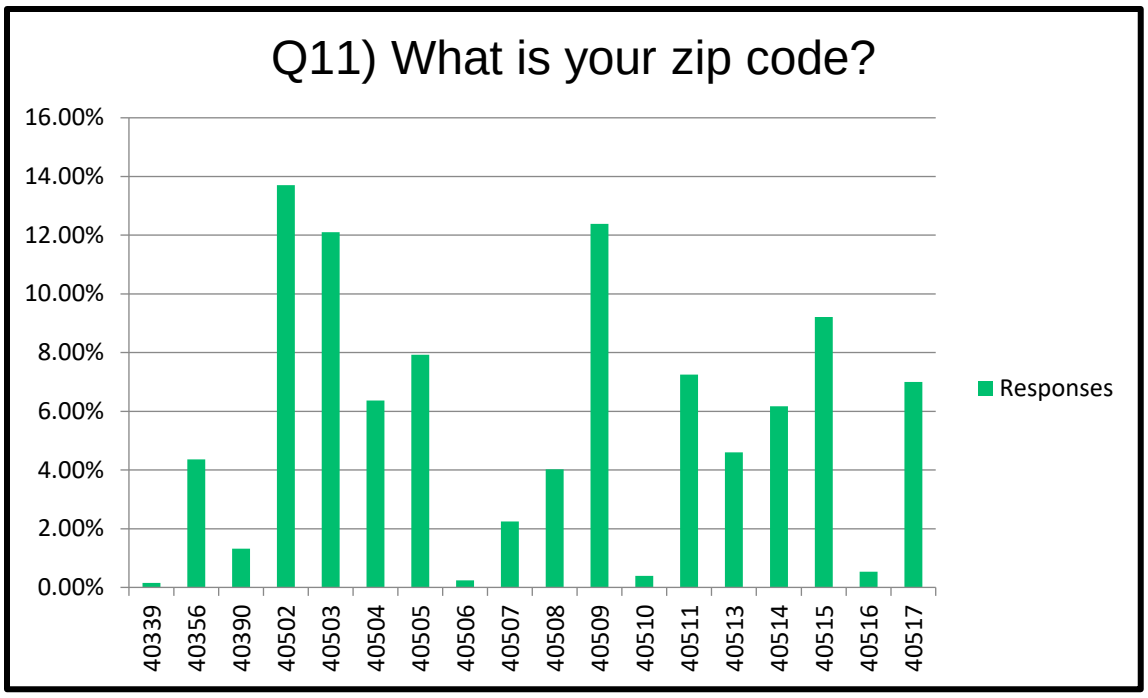


## Q9) What are the three most important needs to improve our transit system?




Q10) Please share any other thoughts on improving transportation or specific areas/routes of concern.

The responses to this questions can be divided into 6 main categories including: bike/ped, congestion, regionalism, transit, greenways and other. Other was the largest category which included maintenance, safety, signage, and automated cars/technology. Congestion was the second largest category which included traffic signalization, congestion, bottlenecks, roundabouts/double diamonds, and major roads and intersections. The third largest category was transit which included trolleys, transit, bus rapid transit/bus lanes, bus pull offs, more stops/stations, more bus shelters, more bus routes, extended bus routes, evening/weekend services, more bus times, better bus time management, smaller buses, park-n-ride, and carpool. The fourth largest are was bike/ped which included more bikeways (lanes, paths, and trails), more bike and walk ways. More walkways (sidewalks and crosswalks), bike share, multimodal, and bike safety. The fourth largest area was regionalism including regional transit, regional rail, and regional planning. The last category was greenways which includes streetscaping, conservation, and greenways/greenspace/context sensitive design.


Q11) What is your zip code?
16.00%
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
40339
40356
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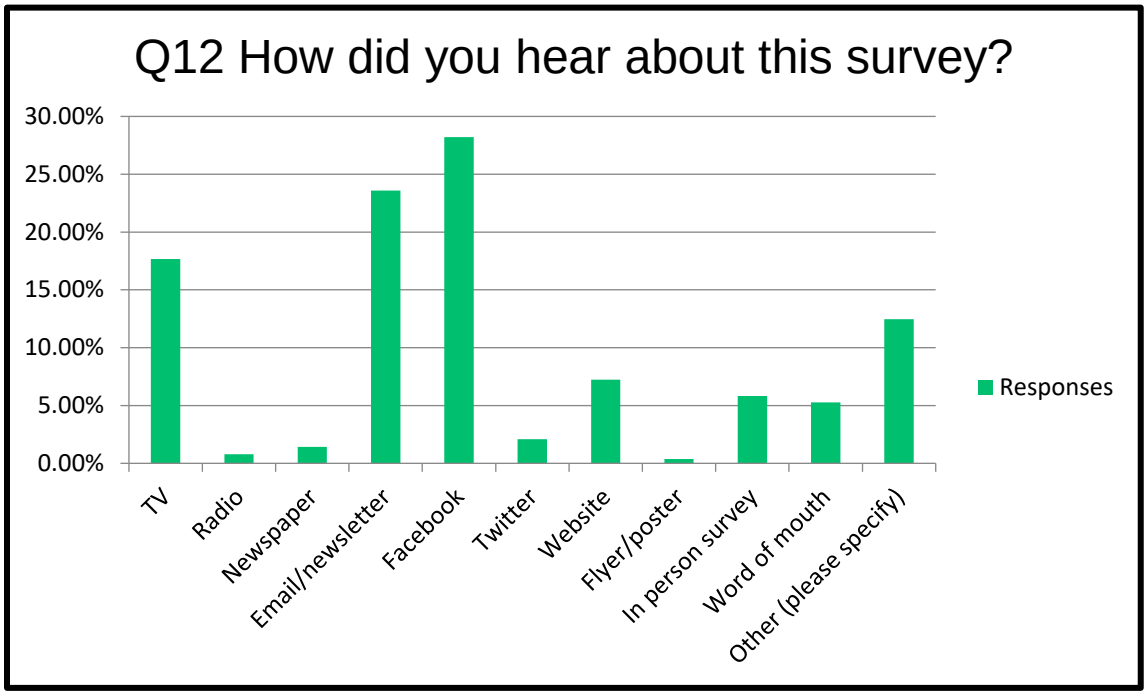
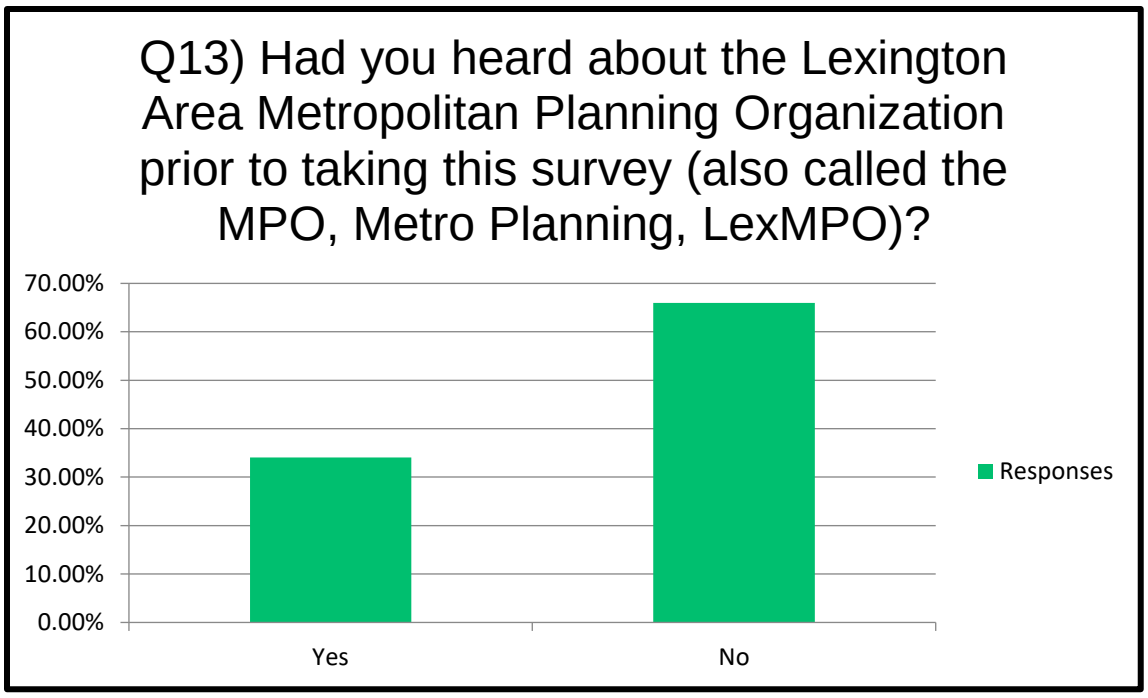
Responses


Q12 How did you hear about this survey?
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
TV
Radio
Newspaper
Email/newsletter
Facebook
Twitter
Website
Flyer/poster
In person survey
Word of mouth
Other (please specify)
Responses


Q13) Had you heard about the Lexington Area Metropolitan Planning Organization prior to taking this survey (also called the MPO, Metro Planning, LexMPO)?
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Yes
No
Responses

# Appendix D Project Scoring Process

## Background

To assist in the selection of worthy transportation projects, staff has developed a scoring process and used it to prioritize projects. It is based on the 2045 Plan Goals and Objectives and procedures developed for the 2045 MTP. Staff also looked at scoring processes by other MPOs and modified the criteria for local needs.

This methodology provides a systematic approach to scoring many projects which will need to be evaluated while developing a financially constrained regional transportation plan. The numeric ranking for each project determines the staff's recommendation of a relative comparison with other projects. It is meant to provide information to decision makers for a final recommended list of projects in the 2040 Plan.

## The Scoring Process

The process uses criteria based on goals and objectives of the Plan. The first eight are factors that apply to all projects and are directly aligned with the plan's goals. The final criterion was developed specifically to address project history and feasibility. It is anticipated that most projects will incorporate multimodal improvements that address the concept of "complete streets". All users (highway, transit, bike, and pedestrian) should be accommodated as much as practical on all projects.

All criteria are awarded points on a sliding scale as indicated or with a point for meeting the criteria.

**Projects Criterion – 118 Points Possible**

# Lexington Area MPO

## 2045 MTP - PROJECT SCORING CRITERIA

| GOAL | DESCRIPTION | MEASURE | PTS | TOTAL POINTS |
|---|---|---|---|---|
| A: Safety | How the crash rates (in MVM) in the project area compare to statewide averages. The crash history in the project area, and any safety improvement strategies included in the project. | A1: CCRF or Potential Crash Reduction Factor: | 0 - 8 | 20 |
| | | - CCRF < 2 > 3 = 6 to 8 pts | | |
| | | - CCRF < 1 > 2 = 4 to 5 pts | | |
| | | - CCRF > 1 = 0 to 3 pts | | |
| | | A2: Crash history | 0 - 3 | |
| | | A3: Highway improvements | 0 - 3 | |
| | | A4: Bike/Ped improvements | 0 - 3 | |
| | | A5: Intersection improvements | 0 - 3 | |
| B: Access, Choices and Equity | The extent to which the project includes or enhances multimodal transportation, environmental justice and ADA access. | B1: Transit Service improvements | 0 - 3 | 10 |
| | | B2: Bike/Ped improvements | 0 - 3 | |
| | | B3: EJ Access Improvements | 0 - 3 | |
| | | B4: Corrects an ADA compliance issue | 0 - 1 | |
| C: Connectivity | How the project improves connectivity by mode and regionally. | C1: Automobile & Transit | 0 - 3 | 10 |
| | | C2: Bike / Ped | 0 - 3 | |
| | | C3: Regional | 0 - 4 | |
| D: Efficient, Reliable, and Well-Maintained | The extent to which the project reduces congestion. The observed travel time and delay in the project area, and the project impact on system condition. | D1: Multimodal: Transit and/or Bike/Ped Improvements | 0 - 4 | 25 |
| | | D2: Operational: ITS, Signalization, Access Management, Signage, Wayfinding | 0 - 4 | |
| | | D3: Capacity: Add lanes, intersection/interchange reconstruction | 0 - 4 | |
| | | D4: Level of Travel Time Reliability Index (LOTTR) / Truck Travel Time Reliability (TTTR) | 0 - 4 | |
| | | D5: Project is on the CMP Network | 0 - 1 | |
| | | D6: Project is on the NHS Network | 0 - 1 | |
| | | D7: Project is on an arterial or above. | 0 - 1 | |
| | | D8: V/C and/or LOS from Transportation Model | 0 - 3 | |
| | | D9: Project upgrades existing facility | 0 - 3 | |
| E: Economic Vitality | The extent to which the project supports existing, expanding or new employment areas and its anticipated impact on freight and goods movement. | E1: Project serves a high employment area | 0 - 2 | 10 |
| | | E2: Project provides multi-modal access to jobs/retail | 0 - 2 | |
| | | E3: Project provides access to a new planned growth area | 0 - 2 | |
| | | E4: Project serves a major shipping/distribution center | 0 - 2 | |
| | | E5: Project is on a designated or anticipated truck route | 0 - 2 | |
| F: Community Character | The extent to which the project supports quality growth. | F1: Project is located in area of new growth | 0 - 2 | 10 |
| | | F2: Project supports infill/redevelopment | 0 - 3 | |
| | | F3: Project includes placemaking/context sensitive enhancements | 0 - 2 | |
| | | F4: Project supports a mixed-use, high density area | 0 - 3 | |
| G: Environment | The extent to which the project mitigates its environmental impact. | G1: Project reduces VMT/VHT and/or improves air quality | 0 - 3 | 5 |
| | | G2: Project improves sustainability (multimodal/bottleneck) | 0 - 2 | |
| H: Health and Wellness | The extent to which the project promotes health and wellness and reduces emissions. | H1: Project provides opportunities for increased physical activity | 0 - 2 | 5 |
| | | H2: Project reduces vehicle emissions | 0 - 3 | |
| I: Project History and Feasibility | The projects likelihood of success, based on its history, support and anticipated obstacles. | I1: Project already has detailed planning and engineering | 0 - 5 | 20 |
| | | I2: Project is in a previous TIP, MTP, or community plan | 0 - 2 | |
| | | I3: Project has funding support | 0 - 2 | |
| | | I4: Project is a public priority | 0 - 4 | |
| | | I5: Project is a local officials priority | 0 - 4 | |
| | | I6: Project has no known ROW/environmental obstacles | 0 - 3 | |
| J: Project Cost/Benefit | The anticipated cost/benefit of the project ranging from 0 (high cost/low benefit) to 3 (low cost/high benefit) | J1: Project Cost/Benefit | 0 - 3 | 3 |
| | | | TOT | 118 |

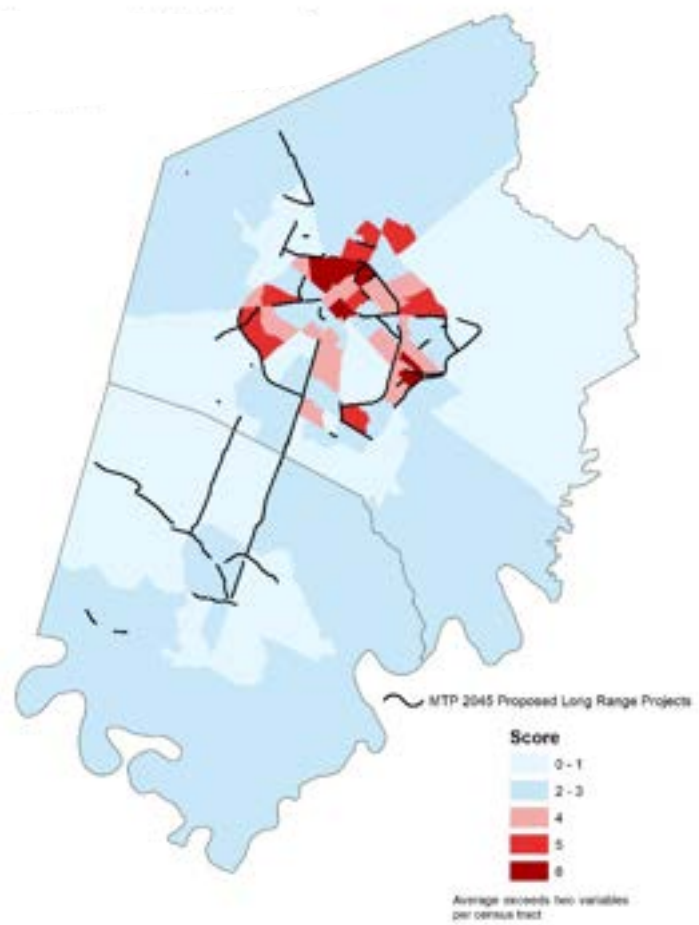
UPDATED: 1/15/2019

# Appendix E Title VI, Environmental Justice & Social Equity

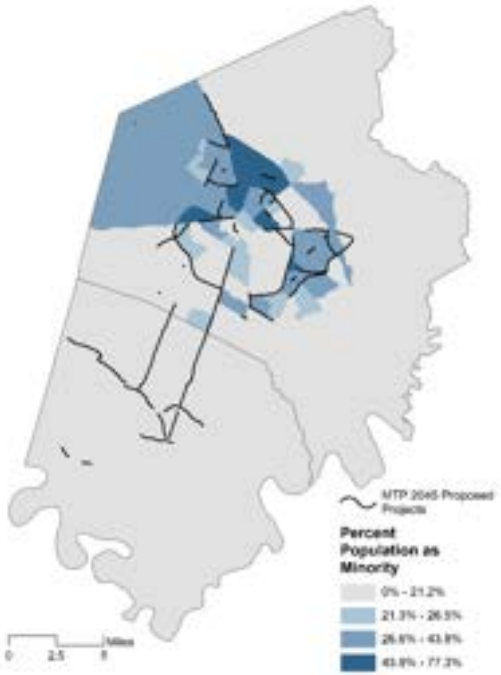
## Equitable Target Areas

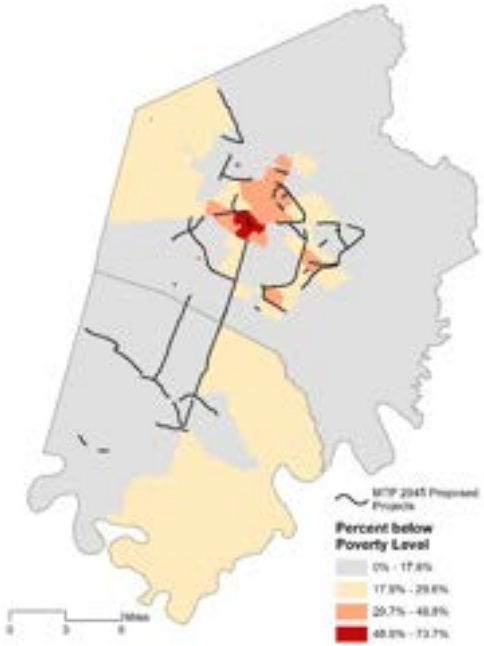
The Equitable Target Area (ETA) Maps were developed from US Census data to identify environmental justice (EJ) communities in the Lexington Area MPO. EJ communities are protected by national EJ Policies, including Title VI of the Civil Rights Act of 1964 and Presidential Executive Orders 12898 and 13166. Identifying Equitable Target Areas helps the MPO's ensure that there is an equitable distribution of transportation services, facilities and resources within the community without regard to income, race, age, ability and other socio-economic factors; and to ensure that there are not disproportionate negative impacts or burdens on minority and low-income populations.

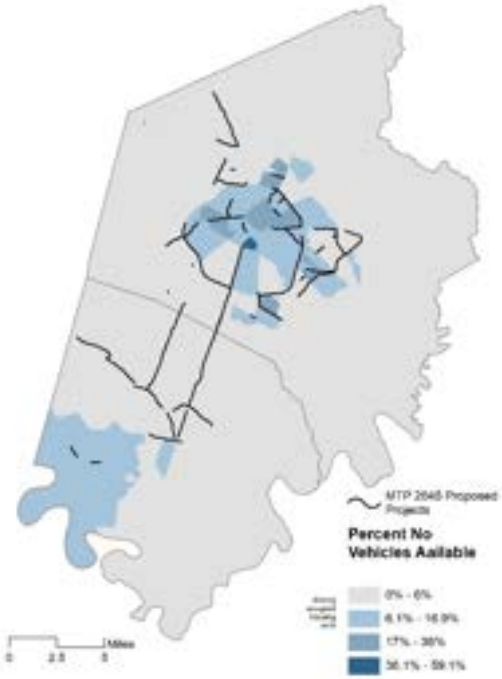
To identify these ETAs, a regional average for certain socio-economic demographics was established utilizing the 2008-2012 American Community Survey 5 year Estimates. A regional "threshold" was identified and census tracts that exceeded that threshold were identified as an EJ census tract. For example, the average percentage of the population in the Lexington Area that is living below the poverty level is 17.8%. Census tracts that meet or exceed this threshold were them mapped.

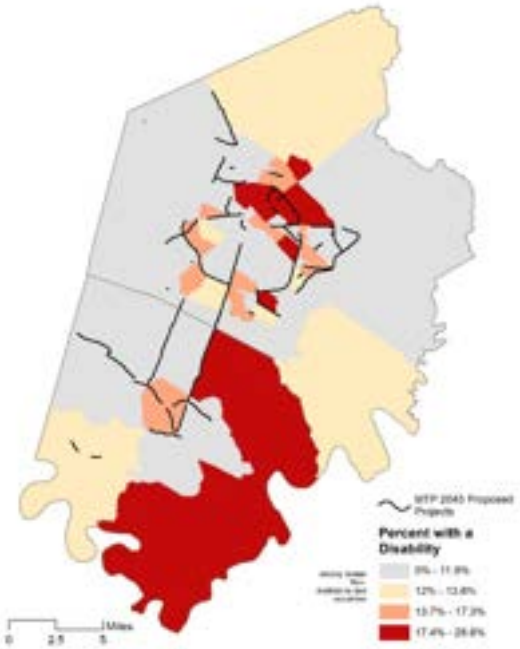


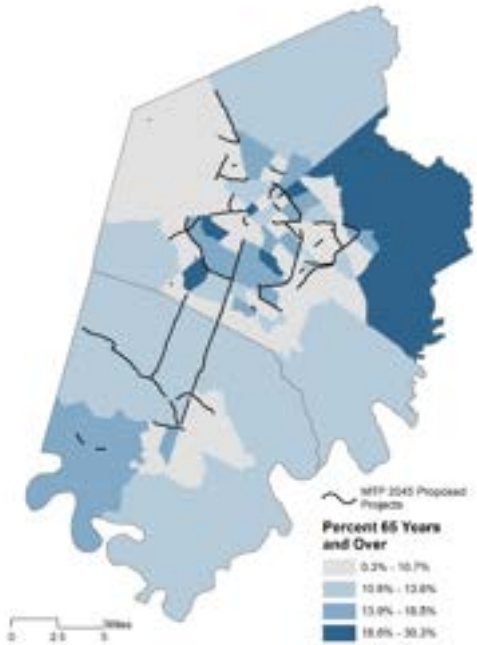

A compilation of Equitable Target Areas was generated to demonstrate the greatest concentrations of EJ-sensitive populations. Darker areas on the map to the left indicates greater concentrations of various EJ groups. This information was incorporated into the Project Scoring Process. Projects were awarded extra points if they would better serve and/or improve multimodal facilities in higher areas of concentration of the targeted groups. The projects were also evaluated in terms of ensuring an equal distribution of projects for all residents of the region as well as examining whether projects that could have real or perceived negative impacts were not disproportionately impacting EJ groups.

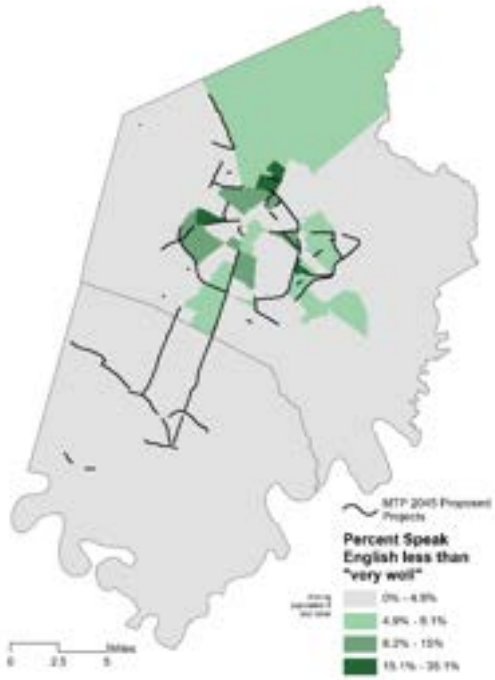

MTP 2045 Proposed Projects
Percent Population as Minority
0% - 21.2%
21.3% - 26.5%
26.6% - 43.8%
43.8% - 77.3%
Miles
0
2.5
5


MTP 2045 Proposed Projects
Percent below Poverty Level
0% - 17.6%
17.9% - 29.6%
29.7% - 48.8%
48.8% - 73.7%
Miles
0
5


MTP 2045 Proposed Projects
Percent No Vehicles Aailable
0% - 6%
6.1% - 16.9%
17% - 36%
36.1% - 59.1%
Miles
0
2.5
5


MTP 2045 Proposed Projects
Percent with a Disability
0% - 11.8%
12% - 13.6%
13.7% - 17.3%
17.4% - 28.6%
Miles
0
2.5
5


MTP 2045 Proposed Projects
Percent 65 Years and Over
0.3% - 10.7%
10.8% - 13.6%
13.9% - 18.5%
18.6% - 30.3%
Miles
0
2.5
5


MTP 2045 Proposed Projects
Percent Speak English less than "very well"
0% - 4.9%
4.9% - 8.1%
8.2% - 15%
15.1% - 35.1%
Miles
0
2.5
5

# Appendix F Year of Expenditure Project Tables

The following tables expand on the Major Infrastructure and Modernization project tables in Exhibits 4.6 and 4.7 which only show project costs in current year dollars. These tables show project costs in current year dollars and in Year of Expenditure costs. As discussed in chapter 3, to calculate YOE costs, current project costs were inflated 4% per year to the midpoint of the 5-year period in which projects are scheduled. For each five-year project table below an estimated amount is also shown for Mobility & TSMO projects, which are selected annually, in addition to the Major Infrastructure and Modernization projects. A detailed discussion of the three broad project categories can be found in chapter 4 and in Exhibits 4.1, 4.4.and 4.5.

The final tables in Appendix E summarize how the long range (2026-2045) project expenditures are balanced with the anticipated revenues to satisfy the requirement of fiscal constraint.

# 2026 - 2030 Project Tables

| MTP ID# | County | Route | Road Name | From | To | Project Description | Cost-Today | Cost-YOE |
|---|---|---|---|---|---|---|---|---|
| 1 | Jessamine | New Road | Nich. Eastern Bypass (I-B) | KY 169 | US 27 | Construct New Road | $ 38,000,000 | $ 54,085,850 |
| 2 | Fayette | US 25 | Georgetown Rd. | Spurr Rd | south of Ironworks Pike | Modernize & Widen Roadway | $ 40,590,000 | $ 57,772,230 |
| 3 | Fayette | New Road | Scott Street Connector | Oliver Lewis Way | S Limestone | Construct New Road | $ 22,880,000 | $ 32,565,370 |
| 4 | Fayette | CS 4524 | Man O' War Blvd. | I-75 | Liberty Rd | Reduce Congestion / Multimodal Improvements | $ 9,760,000 | $ 13,891,520 |
| 24 | Fayette | US 60 | Versailles Rd (3A) | Mason Headley | Oxford Circle | Modernize Roadway / Multimodal Improvements | $ 1,520,000 | $ 2,163,430 |
| 25 | Fayette | US 60 | Versailles Rd (3B) | Oxford Circle | Red Mile | Modernize Roadway / Multimodal Improvements | $ 10,180,000 | $ 14,489,310 |
| 26 | Fayette | New Road | Hamburg Connector | Polo Club | Sir Barton | Construct New Road (under I-75) | $ 4,880,000 | $ 6,945,760 |
| 27 | Fayette | US 27 | Nicholasville Rd. | Cooper Dr. | Brannon Rd | Bus rapid transit (Ph 1) - infrastructure | $ 10,000,000 | $ 14,233,120 |
| 28 | Fayette | US 27 | Nicholasville Rd. | Cooper Dr. | Southland Dr | Reduce Congestion / Multimodal Improvements | $ 4,600,000 | $ 6,547,230 |
| 29 | Fayette | CS 2418 | Liberty Rd. | Appletree Ln. | Winchester Rd | Modernize Roadway / Multimodal Improvements | $ 1,200,000 | $ 1,707,970 |
| 30 | Fayette | US 60 | Winchester Rd. | Midland Ave | New Circle Rd | Access Management / Multimodal Improvements | $ 2,700,000 | $ 3,842,940 |
| 31 | Fayette | CS 3037 | Armstrong Mill Rd. | Tates Creek | Man O' War Blvd. | Modernize Roadway / Multimodal Improvements | $ 8,850,000 | $ 12,596,310 |
| 32 | Fayette | CS 2230 | Loudon Av. | Oakhill Dr | Bryan Ave | Modernize Roadway / Multimodal Improvements | $ 5,550,000 | $ 7,899,380 |
| 33 | Fayette | US 60 | Winchester Rd. | Sir Barton | I-75 (eastbound) | Add Lane / Multimodal Improvements | $ 928,000 | $ 1,320,830 |
| 34 | Fayette | US 60 | Winchester Rd. | I-75 | Patchen Wilkes Dr (westbound) | Add Lane / Multimodal Improvements | $ 2,235,000 | $ 3,181,100 |
| 35 | Jessamine | KY 29 | Wilmore Rd. | Hoover Dr | Central Ave | Reduce Congestion / Modernize Roadway / Multimodal | $ 4,440,000 | $ 6,319,500 |
| 36 | Fayette | New Road | Old Rosebud connector | Existing Old Rosebud | Liberty Rd | Construct New Road | $ 3,240,000 | $ 4,611,530 |
| 37 | Fayette | I 75 | I-75 | Winchester Rd | Man or War | Add Southbound Auxillary Ln | $ 1,387,000 | $ 1,974,130 |
| | | | | | | Mobility & TSMO Projects: | $ 27,060,000 | $ 38,952,930 |

| 2026 - 2030 Summary | Cost-Today | Cost-YOE |
|---|---|---|
| Major Infrastructure: | $ 111,230,000 | $ 158,314,970 |
| Modernization: | $ 61,710,000 | $ 87,832,540 |
| Mobility & TSMO: | $ 27,060,000 | $ 38,952,930 |
| Total Expenditures: | $ 200,000,000 | $ 285,100,440 |
| Anticipated Revenues: | $ 200,000,000 | $ 285,100,440 |

# 2031 - 2035 Project Tables

| MTP ID# | County | Route | Road Name | From | To | Project Description | Cost-Today | Cost-YOE |
|---|---|---|---|---|---|---|---|---|
| 5 | Fayette | KY 4 | New Circle Rd. | Trade Center Dr | Woodhill | Reduce Congestion / Multimodal Improvements | $ 25,500,000 | $ 44,157,750 |
| 6 | Fayette | KY 4 | New Circle Rd. | Boardwalk | N Limestone | Reduce Congestion / Multimodal Improvements | $ 18,750,000 | $ 32,468,930 |
| 7 | Fayette | KY 1974 | Tates Creek Rd. | Malabu Dr | Armstrong Mill Rd | Reduce Congestion / Multimodal Improvements | $ 12,000,000 | $ 20,780,120 |
| 8 | Fayette | CS 4524 | Man O' War Blvd. | Liberty Rd | Richmond Rd | Reduce Congestion / Multimodal Improvements | $ 13,480,000 | $ 23,343,000 |
| 9 | Fay / Jess | US 27 | Nicholasville Rd. | Man O War | Nicholasville Byp. | Reduce Congestion / Access Mgmt & Multimodal Improve. | $ 40,000,000 | $ 69,267,060 |
| 38 | Fayette | CS 7038 | Wilson-Downing Rd. | Belleau Wood Dr. | Tates Creek Road | Reduce Congestion / Multimodal Improvements | $ 2,040,000 | $ 3,532,620 |
| 39 | Fayette | CS 2690 | Old Todds Rd. | Catera Trace | Palumbo | Modernize Roadway / Multimodal Improvements | $ 8,400,000 | $ 14,546,080 |
| 40 | Fayette | CS 2690 | Old Todds Rd. | Palumbo | Liberty Rd | Modernize Roadway / Multimodal Improvements | $ 8,600,000 | $ 14,892,420 |
| 41 | Jessamine | KY 169 | N 3rd St. | Nich W Bypass | Oak Street | Modernize Roadway / Multimodal Improvements | $ 11,750,000 | $ 20,347,200 |
| 42 | Fayette | KY 1723 | Forbes Rd. | Leestown Rd | Versailles Rd | Modernize Roadway / Multimodal Improvements | $ 4,330,000 | $ 7,498,160 |
| 43 | Fayette | CS 1321 | Russell Cave Rd. | Loudon | New Circle Rd | Modernize Roadway / Multimodal Improvements | $ 5,000,000 | $ 8,658,380 |
| 44 | Jessamine | KY 29 | Wilmore Rd. | Lone Oak | Hoover Dr | Intersection Safety / Multimodal Improvements | $ 4,780,000 | $ 8,277,410 |
| 45 | Fayette | US 60 | Versailles Rd (4) | Red Mile | Porter Place | Modernize Roadway / Multimodal Improvements | $ 3,540,000 | $ 6,130,130 |
| 46 | Fayette | US 60 | Versailles Rd (5) | Porter Pl | Oliver Lewis Way | Modernize Roadway / Multimodal Improvements | $ 3,780,000 | $ 6,545,740 |
| 47 | Fayette | New Road | Twain Ridge Connector | Existing Twain Ridge | Harrodsburg Rd | Construct New Road | $ 4,160,000 | $ 7,203,770 |
| 48 | Jessamine | KY 1268 | Main St (Wilmore) | KY 29 | Kinlaw Dr | Modernize Roadway / Multimodal Improvements | $ 6,250,000 | $ 10,822,980 |
| | | | | | | Mobility & TSMO Projects: | $ 27,640,000 | $ 48,396,530 |

| 2031 - 2035 Summary | Cost-Today | Cost-YOE |
|---|---|---|
| Major Infrastructure: | $ 109,730,000 | $ 190,016,860 |
| Modernization: | $ 62,630,000 | $ 108,454,890 |
| Mobility & TSMO: | $ 27,640,000 | $ 48,396,510 |
| Total Expenditures: | $ 200,000,000 | $ 346,868,260 |
| Anticipated Revenues: | $ 200,000,000 | $ 346,868,260 |

# 2036 - 2040 Project Tables

| MTP ID# | County | Route | Road Name | From | To | Project Description | Cost-Today | Cost-YOE |
|---|---|---|---|---|---|---|---|---|
| 10 | Fayette | CS 4524 | Man O' War Blvd. | Winchester Rd | I-75 | Modernize / Widen Roadway / Multimodal Improvements | $ 10,750,000 | $ 22,648,630 |
| 11 | Jessamine | KY 169 | Keene Rd. | US 68 | Keene Way Dr | Modernize Roadway / Multimodal Improvements | $ 22,000,000 | $ 46,350,680 |
| 12 | Fayette | CS 4524 | Man O' War Blvd. | Richmond Rd | Alumni Dr | Reduce Congestion / Multimodal Improvements | $ 10,970,000 | $ 23,112,140 |
| 13 | Fayette | KY 4 | New Circle Rd. | Versailles Rd | Harrodsburg Rd | Major Widening | $ 37,250,000 | $ 78,480,130 |
| 14 | Fayette | KY 4 | New Circle Rd. | Woodhill Dr | Alumni Dr | Major Widening | $ 30,000,000 | $ 63,205,480 |
| 49 | Jessamine | US 27X | Main St (Nicholasville) | Richmond Ave (KY169) | US 27 Byp | Add Lane / Multimodal Improvements | $ 10,900,000 | $ 22,964,660 |
| 50 | Fayette | CS 1257 | Mercer Rd. | Greendale | US 25 (Georgetown) | Modernize Roadway / Multimodal Improvements | $ 11,380,000 | $ 23,975,940 |
| 51 | Fayette | KY 1968 | Parkers Mill Rd. | Lane Allen Rd | Man O War | Modernize Roadway / Multimodal Improvements | $ 8,550,000 | $ 18,013,560 |
| 52 | Fayette | KY 1968 | Parkers Mill Rd. | Versailles Rd | Lane Allen Rd | Modernize Roadway / Multimodal Improvements | $ 11,660,000 | $ 29,888,130 |
| 53 | Fayette | KY 1978 | Greendale Rd. | US 421 | Citation Blvd | Modernize Roadway / Multimodal Improvements | $ 7,250,000 | $ 15,274,660 |
| 54 | Fayette | CS 4174 | Clays Mill Rd. | KY 1980 | Twain Ridge | Modernize Roadway / Multimodal Improvements | $ 7,490,000 | $ 15,780,300 |
| 55 | Jessamine | KY 3433 | Jessamine Station Rd. | RR overpass | Woodspointe Dr | Address Drainage / Multimodal Improvements | $ 1,500,000 | $ 3,844,960 |
| 56 | Fayette | US 421 | Leestown Rd. | Railroad underpass | | Address Drainage | $ 2,500,000 | $ 6,408,260 |
| | | | | | | Mobility & TSMO Projects: | $ 25,460,000 | $ 54,288,840 |

| 2036 - 2040 Summary | Cost-Today | Cost-YOE |
|---|---|---|
| Major Infrastructure: | $ 110,970,000 | $ 233,797,060 |
| Modernization: | $ 61,230,000 | $ 136,150,470 |
| Mobility & TSMO: | $ 27,800,000 | $ 52,070,770 |
| Total Expenditures: | $ 200,000,000 | $ 422,018,300 |
| Anticipated Revenues: | $ 200,000,000 | $ 422,018,300 |

# 2041 - 2045 Project Tables

| MTP ID# | County | Route | Road Name | From | To | Project Description | Cost-Today | Cost-YOE |
|---|---|---|---|---|---|---|---|---|
| 15 | Fayette | KY 4 | New Circle Rd. | Alumni Dr. | Tates Creek Rd | Widen to 6 lanes | $ 30,500,000 | $ 78,180,780 |
| 16 | Fayette | KY 4 | New Circle Rd. | Harrodsburg Rd | Nicholasville Rd | Major Widening | $ 39,250,000 | $ 100,609,690 |
| 17 | Jessamine | KY 169 | Keene Rd. | US 68 | 0.5 miles north of Clear Creek Rd. | Modernize Roadway | $ 38,856,000 | $ 99,599,750 |
| 18 | Fayette | KY 4 | New Circle Rd. | N Limestone | Eastland Pkwy | Reduce Congestion / Multimodal Improvements | $ 29,250,000 | $ 74,976,650 |
| 57 | Jessamine | CS 4174 | Clays Mill Rd. | Brannon Rd. | Catnip Hill (KY 3375) | Construct New Road | $ 9,000,000 | $ 18,961,640 |
| 58 | Jessamine | CS 4174 | Clays Mill Rd. | Catnip Hill (KY 3375) | KY 169 (Keene Rd) | Construct New Road | $ 9,000,000 | $ 18,961,640 |
| 59 | Fayette | KY 1977 | Spurr Rd. | Georgetown Rd | Masterson Station | Modernize Roadway / Multimodal Improvements | $ 7,550,000 | $ 19,352,950 |
| 60 | Fayette | US 60 | Winchester Rd. | Polo Club | Man O War | Modernize / Widen Roadway / Multimodal Improvements | $ 7,020,000 | $ 17,994,400 |
| 61 | Fayette | CS 1325 | Sandersville Rd. | Railroad underpass | | Modernize Roadway / Multimodal Improvements | $ 7,220,000 | $ 18,507,060 |
| | | | | | | Mobility & TSMO Projects: | $ 32,244,000 | $ 83,440,100 |

| 2041 - 2045 Summary | Cost-Today | Cost-YOE |
|---|---|---|
| Major Infrastructure: | $ 137,856,000 | $ 353,366,870 |
| Modernization: | $ 39,790,000 | $ 55,854,410 |
| Mobility & TSMO: | $ 22,354,000 | $ 104,228,500 |
| Total Expenditures: | $ 200,000,000 | $ 513,449,780 |
| Anticipated Revenues: | $ 200,000,000 | $ 513,449,780 |

# 2026 - 2045 Expenditures vs. Revenue

| EXPENDITURES | 2026-2030 | | 2031-2035 | | 2036-2040 | | 2041-2045 | | 2045 MTP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Today | YOE | Today | YOE | Today | YOE | Today | YOE | Today | YOE |
| Major Infrastructure: | $ 111,230,000 | $ 158,314,970 | $ 109,730,000 | $ 190,016,860 | $ 110,970,000 | $ 233,797,060 | $ 137,856,000 | $ 353,366,870 | $ 469,786,000 | $ 935,495,760 |
| Modernization: | $ 61,710,000 | $ 87,832,540 | $ 62,630,000 | $ 108,454,890 | $ 61,230,000 | $ 136,150,470 | $ 39,790,000 | $ 55,854,410 | $ 225,360,000 | $ 388,292,310 |
| Mobility & TSMO: | $ 27,060,000 | $ 38,952,930 | $ 27,640,000 | $ 48,396,510 | $ 27,800,000 | $ 52,070,770 | $ 22,354,000 | $ 104,228,500 | $ 104,854,000 | $ 243,648,710 |
| Totals: | $ 200,000,000 | $ 285,100,440 | $ 200,000,000 | $ 346,868,260 | $ 200,000,000 | $ 422,018,300 | $ 200,000,000 | $ 513,449,780 | $ 800,000,000 | $ 1,567,436,780 |

| REVENUES | 2026-2030 | | 2031-2035 | | 2036-2040 | | 2041-2045 | | 2045 MTP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Today | YOE | Today | YOE | Today | YOE | Today | YOE | Today | YOE |
| Major Infrastructure: | $ 112,500,000 | $ 160,369,000 | $ 112,500,000 | $ 195,113,410 | $ 112,500,000 | $ 237,385,290 | $ 137,500,000 | $ 288,815,500 | $ 475,000,000 | $ 881,683,200 |
| Modernization: | $ 62,500,000 | $ 89,093,890 | $ 62,500,000 | $ 108,396,340 | $ 62,500,000 | $ 131,880,720 | $ 37,500,000 | $ 160,453,060 | $ 225,000,000 | $ 489,824,010 |
| Mobility & TSMO: | $ 25,000,000 | $ 35,637,550 | $ 25,000,000 | $ 43,358,530 | $ 25,000,000 | $ 52,752,290 | $ 25,000,000 | $ 64,181,220 | $ 100,000,000 | $ 195,929,590 |
| Totals: | $ 200,000,000 | $ 285,100,440 | $ 200,000,000 | $ 346,868,280 | $ 200,000,000 | $ 422,018,300 | $ 200,000,000 | $ 513,449,780 | $ 800,000,000 | $ 1,567,436,800 |

# Appendix G - Performance Management Plan

The Moving Ahead for Progress in the 21st Century Act (MAP-21) requires that all MPOs must transition to a performance-driven, outcome-based program. This Performance Management Plan (PMP) is a component of the Lexington Area MPO's MTP and TIP. State DOTs and MPOs are required to report their progress to the appropriate federal agencies on a regular basis. States are required to report every two years and MPOs are required to report every four years during their Federal Certification Review.

## National Performance Goals & Measures

National performance goals have been established for seven key areas and states are required to establish performance targets in support of these national goals. The MTP's project scoring matrix (Appendix D) was based on both federally-defined planning factors, locally-specific goals established by the MPO, and nationally mandated transportation system performance measures. The numeric project scores helped indicate the project's ability to accomplish MTP goals, to achieve national performance goals, and provides a comparative level of importance in relation to other projects. The relationship of MTP project selection criteria and national goals are summarized below. The result is that projects that score higher and will best achieve these performance goals are programmed within the MTP and TIP.

***Relationship of 2045 MTP project selection criteria to National Performance Goals & Measures***

| MAP-21 Goal Area | National Performance Goal | National Performance Measure | Related MPO Scoring Criteria (see Appendix D) |
|---|---|---|---|
| **Safety** | To achieve a significant reduction in traffic fatalities and serious injuries on all public roads | PM 1 Subpart B (Highway Safety) | A1, A2, A3, A4 & A5 |
| **Infrastructure condition** | To maintain the highway infrastructure asset system in a state of good repair | PM 2 Subpart C & D (Pavement & Bridges) | A3, A4, A5 & D9 |
| **Congestion reduction** | To achieve a significant reduction in congestion on the National Highway System | PM 3 Subpart G* (Traffic Congestion) | D1, D2, D3, D4, D6, D7, D8, G1 & G2 |
| **System reliability** | To improve the efficiency of the surface transportation system | PM 3 Subpart E & F (System Performance) | D1, D2, D3, D4, D5, D6, D7 & D8 |
| **Freight movement and economic vitality** | To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development | PM 3 Subpart F (Freight) | C3, D4, E1, E2, E3, E4 & E5 |
| **Environmental sustainability** | To enhance the performance of the transportation system while protecting and enhancing the natural environment | PM3 Subpart H* (Mobile Source Emissions) | A4, B1, B2, C2, D1, F2, F3, F4, G1, G2 & H2 |
| **Reduced project delivery delays** | To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices | | I1, I2, I3, I4, I5, I6 & J1 |

## FHWA-Required Measures

The Lexington Area MPO must report progress on the following Transportation Performance Measures (TPMs) as required by the Federal Highway Administration (FHWA) per 23 CFR Part 490. The MPO is required to either establish performance targets for each of these TPMs, or to support the KYTC's state targets. The Lexington Area MPO elected to support the state targets.

**PM 1 (Subpart B): SAFETY**

- PM 1.1: Number of Fatalities
- PM 1.2: Number of Serious Injuries
- PM 1.3: Fatality Rate / 100 M VMT
- PM 1.4: Serious Injury Rate / 100 M VMT
- PM 1.5: Number of Non-Motorized Fatalities and Serious Injuries

**PM 2 (Subpart C & D): ASSET MANAGEMENT**

- PM 2.1: Percent of Interstate in Good Condition
- PM 2.2: Percent of Interstate in Poor Condition
- PM 2.3: Percent of Non-Interstate NHS in Good Condition
- PM 2.4: Percent of Non-Interstate NHS in Poor Condition
- PM 2.5: Percent of NHS Bridges in Good Condition
- PM 2.6: Percent of NHS Bridges in Poor Condition

**PM 3 (Subpart E & F): SYSTEM PERFORMANCE**

- PM 3.1: Percent of Reliable Interstate Miles Traveled
- PM 3.2: Percent of Reliable Non-Interstate (NHS) Miles Traveled
- PM 3.3: Interstate Truck Travel Time Reliability Index

## FTA-Required Measures

The Lexington Area MPO must also report progress on the following Transit Asset Management (TAM) measures as required by the Federal Transit Administration (FTA). The MPO worked in coordination with local transit agencies to adopt TAM targets.

**TRANSIT ASSET MANAGEMENT**

- FTA 1.1: Percent of Non-Revenue Service Vehicles Exceeding ULB
- FTA 1.2: Percent of Revenue Vehicles Exceeding ULB
- FTA 1.3: Percent of Facilities Rated Under 3.0 on the TERM Scale

## PM 1: SAFETY

### National Performance Measures for Safety

On February 27, 2019, the Lexington Area MPO's Transportation Policy Committee adopted a resolution to support the KYTC's Safety Performance Targets to achieve a significant reduction in the traffic fatalities and serious injuries on all public roads. In doing so, the MPO agrees to pursue and program projects that will help achieve these targets. To that end, the MPO's criteria for prioritizing projects adds weight to projects on corridors with critical crash rates, collision histories and bicycle and pedestrian safety concerns.

The KYTC now establishes annual baselines and targets for safety. The MPO will track data for these criteria and monitor the area's contribution to achieving the State's targets. Below are the current local targets and a comparison of the MPO's standing in relation to the statewide totals. As a point of comparison, the combined populations of Fayette and Jessamine Counties represent 8.2% of the total statewide population.

### *Transportation Performance Safety Targets*

| | Statewide | | LexMPO | |
|---|---|---|---|---|
| | Baseline: 5-Yr Avg. (2013 – 17) | Target: 5-Yr Avg. (2015-19) | Baseline: 5-Yr Avg. (2013 – 17) | % of Statewide Baseline |
| **PM 1.1: Number of Fatalities** | 737.4 | 737 | 38.2 | 5.2% |
| **PM 1.2: Number of Serious Injuries** | 3124.8 | 2991 | 210.4 | 6.7% |
| **PM 1.3: Fatality Rate / 100 M VMT** | 1.521 | 1.5 | 0.42 | |
| **PM 1.4: Serious Injury Rate / 100 M VMT** | 6.451 | 6.07 | 2.36 | |
| **PM 1.5: Non-Motorized Fatalities & Serious Injuries** | 277.8 | 276 | 31.2 | 11.2% |

*Source: Kentucky Transportation Cabinet. Updated: April 2019.*

#### Notes Regarding Safety Targets

- **Five-Year Rolling Average:** Each target is based on a 5-year rolling average, which is the average of five individual, consecutive points of data. This provides a better understanding of the overall data over time without eliminating years with significant increases or decreases.
- **Fatalities:** The number of fatalities on Kentucky's public roads has been increasing the past four years, after a historically low number of fatalities in 2013. The FY 2019 target represents a *reduction* in total fatalities in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.
- **Serious Injuries:** This target represents a *reduction* in total serious injuries in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.
- **Fatality Rate:** This target represents a *reduction* in the fatality rate in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.
- **Serious Injury Rate:** This target represents a *reduction* in the serious injury rate in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.
- **Non-Motorized Fatalities and Serious Injuries:** This target represents a *reduction* in total non-motorized fatalities and serious injuries in calendar years 2018 and 2019 as compared to calendar years 2016 and 2017.

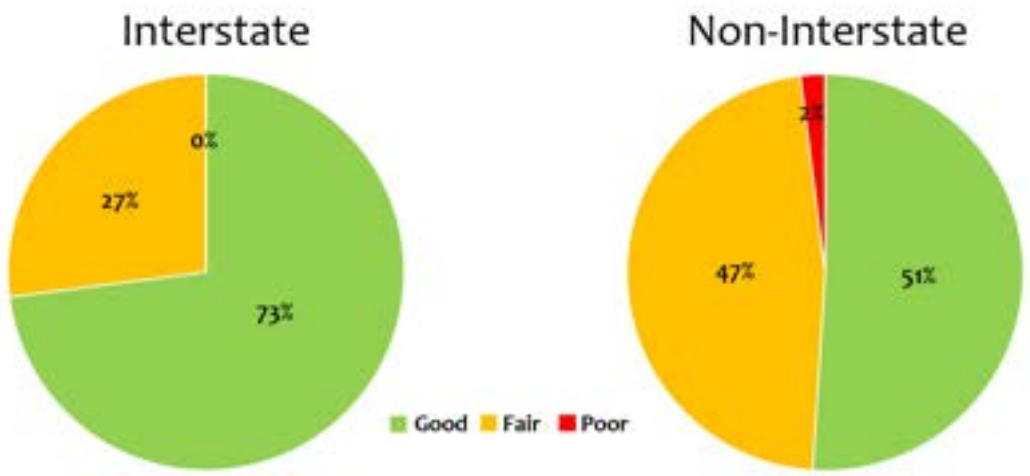
## PM 2: ASSET MANAGEMENT

### National Performance Measures for Infrastructure Condition

FHWA established performance measures for State DOTs to use in managing pavements and bridges on the National Highway System (NHS). The "National Performance Management Measures: Assessing Pavement and Bridge Condition for the National Highway Performance Program Final Rule" addresses federal requirements for State DOTs to set performance targets for pavements and bridges on interstates and non-interstate roadways that are part of the NHS.

KYTC established their required targets by May 20, 2018. The Lexington Area MPO elected to accept and support the KYTC-adopted performance targets in October 24, 2018. This means the Lexington Area has agreed to plan and program projects so that they contribute toward the accomplishment of the state's infrastructure performance measure targets. KYTC uses the Highway Performance Monitoring System to evaluate and categorize the roads as either good, fair or poor. In the Lexington Area, 73% of interstate pavement is in good condition and 27% is in fair condition. Two percent of non-interstate roadways on the National Highway System are in poor condition. A good condition suggests no major improvement is needed and poor condition suggests major reconstruction investment is needed.

### *Lexington Area MPO Pavement Quality*




### *National Performance Measures for Infrastructure Condition*

| | KYTC Target (2018) | | LexMPO |
|---|---|---|---|
| | 2 Year | 4 Year | Baseline (2018) |
| **PM 2.1: % of Interstate in Good Condition** | 50.0% | 50.0% | 73.0% |
| **PM 2.2: % of Interstate in Poor Condition** | 3.0% | 3.0% | 0.1% |
| **PM 2.3: % of Non-Interstate NHS in Good Condition** | 35.0% | 35.0% | 51.0% |
| **PM 2.4: % of Non-Interstate NHS in Poor Condition** | 6.0% | 6.0% | 1.9% |
| **PM 2.5: % of NHS Bridges in Good Condition** | 35.0% | 35.0% | 24.0% |
| **PM 2.6: % of NHS Bridges in Poor Condition** | 3.7% | 3.2% | 1.0% |

*Source: Kentucky Transportation Cabinet. Updated: October 2018.*

## PM 3: SYSTEM PERFORMANCE

### National Measures for System Performance

The federal rule requires that the Level of Travel Time Reliability (LOTTR) be used to assess the performance of the roadway system. Travel Time Reliability measures the consistency of travel time for the same trip measured day-to-day or across different times of the day. If trip times are inconsistent the travel time is considered unreliable. This means that travelers must plan for these problems by leaving earlier to avoid being late, leading to time wasted.

LOTTR is defined as the ratio of the longer travel times (80$^{th}$ percentile) to a "normal" travel time (50$^{th}$ percentile), using data from FHWA's National Performance Management Research Data Set (NPMRDS) or equivalent. A roadway segment would meet travel time expectations when the calculated value of the travel time reliability is less than 1.50.

KYTC established their required system performance targets by May 20, 2018. The Lexington Area MPO elected to accept and support the KYTC-adopted performance targets on October 24, 2018. This means the MPO has agreed to plan and program projects so that they contribute toward the accomplishment of the KYTC's system performance measure targets.

### *National Measures for System Performance*

| | KYTC Target | | Lex MPO |
|---|---|---|---|
| | 2 Year | 4 Year | Baseline (2016) |
| **PM 3.1: % of Reliable Interstate Miles Traveled** | 93.0% | 93.0% | 100.0% |
| **PM 3.2: % of Reliable Non-Interstate (NHS) Miles Traveled** | | 82.5% | 75.1% |
| **PM 3.3: Interstate Truck Travel Time Reliability Index** | 1.2 | 1.2 | 1.13 |

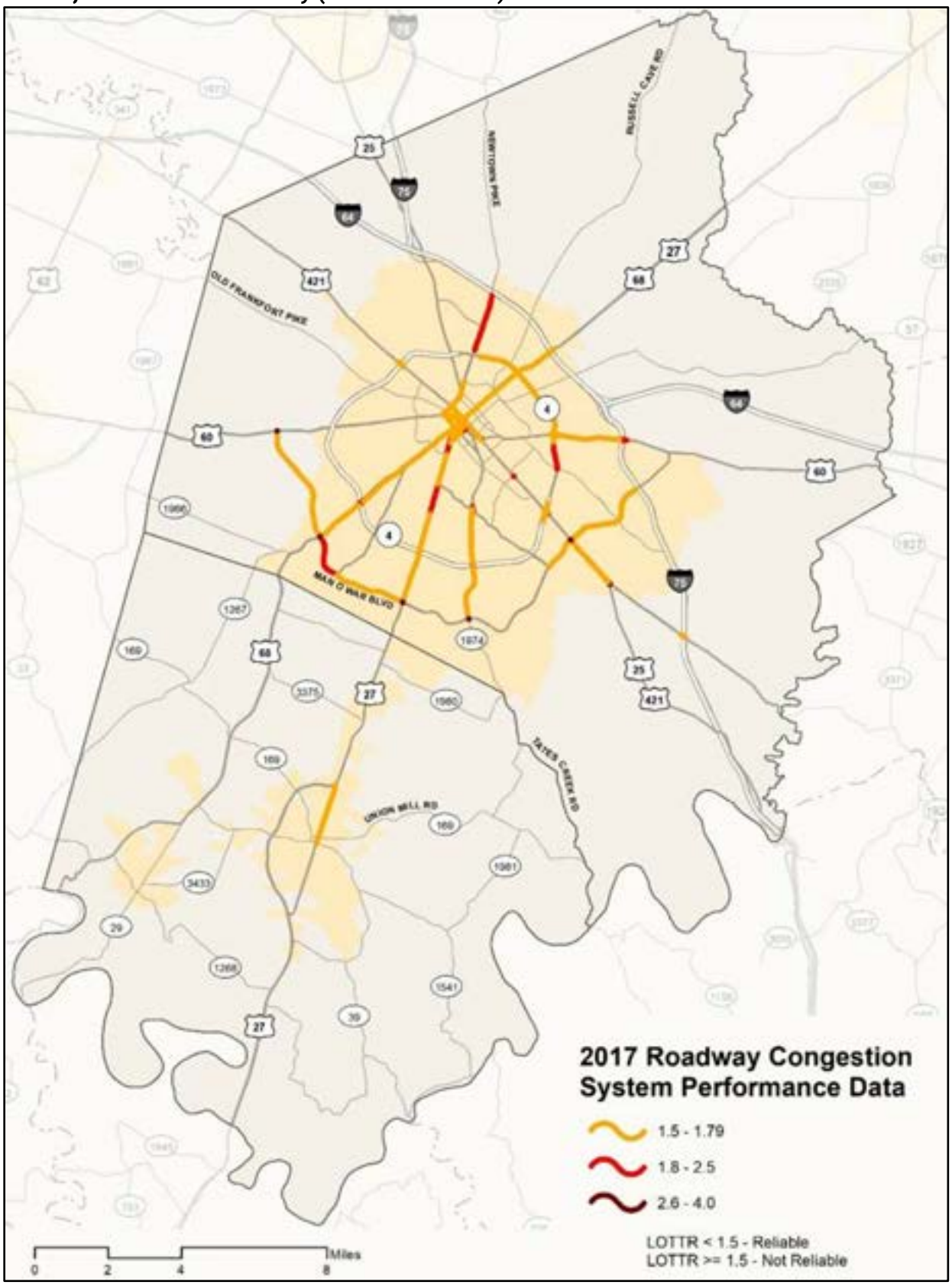
*Source: Kentucky Transportation Cabinet. Updated: October 2018.*

The travel time reliability for interstates and roadways on the NHS in the Lexington Area are shown in the tables and maps below as well as the truck travel time reliability for the Lexington Area and statewide.

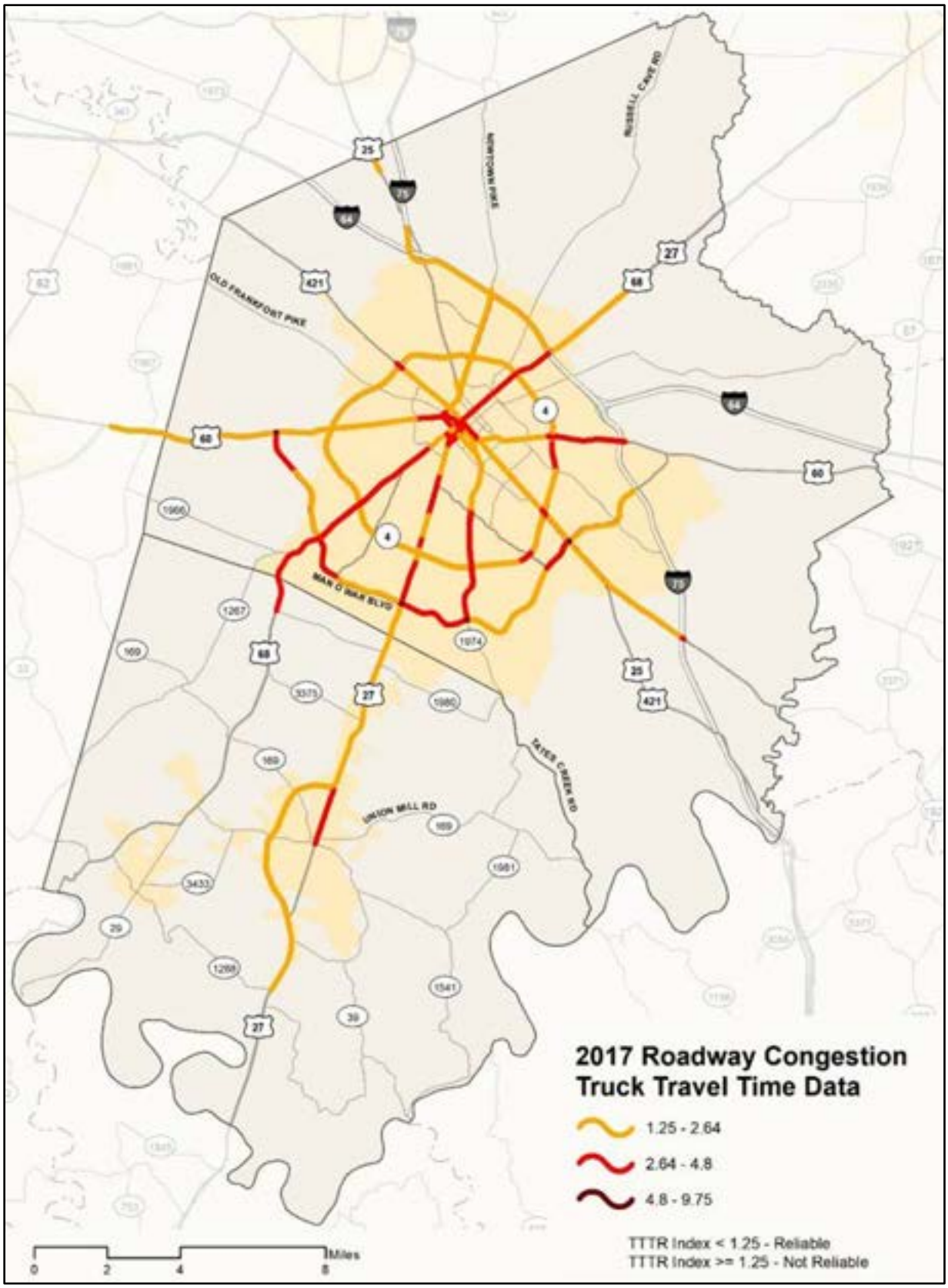
***Travel Time Reliability:***



***Level of Travel Time Reliability (Interstate & NHS)***



***Truck Travel Time Reliability***



## Transit Asset Management:

### National Performance Measures for Transit Asset Management

Lextran has established Transit Asset Management (TAM) targets in accordance with Federal regulations enacted through MAP-21 for performance measures and target setting. In July 2016, the Federal Transit Administration (FTA) issued a final rule requiring recipients of FTA funds to maintain and document minimum Transit Asset Management (TAM) standards. On October 24, 2018, the Lexington Area MPO's Transportation Policy Committee adopted and approved a resolution concurring with and supporting the performance targets for Lextran and BUS as outlined in their TAM plans. The MPO agrees to plan and program projects so that they contribute toward the accomplishment of those targets.

### *Lextran and BUS Transit Asset Management Targets*

| | 2018 Actual | 2019 Target |
|---|---|---|
| **FTA 1.1: % of Non-Revenue Service Vehicles Exceeding ULB** | 9% | 20% |
| **FTA 1.2: % of Revenue Vehicles Exceeding ULB** | 31% | 40% |
| **FTA 1.3: % of Facilities Rated Under 3.0 on the TERM Scale** | 0% | 0% |

*Source: Lextran and Lexington Area MPO*

# Appendix H - Abbreviations & Acronyms

5303 – FTA – Metropolitan Transportation Planning Program
5307 – FTA – Urbanized Area Formula Program
5309 – FTA – New Starts
5310 – FTA – Enhanced Mobility of Seniors and Individuals with Disabilities
5311 – FTA – Rural Areas Formula Program
5339 – FTA – Bus and Bus Facility Formula
ADA – Americans with Disabilities Act of 1990 and ADA Amendments Act of 2008
AM – Access Management
AVs/CVs – Autonomous Vehicles and Connected Vehicles
BGADD – Bluegrass Area Development District
BGCAP – Bluegrass Community Action Partnership
BPAC – the MPO Bicycle and Pedestrian Advisory Committee
BPMP – Bicycle and Pedestrian Master Plan
BRT – Bus Rapid Transit
BUS – Bluegrass Ultra Transit Service
CAAA – Clean Air Act Amendment of 1990
CCR – Critical Crash Rate
CFR – Code of Federal Regulations
CHAF – Continuous Highway Analysis Framework
CMAQ – Congestion Mitigation and Air Quality Improvement
CMC – the MPO Congestion Management Committee
CMP – Congestion Management Process
COA – Comprehensive Operational Analysis
Construction (C) – Project Construction Phase
CR – County Road or Route
CRFC – Critical Rural Freight Corridors
CS – City Street
CUFC – Critical Urban Freight Corridors
DOT – U.S. Department of Transportation
DESIGN (D) – Project Design Phase
E + C – existing road network and committed projects
EPA – U. S. Environmental Protection Agency
FAST Act – Fixing America's Surface Transportation Act of 2015
FHWA – Federal Highway Administration
FTA – Federal Transit Administration
FTSB – Federated Transportation Services of the Bluegrass
FY – Fiscal Year
GHG – Greenhouse Gas Emissions
GIS – Geographic Information Systems
GPS – Global Positioning System
HPMS – Highway Performance Monitoring System
HSIP – Safety – Highway Safety Improvement Program
HUD – U.S. Department of Housing and Urban Development
ITN of the Bluegrass – An affiliate of the Independent Transportation Network America

ITS – Intelligent Transportation Systems
JARC – Jobs Access and Reverse Commute
KYTC – Kentucky Transportation Cabinet
LEED – Leadership in Energy and Environmental Design
LEP – low English proficiency
LFUCG – Lexington Fayette Urban County Government
LOTTR – Level of Travel Time Reliability
MAAS or MaaS – Mobility as a Service
MAP-21 – Moving Ahead for Progress in the 21st Century Act of 2012
MPO – Metropolitan Planning Organization
MSA – Metropolitan Statistical Area
MTP – Metropolitan Transportation Plan
NAAQS – National Ambient Air Quality Standards
NBI – National Bridge Inventory
NH – Federal National Highway System
NHPP – National Highway Performance Program
NHS – National Highway System
NHTS – National Household Travel Survey
NPMRDS – National Performance Management Research Data Set
NTMP – Neighborhood Traffic Management Program
O & M – Operation and Maintenance
PHMSA – Pipeline and Hazardous Materials Safety Administration
PP – Participation Plan
ROW (R) – Project Right of Way Phase
SHIFT – Strategic Highway Investment Formula for Tomorrow
SHSP – Strategic Highway Safety Plan
SIP – State Implementation Plan (for air pollutants)??
SLX – Surface Transportation Block Grant Program – Lexington
SP – State Construction Program
SPB – State Construction Bonds Program
SPP – State Construction High Priority Projects
STBG – Surface Transportation Block Grant
STIP – Statewide Transportation Improvement Program
STP – Statewide Transportation Plan or Surface Transportation Program
SUP – Shared Use Paths
TAP – Transportation Alternative Program
TAZ – Traffic Analysis Zone
TDM – Travel Demand Model or Transportation Demand Management
TIP – Transportation Improvement Program
TMA – Transportation Management Area (an MPO with a population over 200,000)
TMC – Traffic Management Center
TPC – the MPO Transportation Policy Committee
TPM – Transportation Performance Management
TSP – Transit Signal Pririty
TTCC – the MPO Transportation Technical Coordination Committee
TTI – Travel Time Index??

UPWP – Unified Planning Work Program
UK – University of Kentucky
USC – United States Code
USDOT – United States Department of Transportation
U (Utility) – Project Utility Phase
V/C – Volume to Capacity Ratio
VHT – Vehicle Hours Traveled
VMT - Vehicle Miles Traveled or Vehicle Miles of Travel
VSF – Volume Service Flows
YOE – Year of Expenditure