Appendix C:
Traffic, Highways, and Safety

GET THERE TOGETHER.

Kentucky's Long-Range
Transportation Vision

HIGHWAY SYSTEM OVERVIEW

Kentucky's roads, highways and bridges form vital transportation links for the state's residents, visitors, and businesses, providing daily access to homes, jobs, shopping, natural resources, and recreation. Modernizing Kentucky's transportation system is critical to improve the quality of life and economic competitiveness in the Bluegrass State. Inadequate transportation investment, which will result in deteriorated transportation facilities and diminished safety and access, will negatively affect Kentucky's economic competitiveness and quality of life. To accommodate an increasing population and a vibrant economic competitiveness, Kentucky will need to maintain and modernize its roads, highways, and bridges by improving the physical condition of its transportation network and enhancing the system's ability to provide efficient, reliable, and safe mobility for residents, visitors, and businesses. Making needed improvements to Kentucky's roads, highways, bridges, and transit systems could also provide a significant boost to the state's economy by creating jobs in the short term and stimulating long-term economic growth as a result of enhanced mobility and access.[1]

KYTC manages the eighteenth (18th) largest interstate lane-miles network in the United States. Residents of this 26th most populous state in the nation, commercial vehicles moving goods, and visitors enjoying the many tourist amenities of the state collectively generate funds to help KYTC take care of a network of 80,000+ miles of public roads and 14,000+ bridges, of which 27,620 miles are state maintained highways. In addition to maintaining the roads and bridges, KYTC also maintains and operates support systems and facilities like signs, lights, sidewalks and paths, maintenance facilities, and a fleet of equipment vehicles. KYTC is responsible for maintaining safe and reliable access to destinations for all types of trips, working with partners to ensure requirements are met, and seeking input from citizens and private interests to deliver an integrated multimodal transportation system. KYTC's multimodal transportation system includes:

- 13 freight railroads operate over 2,400 miles of track within the state.[2]
- Currently four Class I's railroads serve Kentucky (BNSF Railway, CSX Transportation, Illinois Central Railroad Corporation, Norfolk Southern and Soo Line Railroad Co.)[3]
- Kentucky's 1,090 miles of commercial navigable waterways comprise one of the most expansive and complex systems in the nation.
- Each year, Kentucky's freight system moves approximately $578 billion worth of freight, the 14th highest rate in the nation.[4]
- • 938 Miles of Bike Lanes on U.S. Routes

[1] "Kentucky Transportation by the Numbers", TRIP, March 2020, p. 3.
[2] Table 1-12: Freight Railroads Operating in Kentucky by Class: 2000, Bureau of Transportation Statistics (bts.gov)
[3] Table 1-12: Freight Railroads Operating in Kentucky by Class: 2000, Bureau of Transportation Statistics (bts.gov)
[4] "Report Ky: A national freight leader, but underfunded transportation could hinder economic growth", Lane Report, October 8, 2019

- Kentucky's transit bus systems provide nearly 30 million passenger trips per year. Nearly 3 million transit trips per year are taken by Kentucky's elderly and disabled populations, providing access to health care and social services.
- 4 passenger rail stations provide passenger rail service in Kentucky by Amtrak.
- Kentucky is home to a strong aviation network that includes 59 public use General Aviation Airports and 6 Commercial Airports.

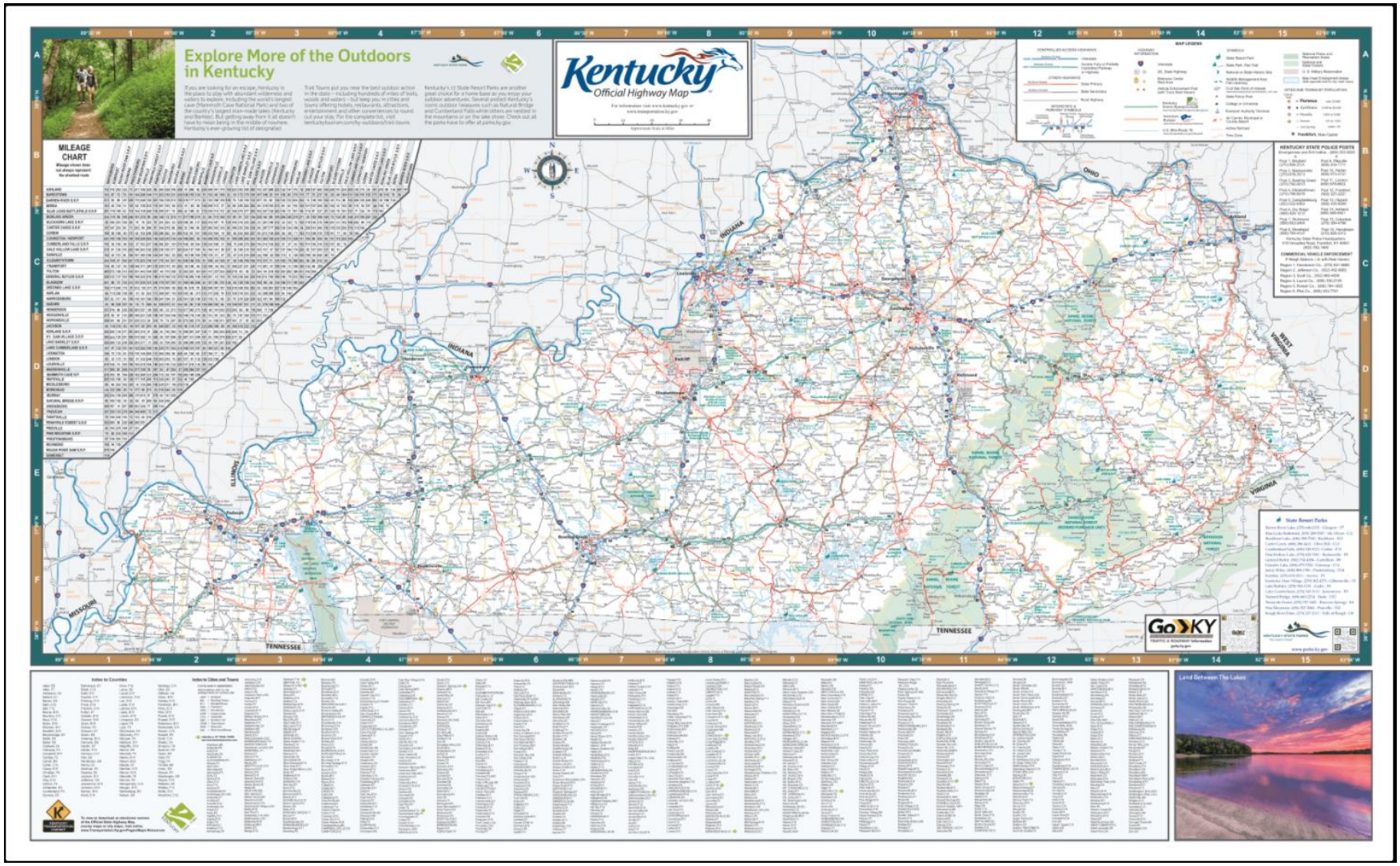
Kentuckians depend on having an efficient, safe, and well-maintained transportation network to provide easy access to work, school, medical offices, grocery stores, sporting events, and other locations. Kentucky motorists and businesses require a high level of personal and commercial mobility. To foster quality of life and spur continued economic growth, it is critical that the state provide a safe and modern transportation system that can accommodate future growth in population, tourism, business, recreation, and vehicle travel. Kentucky's population grew to approximately 4.5 million residents in 2018, an 11 percent increase since 2000.[5] In 2018, the state's transportation system carried 49.5 billion vehicle miles of travel (VMT), a five percent increase from 2013.[6] In the most congested urban areas, drivers lose up to $1,110 and as many as 52 hours per year sitting in congestion. Every year, $578 billion in goods are shipped to and from sites in Kentucky. [7] Sixty-five percent of the goods shipped annually to and from sites in Kentucky are carried by truck and another 13 percent are carried by courier services or multiple-mode deliveries, which include trucking. The value of freight shipped to and from sites in Kentucky, in inflation-adjusted dollars, is expected to increase 114 percent by 2045 and by 65 percent for goods shipped by trucks.[8]

Approximately 907,000 full-time jobs in Kentucky in key industries like tourism, retail sales, agriculture and manufacturing are dependent on the quality, safety, and reliability of the state's transportation infrastructure network.[9]

In support of the flow of goods and people within Kentucky, the state leadership enacts a Highway Plan every two years. The 2020-2026 Highway Plan provided $8.5 billion for over 1,400 projects across the state for the six-year period.[10] The current highway system is shown in Figure 1.

[5] U.S. Census Bureau (2018).
[6] "Kentucky | ASCE's 2021 Infrastructure Report Card." *ASCE's 2021 Infrastructure Report Card* |, 27 Oct. 2016, https://infrastructurereportcard.org/state-item/kentucky/.
[7] "Report Ky: A national freight leader, but underfunded transportation could hinder economic growth", Lane Report, October 8, 2019
[8] "2019 Report Card for Kentucky's Infrastructure", ASCE, p. 58.
[9] Analysis of the Kentucky Statewide Travel Model.
[10] 2020 Highway Plan | KYTC." https://transportation.ky.gov/Program-Management/Pages/2020-Highway-Plan.aspx.

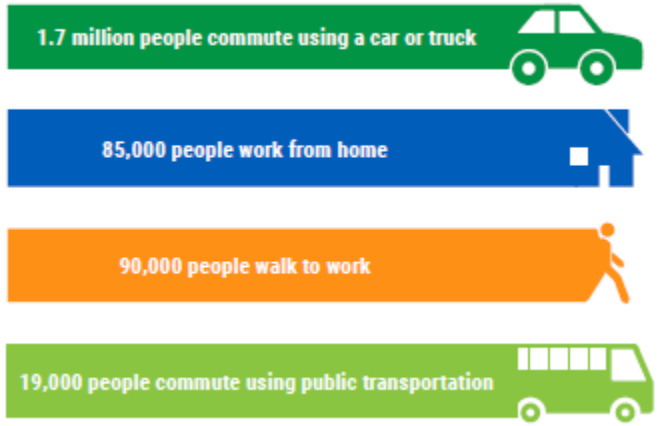
Figure 1: Kentucky's Highway System



Commuting Mode Choice

Integrating and connecting modes begins with an understanding of each mode and its role in moving people and goods statewide. The commute modes shown in Figure 2 are based on the percentage of workers aged 16 years and up who commute by bicycle; by private vehicle, including car, truck, van, taxicab, and motorcycle; by public transportation, including bus, rail, and ferry; and by foot.

Figure 2: Commute Modes



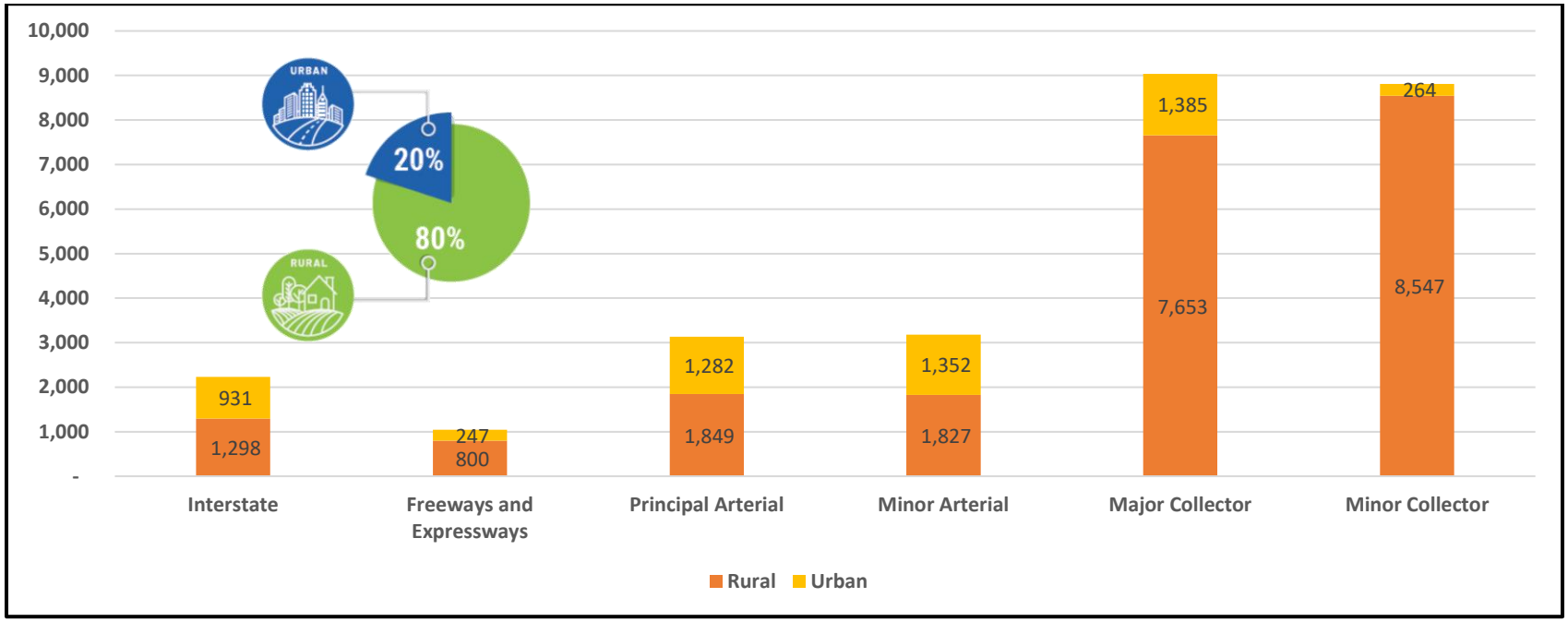
Source: Kentucky Census Data

Centerline Miles by Functional Class

There are over 80,000 miles of public roads in Kentucky. About 20 percent of those are in urban areas, and 80 percent are rural. Approximately half of all public roads are maintained by individual county governments, and about one-third are maintained by the state. Another 13 percent are maintained by city/municipal governments, and the remaining 2 percent are owned and maintained by other federal, state, and local agencies. Figure 2 shows public Kentucky roadways by functional class. Most of the public roadways (about 57,000 miles) are classified as "local". Figure 3 shows centerline miles for roadways other than "local" by functional class.[11]

[11] Travel time conditions on any given roadway segment considered "reliable" if the daily volume-to-capacity ratio is less than 60%. This measure was developed in consultation with KYTC staff.

Figure 3: 2018 Centerline Miles by Functional Class



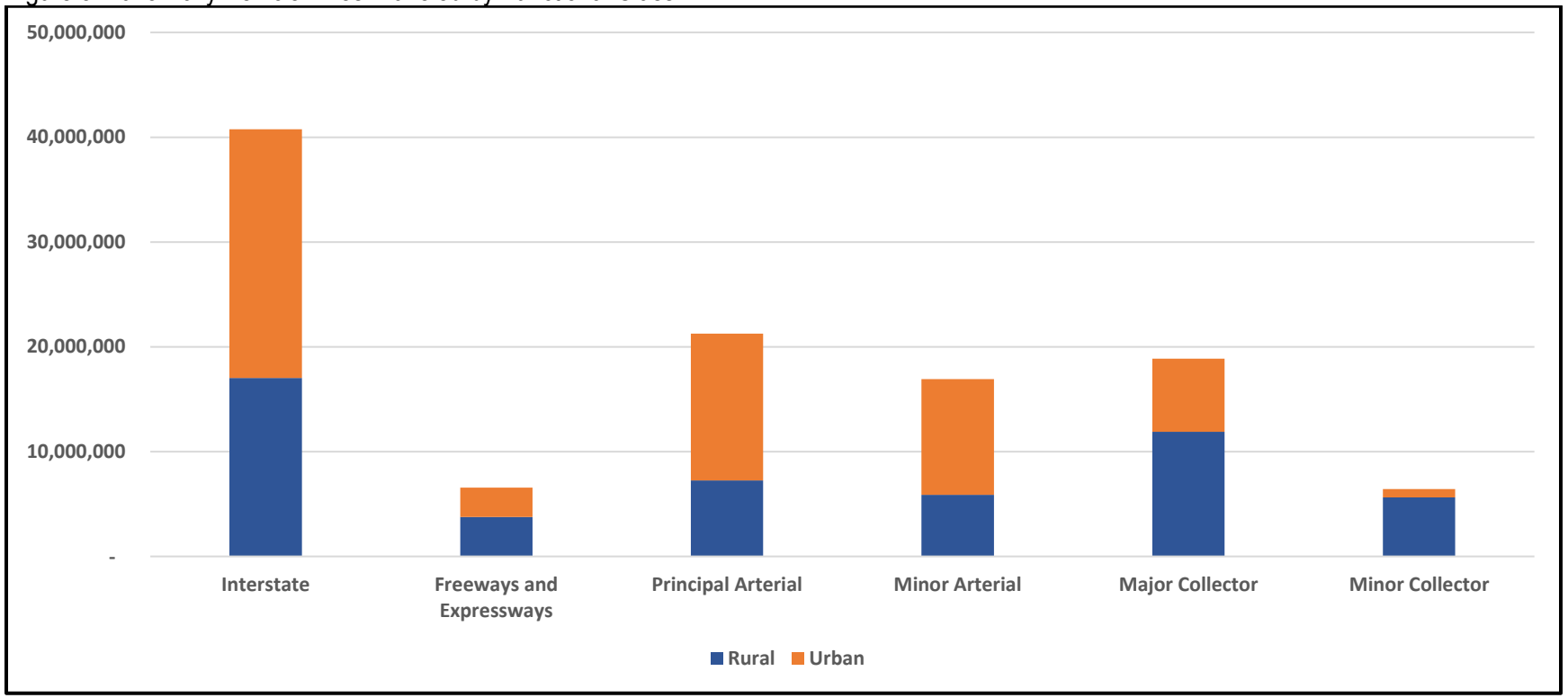
Source: Kentucky Statewide Travel Model

Figure 4: Roadways by Functional Class

Vehicle-Miles Traveled

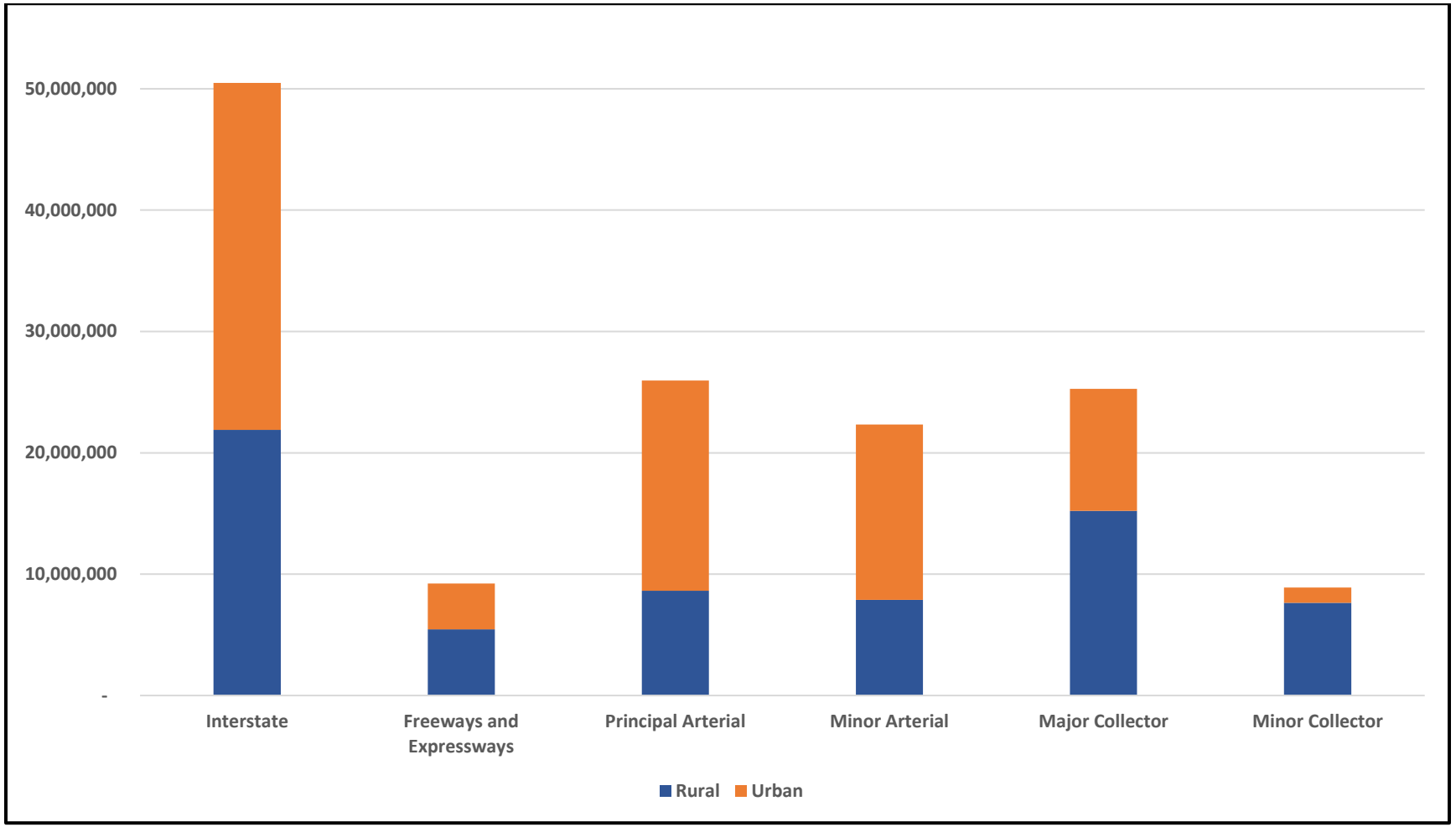
Figure 5 and Figure 6 present 2018 and 2045 estimated VMT by roadway functional class on all non-local roadways. Despite interstates comprising less than 10 percent of roadway mileage, they represent the largest portion of total VMT at 36-37 percent. The second most-traveled non-local functional class is principal arterials (34 percent) which comprise 23 percent of the roadways. Major roads in urban population centers carry the highest traffic volume. Between 2018 and 2045, non-local daily VMT for all roadway classes is forecast to increase from 110.8 million to 142.2 million, an increase of 28 percent.

Figure 5: 2018 Daily Vehicle-Miles Traveled by Functional Class



Source: Kentucky Statewide Travel Model

Figure 6: 2045 Daily Vehicle-Miles Traveled by Functional Class

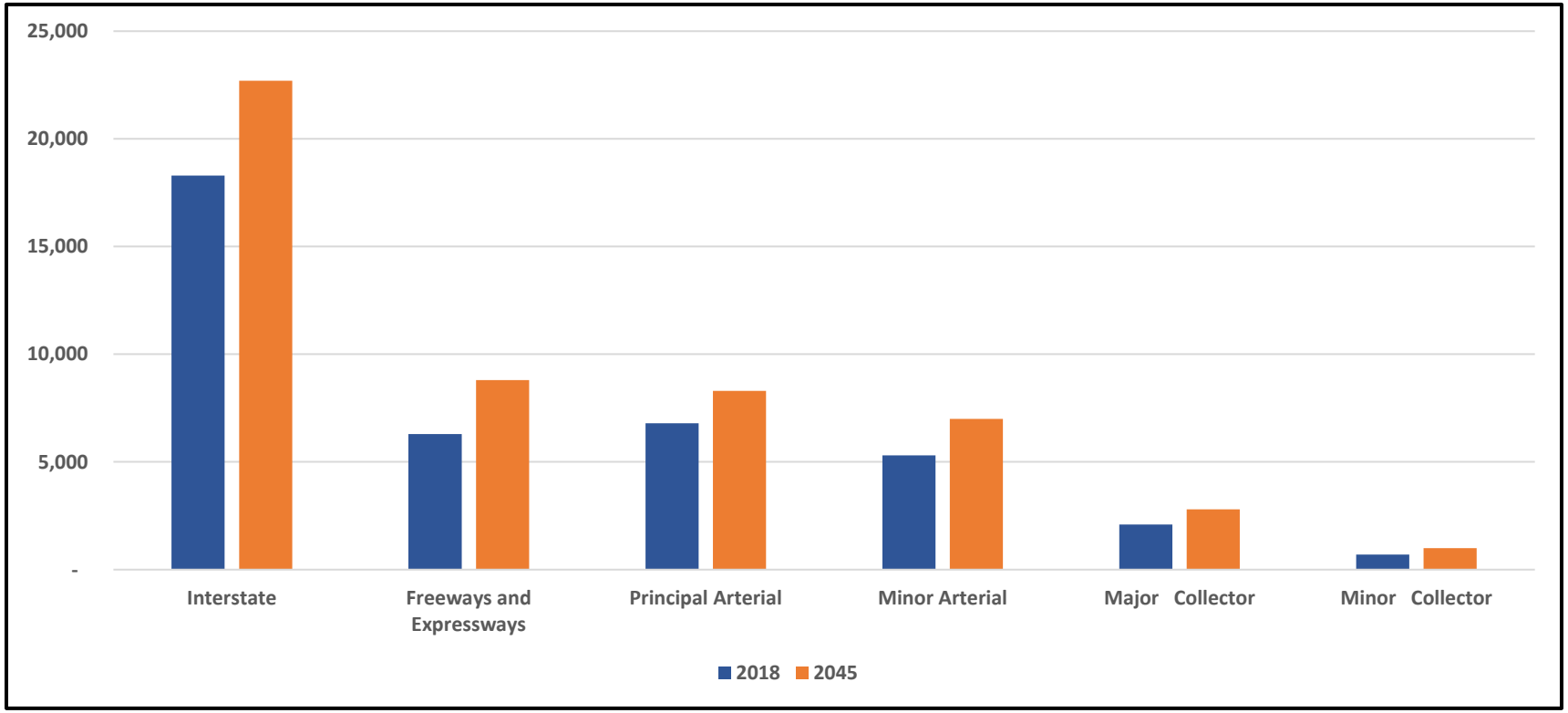


Source: Kentucky Statewide Travel Model

Annual Average Daily Traffic (AADT)

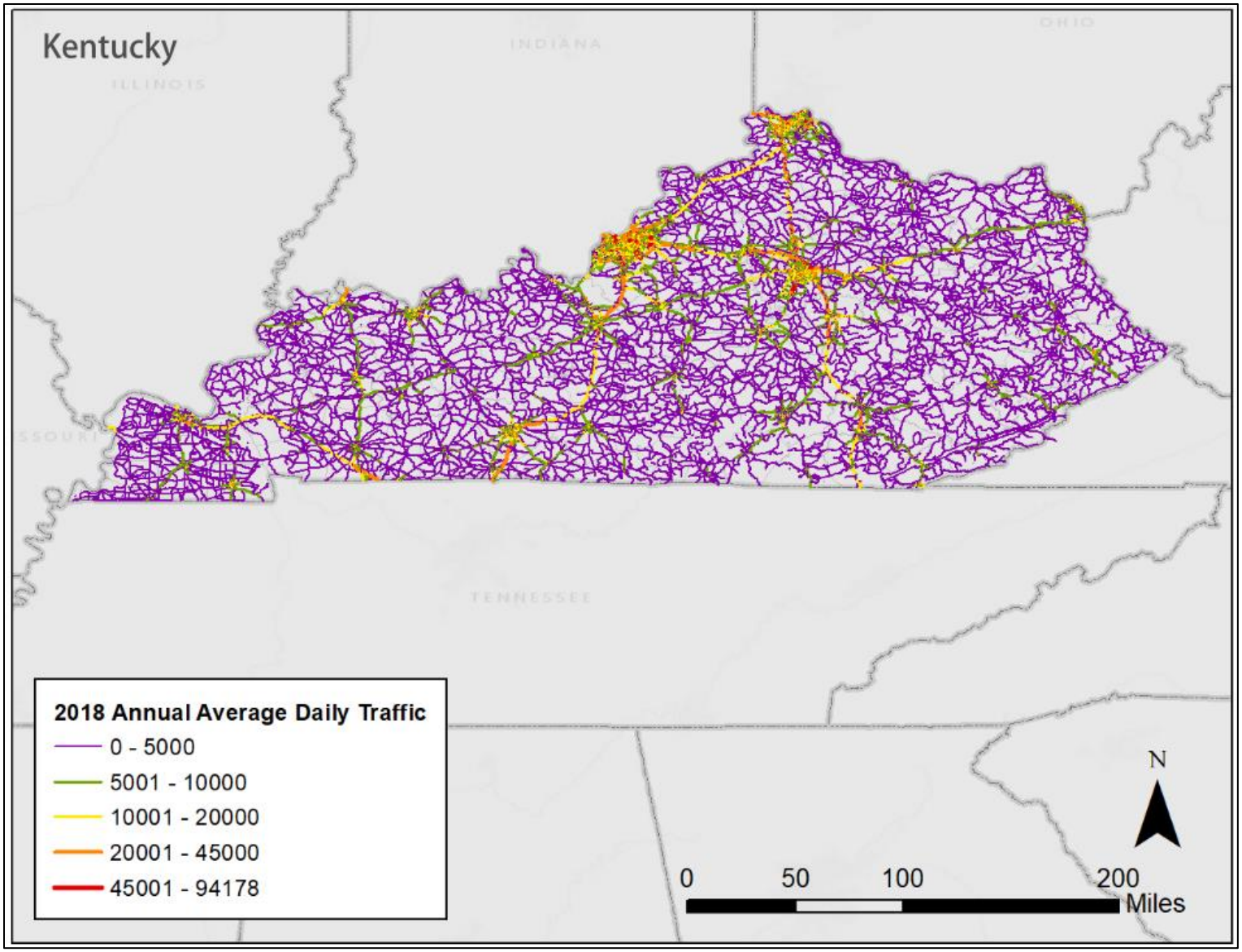
Related to VMT, the average roadway segment AADT by functional class is shown in Figure 7 for years 2018 and 2045 as estimated by the Kentucky Statewide Travel Model. Estimates indicate a 20-40% increase in average roadway segment AADT in from 2018 to 2045, depending on roadway functional class. Along with vehicle classification and weight, AADT is a key measure for pavement wear and serves as a basis for traffic capacity assessment. Notably, in reporting annual averages, this data does not reflect traffic volume seasonality which substantially impacts driver experience between peak and off-peak times. The map in Figure 8 shows 2018 AADT estimates statewide.

Figure 7: Annual Average Daily Traffic by Functional Class



Source: Kentucky Statewide Travel Model

Figure 8: 2018 Annual Average Daily Traffic

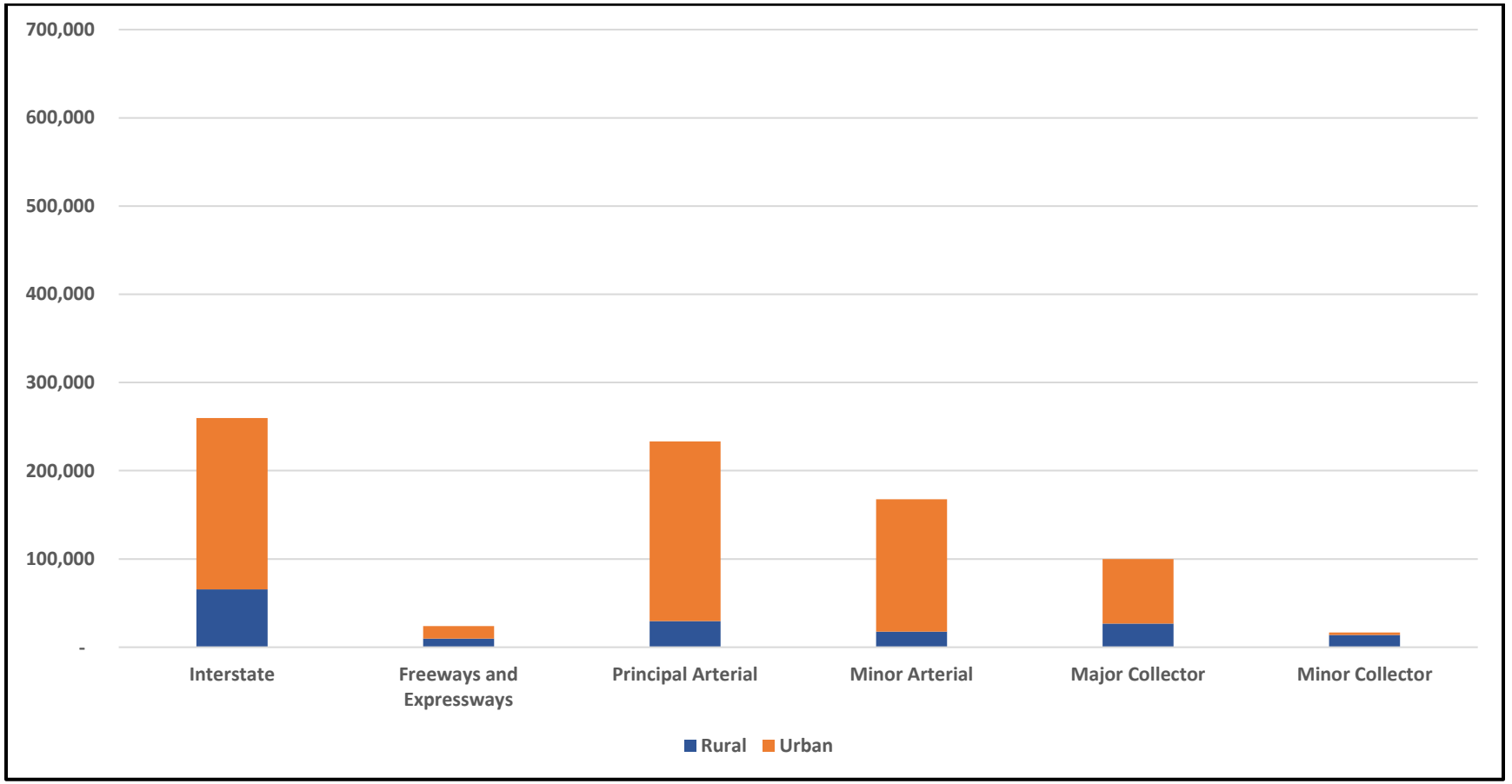


Source: Kentucky Statewide Travel Model

Vehicle Delay

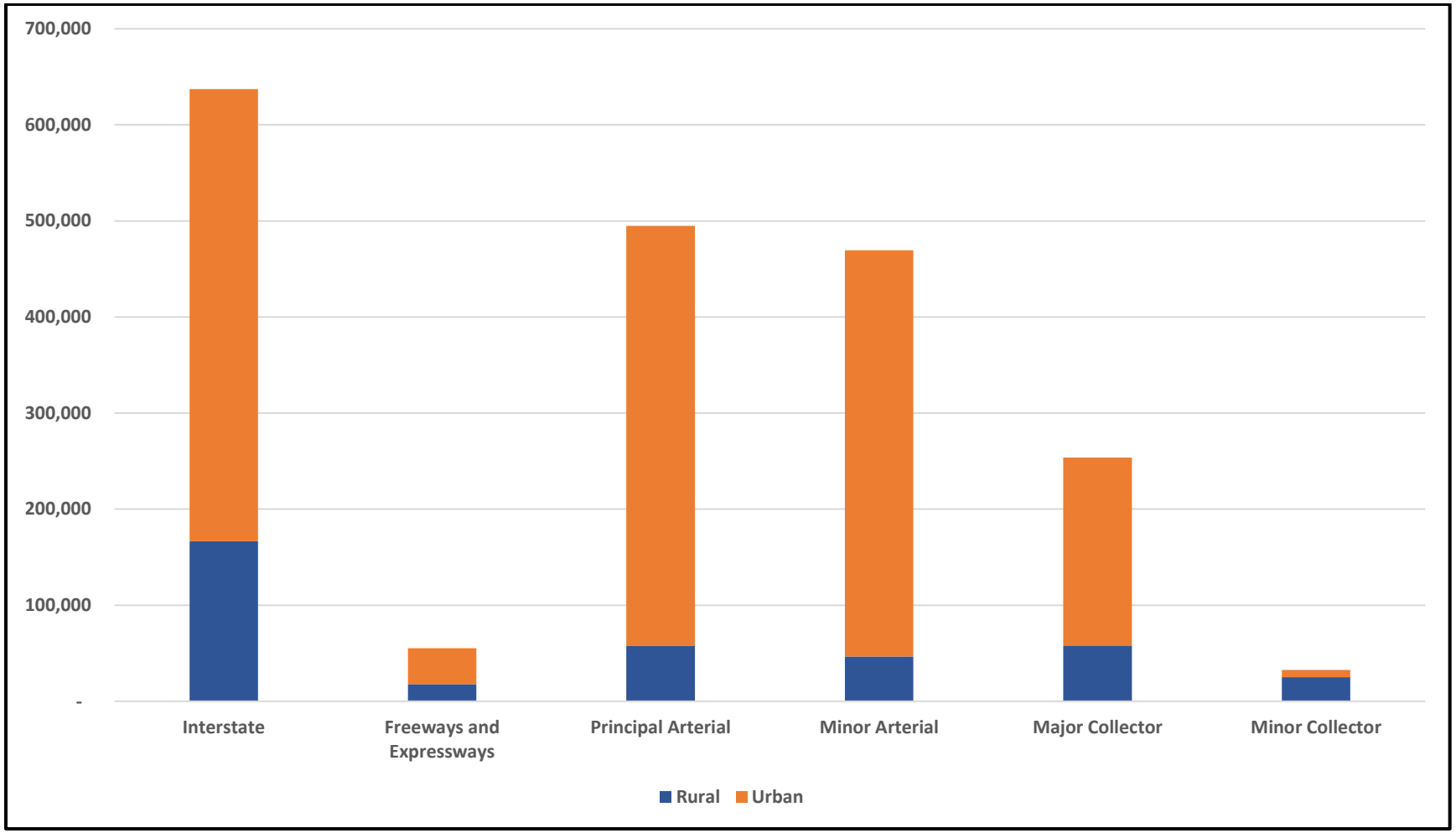
Delay is the additional travel time required due to congestion, both reoccurring and non-reoccuring. Figure 9 and Figure 10 present 2018 and 2045 estimated delay by roadway functional class on all non-local roadways. Interstates and principal arterials experience the most delay, with delay even more pronounced on interstates in the future. Total delay is forecasted to increase by 142% from 2018 to 2045. Most of the delay increase occurs in the urban areas of Kentucky and on interstate facilities. The fraction of total delay contributed by urban areas in 2018 and 2045 remains constant at 80%.

Figure 9: 2018 Daily Delay Hours by Functional Class



Source: Kentucky Statewide Travel Model

Figure 10: 2045 Daily Delay Hours by Functional Class



Source: Kentucky Statewide Travel Model

Table 1 highlights the contribution of urban areas to delay by showing the number of hours lost annually for each driver in the Commonwealth's largest urban areas.

Table 1: Annual Hours of Congestion Delay per Driver.[12]

Location	Hours Lost
Bowling Green	36
Lexington	37
Louisville	46
Northern Kentucky	52
Owensboro	15

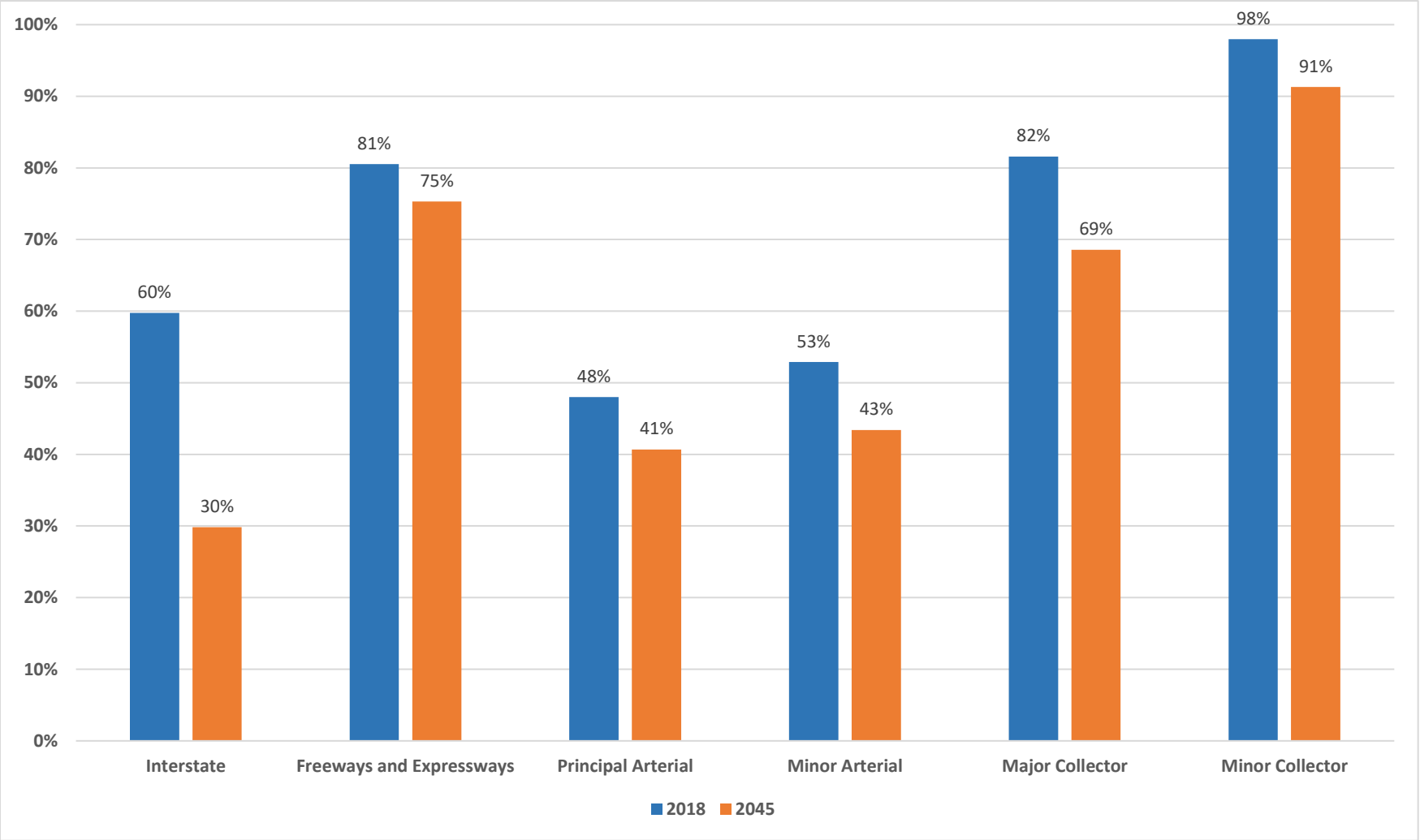
Source: TTI Urban Mobility Report

Travel Time Reliability

Travel time reliability is a measure of how consistent or dependable travel times are. Travel time reliability can be measured either from day to day or across different times of day, or both. If trip times are inconsistent, travel time is considered unreliable, because it is difficult to estimate consistently and accurately. Recurrent congestion, or delay due to recurrent congestion, contribute to travel time unreliability. As congestion or delay increases, travel times become less reliable. Figure 11 shows the relative reliability of Kentucky's transportation network in 2018 and 2045 using the congestion level estimated by the Statewide Travel Model as a proxy for measuring reliability.[13] Note that relative reliability across functional classes has an inverse relationship to the level of delay depicted in Figure 9 and Figure 10. Interstates and principal arterials experience the most delay and they are the least reliable. Generally, as delay increases in 2045 relative to 2018, so does the travel time reliability of the transportation network. Interstates suffer the greatest reduction in reliability.

[12] "Kentucky Transportation by the Numbers", TRIP, March 2020, p. 11.
[13] Travel time conditions on any given roadway segment considered "reliable" if the daily volume-to-capacity ratio is less than 60%. This measure was developed in consultation with KYTC staff.

Figure 11: Percentage of Reliable Daily Vehicle-Miles Traveled by Functional Class

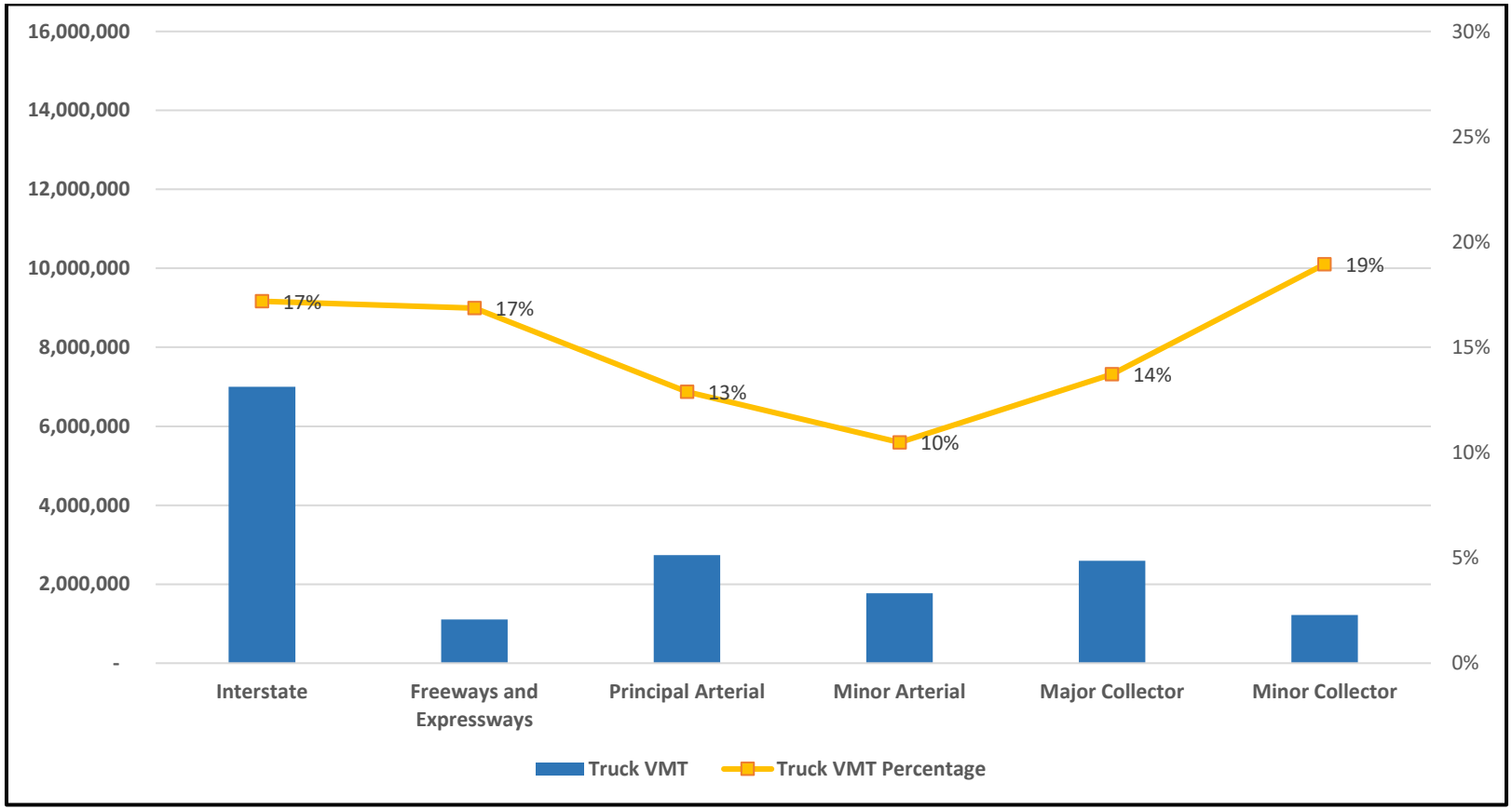


Source: Kentucky Statewide Travel Model

Truck Traffic

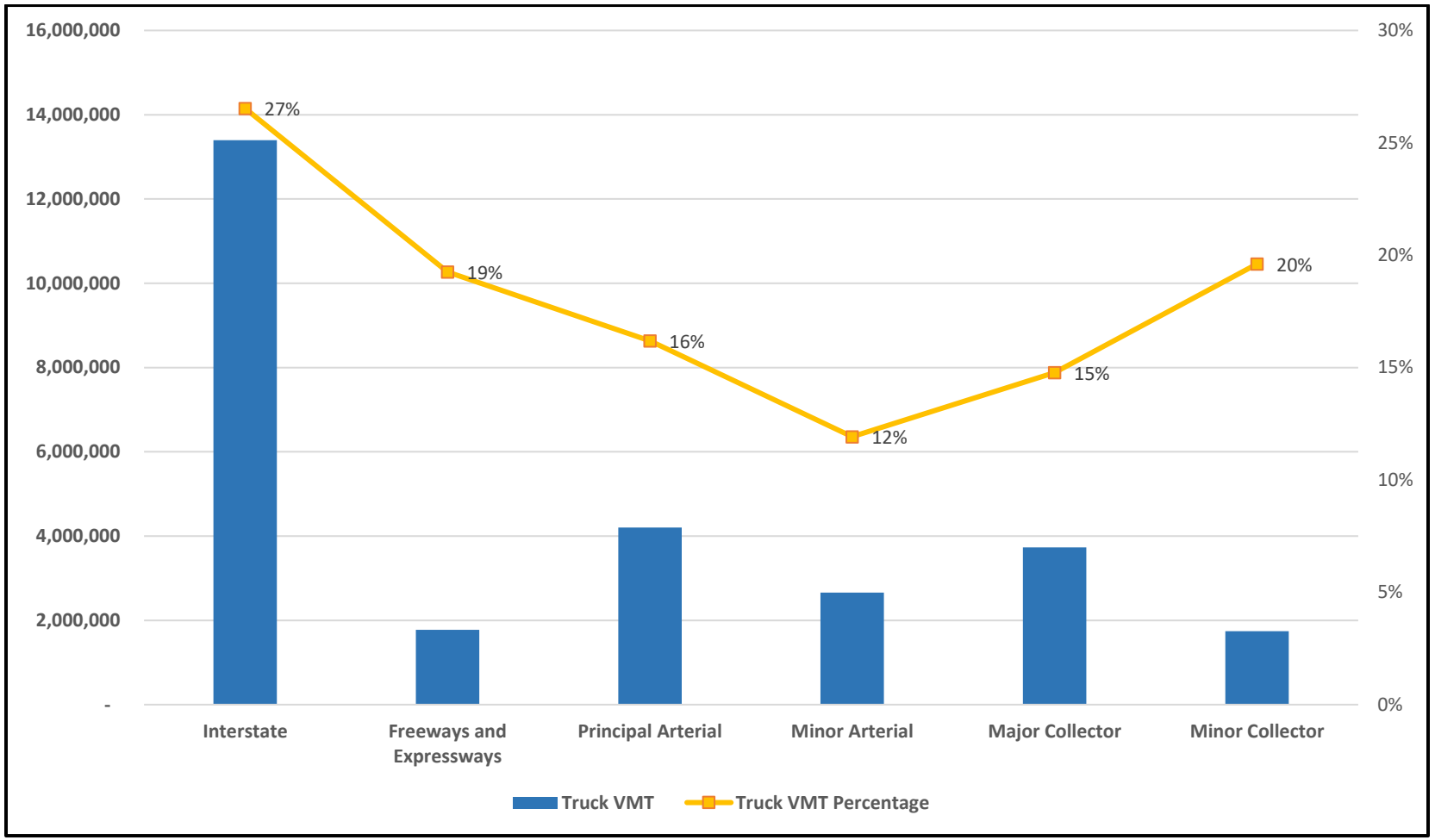
The Kentucky Statewide Travel Model provides truck VMT and percentage estimates for 2018 and 2045. Figure 12 demonstrates in 2018, higher functional roadway classes generally carry more single-unit and combination trucks—over 9.7 million daily VMT on interstate and principal arterial roadways. However, trucks make up an equal or higher proportion of traffic on lower class roadways, with up to 19 percent on minor collectors. Truck VMT increases 67% for all non-local roadways moving from a VMT of just over 16.4 million in 2018 to 27.5 million in 2045. As Figure 13 shows, there are generally increases in VMT over all the roadway classes. Interstate truck VMT increases the most, by 90% in 2045 resulting in a truck VMT percentage of 27%.

Figure 12: 2018 Daily Truck VMT and Percentage by Functional Class



Source: Kentucky Statewide Travel Model

Figure 13: 2045 Daily Truck VMT and Percentage by Functional Class



Source: Kentucky Statewide Travel Model

Development Density

The Kentucky Statewide Travel Model was used to extract socioeconomic data for the state to establish anticipated changes in development patterns from 2015 to 2045. Development density, based on both population and employment, was determined for each county, and is shown in Figure 14. This map reflects pronounced reductions in population and employment in eastern Kentucky and increases for both in the I-65 and I-64 corridors. Also, healthy increases in development are anticipated in the Louisville and Lexington metro areas, as well as the Cincinnati suburbs.

Roads And Economic Development

Closely related to the Development Density maps is the Road Quality for Kentucky Rural Economic Development map shown in Figure 15. This map shows which counties have access to interstates and parkway. In Kentucky 39 counties have access to neither an interstate or parkway. All but three of those counties are shown as having decreased development density by 2045.

Figure 14: Changes in Development Density

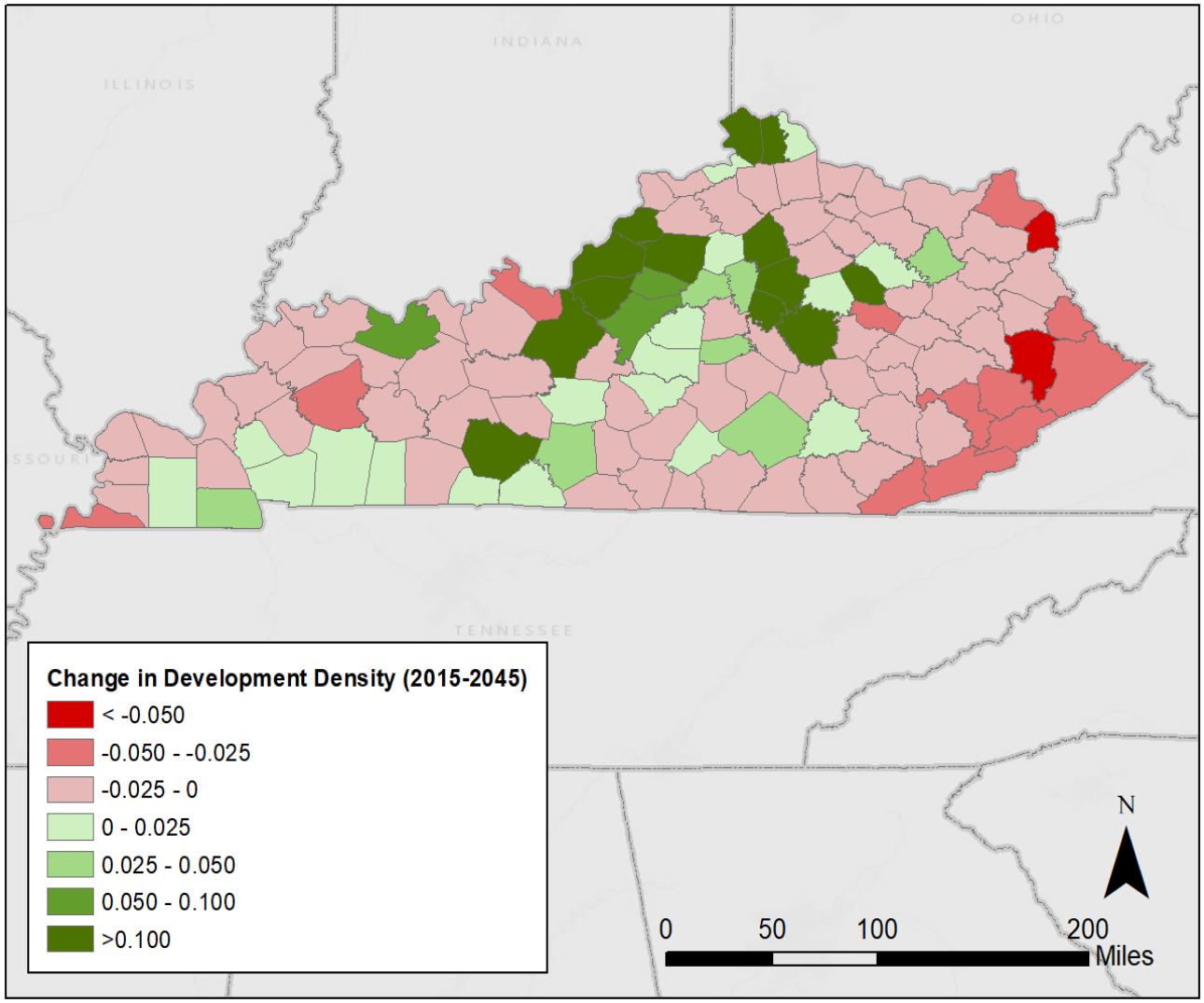
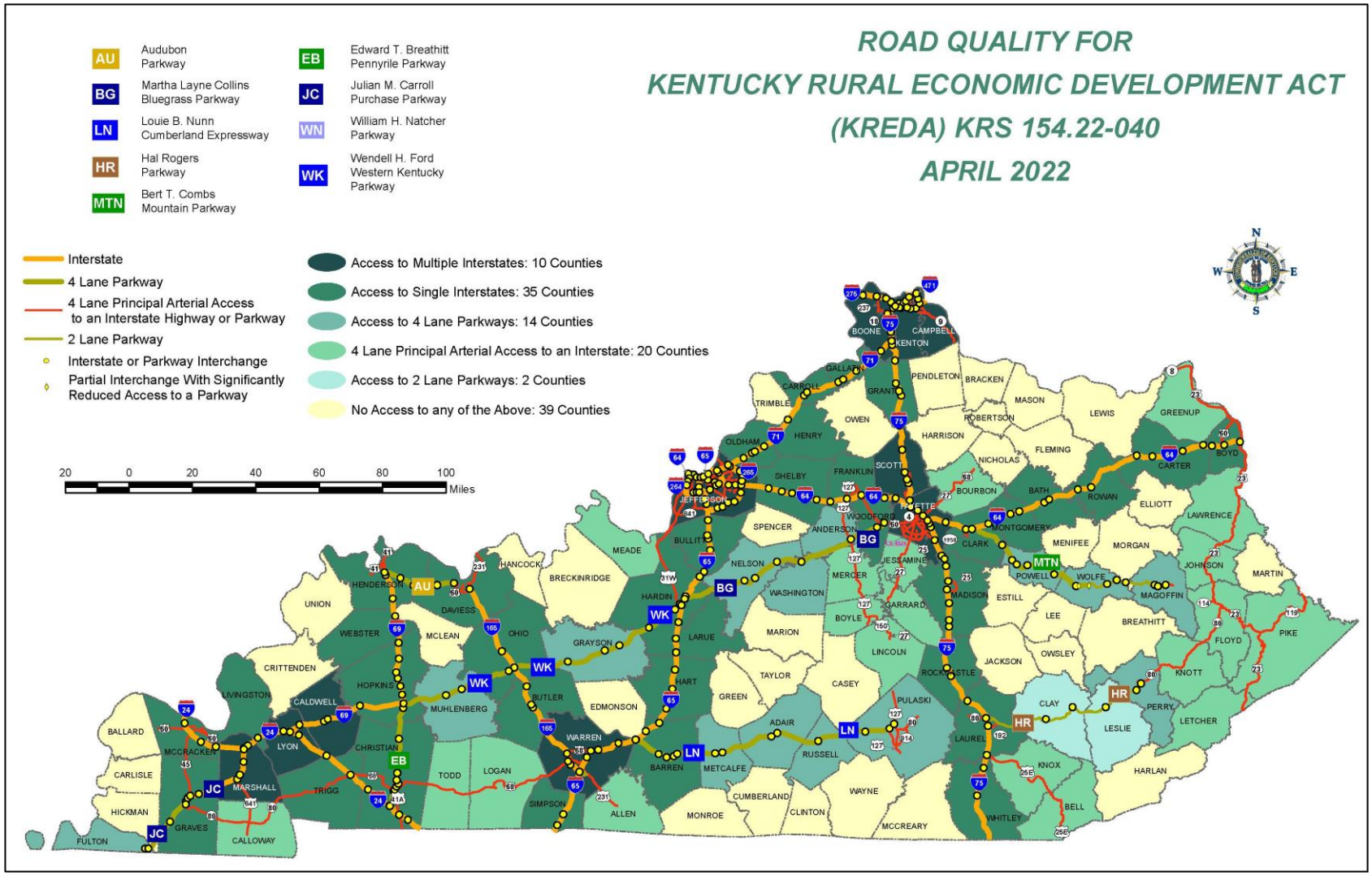


Figure 15: Kentucky Rural Economic Development



PAVEMENT AND BRIDGE CONDITIONS

KYTC maintains 63,845 lane miles of pavement. The pavement network managed by KYTC is worth an estimated $45 billion. The network is essential for the economic wellbeing and safety of Kentucky. Summarized here is the investment and performance for all pavement systems with the exception of the rural secondary system. The rural secondary system consists of 25,655 lane miles of pavement that are managed separately. Much of the rural secondary system is managed by cities and counties and performance data was not available from all local governments.

Investment

KYTC decreased funding levels for all pavements in 2019. In 2019, the Cabinet spent $313 million to provide treatments for roughly 3,053 lane miles of the system. This level of investment requires network pavements to last 12.5 years on average between treatments.

Pavement Sustainability Ratio

A sustained focus on preservation in 2019 resulted in only a slight decrease in the pavement sustainability ratio (PSR) despite a decrease in funding.

In 2019, 64% of the budget was spent on pavement preservation including traditional resurfacing and repair and diamond grinding of Portland Cement Concrete (PCC) pavements, 28% went to rehabilitative treatments, and 7% was used for lower cost preventive maintenance treatments meant to preserve existing conditions. In addition, KYTC spent $355 million on widening, new construction, and safety improvements.

Figure 16: Kentucky Pavement Investment

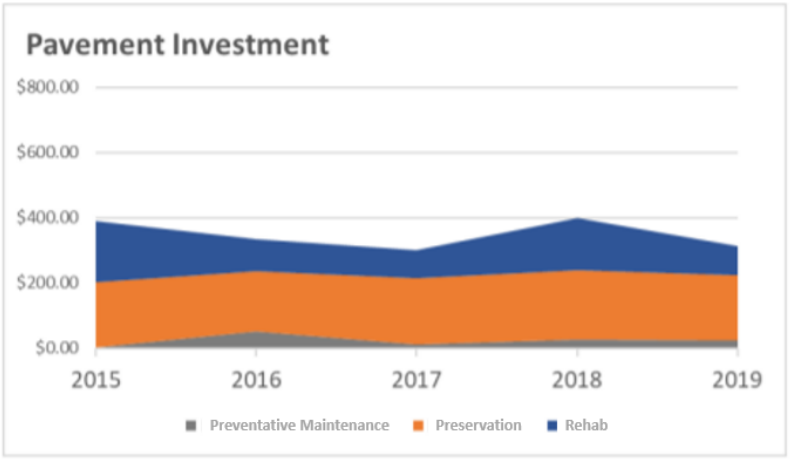
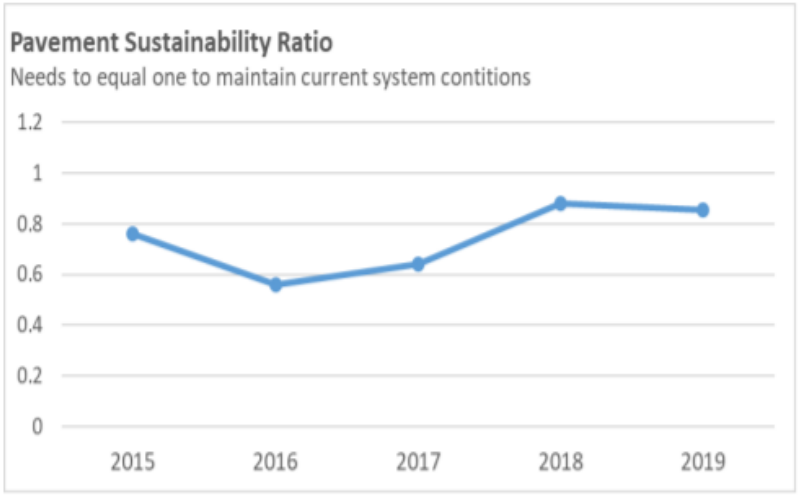


Figure 17: Kentucky Pavement Sustainability Ratio



Pavement Condition

KYTC utilizes a sliding scale that holds high-traffic roadways to a higher standard of performance, rating the roadways as good, fair, or poor depending upon the overall level of distress and the total traffic volume. A good pavement is smooth with few defects while a poor condition pavement is characterized by a rough ride and moderate to severe distresses.

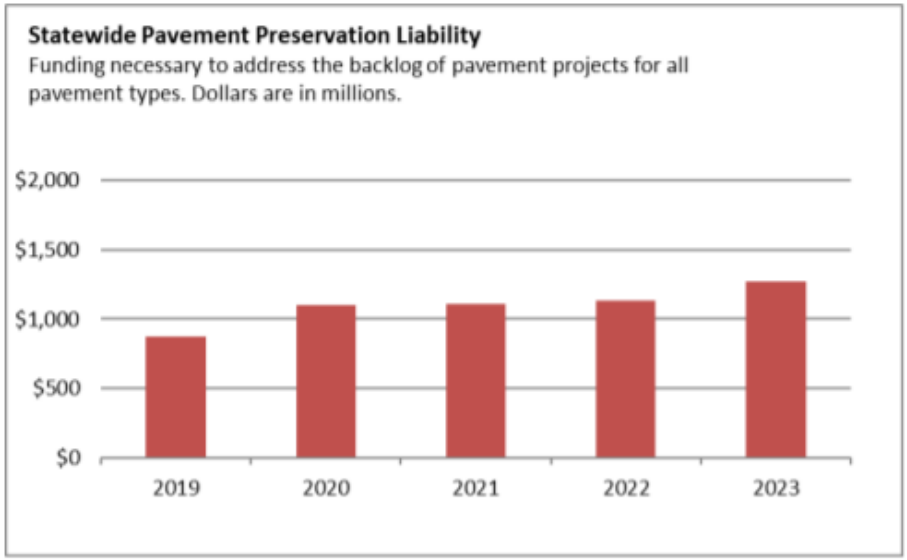
The sustained focus on preservation funding in the past year led to decrease in poor pavement and increase in good pavements. Maintaining this level of funding is required to continue to see pavement network improvements.

Preservation Liability

Preservation liability is an estimate of the accumulated costs to fund the backlog of deferred pavement work. Without increased preservation budget, the pavement liability will increase to $1.25 billion by 2023. Though increased spending in 2019 decreased the current pavement liability from $1 billion to 875 million, projected spending shows a steady increase in pavement liability over the next four years. Continued focus on low-cost preservation treatments will be needed to combat this budget deficit.[14]

Figure 18: Kentucky Statewide Pavement Condition

Figure 19: Kentucky Statewide Pavement Preservation Liability



[14] KYTC 2019 Statewide Pavement Condition Report.
https://transportation.ky.gov/Maintenance/Documents/2019%20STATEWIDE%20PAVEMENT%20CONDITION%20REPORT.pdf

Bridge Conditions

Table 2: Kentucky Bridge Ratings

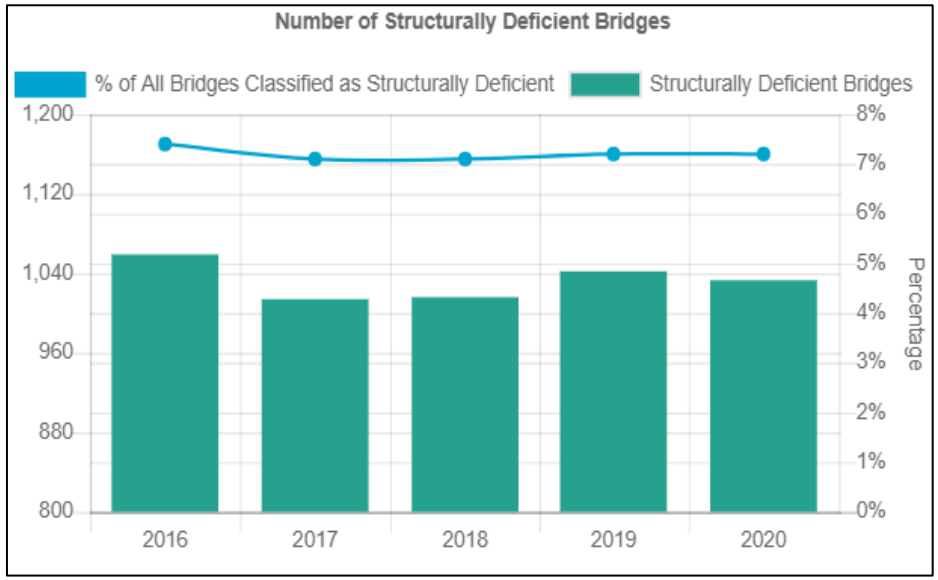
	Number Poor/ Structurally Deficient	Share Poor/ Structurally Deficient	Number Fair	Share Fair	Number Good	Share Good	Total Bridges
Bowling Green	16	5%	204	62%	107	33%	327
Lexington	28	4%	442	61%	219	30%	730
Louisville	124	7%	1,073	63%	495	29%	1,692
Northern Kentucky	42	6%	392	58%	238	35%	673
Owensboro	10	4%	98	35%	174	62%	282
Kentucky Statewide	**1,016**	**7%**	**8,111**	**56%**	**5,239**	**36%**	**14,368**

Seven percent of Kentucky's bridges are rated in poor/structurally deficient condition, meaning there is significant deterioration of the bridge deck, supports or other major components. Fifty-six percent of the state's bridges are rated in fair condition and the remaining 36 percent are in good condition. Most bridges are designed to last 50 years before major overhaul or replacement, although many newer bridges are being designed to last 75 years or longer. In Kentucky, 41 percent of the state's bridges were built in 1969 or earlier. . The tables, figures, and list on this page and the two following provide details for bridge conditions statewide and in the state's largest urban areas as of 2020.[15]

- Of the 14,422 bridges in the state, 1,033, or 7.2 percent, are classified as structurally deficient. This means one of the key elements is in poor or worse condition.
- This is down from 1,059 bridges classified as structurally deficient in 2016.
- The deck area of structurally deficient bridges accounts for 4.9 percent of total deck area on all structures.
- 25 of the structurally deficient bridges are on the Interstate Highway System. A total of 3.6 percent of the structurally deficient bridges are on the National Highway System, which includes the Interstate and other key roads linking major airports, ports, rail, and truck terminals.
- 4,569 bridges are posted for load limits, which may restrict the size and weight of vehicles crossing the structure.
- The state has identified needed repairs on 3,328 bridges at an estimated cost of $2.7 billion.
- This compares to 3,502 bridges that needed work in 2016.[16]

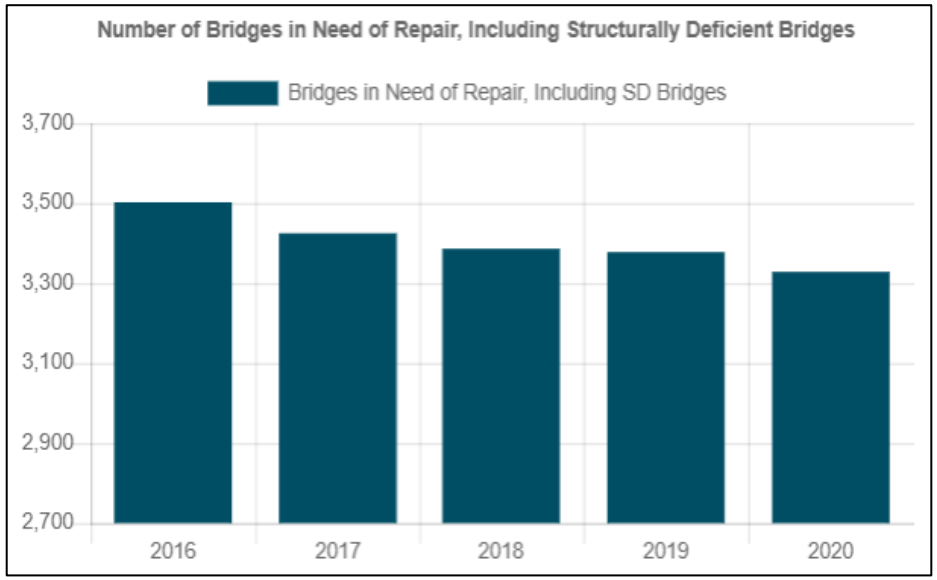
[15] Kentucky Transportation by the Numbers TRIP Report March 2020
[16] *ARTBA Bridge Report*. https://artbabridgereport.org. Accessed 28 June 2022.

Figure 21: Number of Structurally Deficient Bridges



Source: Federal Highway Administration (FHWA) National Bridge Inventory (NBI)

Figure 20: Bridges in Need of Repair



Source: Federal Highway Administration (FHWA) National Bridge Inventory (NBI)

Table 3: Top Most Traveled Structurally Deficient Bridges in Kentucky

County	Year Built	Daily Crossings	Type of Bridge	Location
Jefferson	1959	119,880	Urban Interstate	I-65 over S Brook, E Kentucky St
Jefferson	1957	119,880	Urban Interstate	I-65 over Hill, CSX RR & Burnett
Jefferson	1965	90,900	Urban Interstate	I-64 over CSX,1St,Flyd,Prestn,Rvr
Jefferson	1972	89,929	Urban Interstate	I-64 over 3rd,5th,Rvr Rd,Belvedere
Jefferson	1974	86,651	Urban Interstate	I-264 EB over Ramp(31W NB to 264WB)
Jefferson	1976	72,032	Urban Interstate	I-64 over Old P and L RR (7-13 St)
Jefferson	1984	71,930	Urban Interstate	I-265 over Avoca-Quarry Rd
Jefferson	1970	67,529	Urban Interstate	I-264 over P and L Railway Wye
Jefferson	1969	65,180	Urban Interstate	I-64 Ramp over N Western Pkwy (Ky 3064)

Source: Federal Highway Administration (FHWA) National Bridge Inventory (NBI)

Table 4: Proposed Bridge Work

Type of Work	Number of Bridges	Cost to Repair (in millions)	Daily Crossings
Bridge replacement	627	$675	1,140,916
Widening & rehabilitation	2,041	$1,541	20,318,114
Rehabilitation	533	$241	829,610
Deck rehabilitation/replacement	3	$16	5,712
Other structural work	124	$205	1,050,109
Total	3,328	$2,677	23,344,461

Source: Federal Highway Administration (FHWA) National Bridge Inventory (NBI)

HIGHWAY SAFETY

The Fixing America's Surface Transportation (FAST) Act (2015) continued a trend of increasing emphasis on transportation safety. Notably, it continued the Highway Safety Improvement Program (HSIP) as a core federal-aid program. The HSIP requires that all states have a current Strategic Highway Safety Plan (SHSP) that guides investments of HSIP funds through a data-driven project selection process, as well as a Rail-Highway Crossing Program.

KYTC's approach to safety is guided by its mission, to provide a safe, efficient, environmentally sound, and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky. *Kentucky's 2020-2024 Strategic Highway Safety Plan* (SHSP)[17] that serves as the guiding document to coordinate the highway safety improvement activities of state, federal, and local agencies has the following mission, vision, and goals:

- Mission - To enhance the lives of those who use Kentucky's transportation system by preventing crashes that result in deaths and serious injuries.
- Vision - Through the coordinated and bold efforts of all stakeholders, improve highway safety in Kentucky such that those traveling on roads in the Commonwealth – every person, every trip - arrive at their destination unharmed.
- Goal - Through implementation of this SHSP, prevent serious crashes on Kentucky's highways such that the annual number of deaths falls at or below 500 by the year 2024.

The plan identifies six emphasis areas to guide highway safety improvements. These six are selected for both the urgency of the problem and the opportunity for

Figure 22: Kentucky Highway Safety, Areas of Emphasis

[17] *Kentucky's 2020-2024 Strategic Highway Safety Plan (SHSP),* https:// https://transportation.ky.gov/HighwaySafety/Documents/.

improvements. They are aggressive driving, distracted driving, impaired driving, occupant protection, roadway departure and vulnerable road users.

Kentucky's SHSP is a performance-based plan that is consistent with the safety performance measures established by the United States Department of Transportation (USDOT). These safety performance measures use crash fatality and serious injury data to establish a framework for monitoring progress. The annual safety performance measures represent all public roads and are reported as five-year rolling averages for the measures in Figure 23.

Figure 23: KYTC Annual Targets

Fatalities	The number of persons killed in crashes on all public roads in a calendar year.
Fatality Rate	The number of persons killed in crashes per 100 million vehicle miles traveled (VMT) in a calendar year.
Serious Injuries	The number of persons seriously injured in crashes on all public roads in a calendar year.
Serious Injury Rate	The number of persons seriously injured in crashes per 100 million VMT in a calendar year.
Non-motorized Fatalities & Serious Injuries	The number of pedestrians and bicyclists killed or seriously injured in crashes involving a motor vehicle on all public roads in a calendar year.

KYTC establishes annual targets for each of these five performance measures. Programs and projects across the 4 'E's - Education, EMS, Enforcement, and Engineering - aimed at improving upon these five performance measures in the Highway Safety Plan (HSP) and the HSIP annual report, both of which fall under the umbrella of this overarching Kentucky SHSP. Highway safety in Kentucky has considerably improved over the last 50+ years. The Commonwealth reached a milestone low of 638 crash fatalities in 2013, which was just over half the average total experienced in the early 1970s. The crash fatality rate over this time, calculated as the number of fatalities per one-hundred million VMT, demonstrates even better improvement. The crash fatality rate of 1.36 in 2013 was the lowest ever recorded and over four-and-a-half times lower than the crash fatality rate of 6.18 in 1967.

Figure 24: Kentucky Fatalities

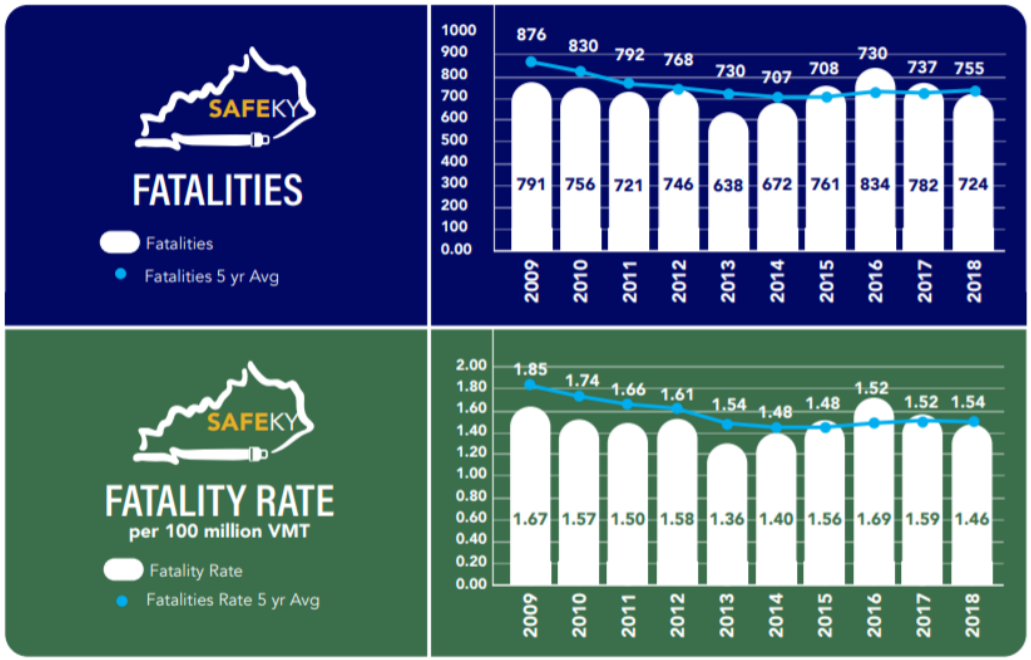
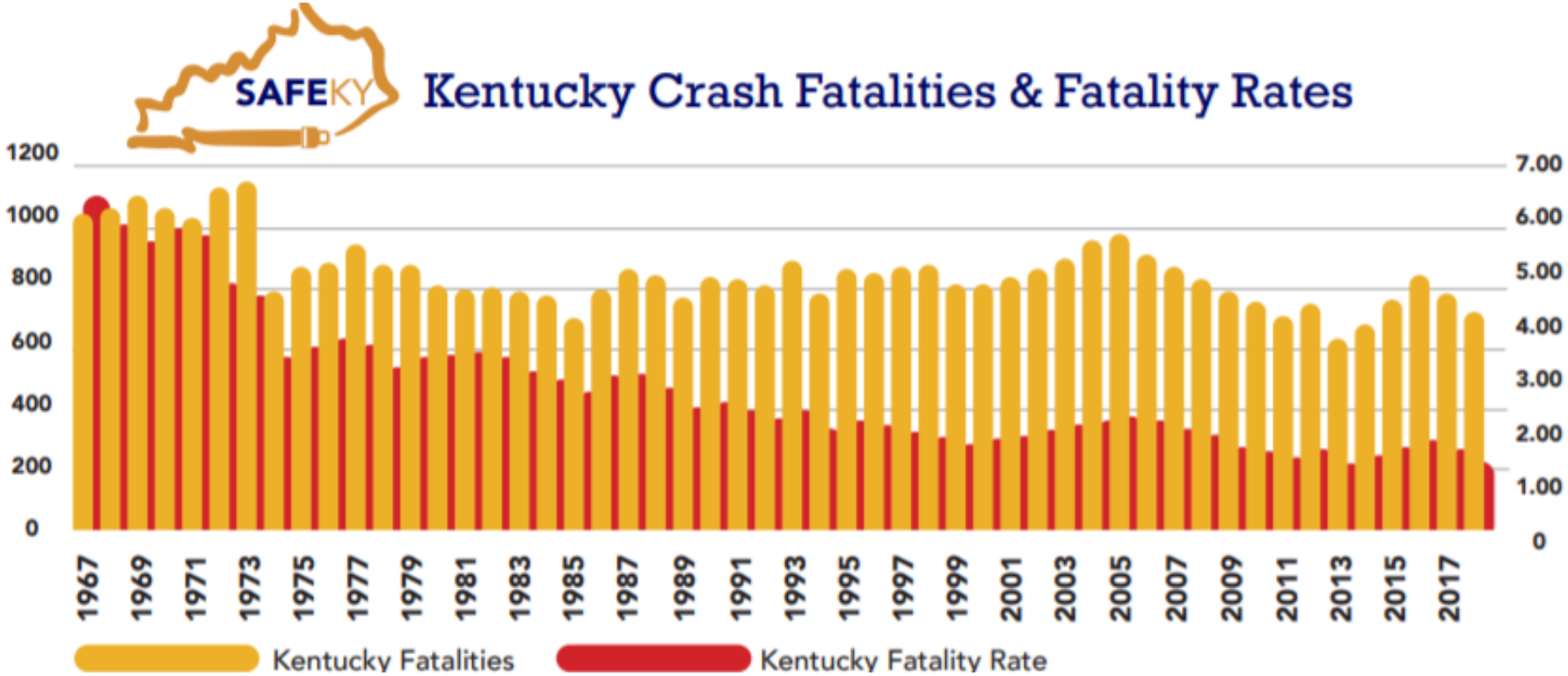


Figure 25: Kentucky Injuries and Fatalities

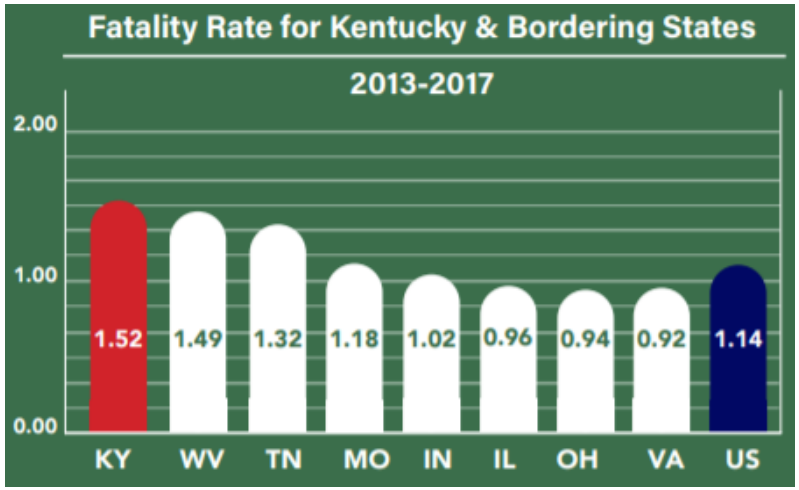
Figure 26: Kentucky Crash Fatalities & Fatality Rates



While 2013 was a milestone year for highway safety, the following years were unable to match this success. In 2016, the state experienced 834 fatalities, which was the highest total in ten years. Crash fatalities and fatality rates began declining again after 2016 but have yet to attain the lower level experienced in 2013. Kentucky's data mirror the recent national trends, which also experienced an all-time low number of fatalities in 2013 before climbing afterward. Another measure of highway safety is the total number of serious injuries resulting from crashes. The annual numbers for serious injuries in Kentucky have shown improvement over the last ten years, falling from 4,491 in 2009 to 2,746 in 2018. The serious injury rate has similarly demonstrated a consistent decline over this time period, falling from 10.77 to 6.21 per 100 million VMT.

The long-term crash fatality trends in Kentucky largely mirror the national trends. From 1967 to 2018, Kentucky's proportion of nationwide fatal crashes averaged 1.98 percent. By and large, over the years as fatality totals rose and fell nationally, they also rose and fell in Kentucky. However, since 2000, Kentucky has not experienced the same levels of reductions that have been seen in the country at large. From 1967 to 1999, Kentucky's average annual share of crash fatalities averaged 1.89 percent of the national totals; however, since 2000, Kentucky's average annual share has risen to 2.13 percent. A similar pattern is also evident in the crash fatality rates. From 1967 to 1999, Kentucky's annual fatality rate was on average 11 percent higher than the national rate; however, since 2000, Kentucky's annual rate has risen to 34 percent higher than the national rate. Additionally, Kentucky's fatality rate was higher than all bordering states. From 2013 to 2017, Kentucky had the 5th highest fatality rate among the 50 states in the U.S.

Figure 27: Fatality Rate for Kentucky and Bordering States 2013-2017



HSIP Safety Challenges and Opportunities

Successful implementation of this SHSP will result in actions that save lives and prevent serious injuries. To achieve this, a comprehensive statewide highway safety program is necessary to guide implementation of safety strategies on Kentucky's highways. In Kentucky, this program is administered by the Governor's Executive Committee on Highway Safety (GECHS), the Kentucky Office of Highway Safety (KOHS), and emphasis area task forces. Each of these are unified in their commitment to:

Leadership: Bold, ambitious, and innovative leadership is essential to achieving the goals set forth in this plan. Leaders are responsible for influencing policy direction, setting priorities, and defining performance expectations for those responsible for its implementation.

Communication: Developing and delivering a consistent and impactful message is an effective way to spread awareness and promote ownership of a transportation-safety culture.

Collaboration: Establishing a broad-based SHSP coalition promotes shared responsibility among agencies and individuals.

It also leverages resources and enables combinations of strategies and countermeasures that more effectively and efficiently improve safety. Finally, it broadens the areas of expertise involved in highway safety. Each of the 4Es provide necessary knowledge and can offer meaningful approaches. All working together can break down a "siloed" mindset to produce a coordinated, comprehensive approach to safety.

HSIP is a core federal-aid program with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads. Under the requirements of the FAST Act, states are required to administer the HSIP with a data-driven, strategic, and performance-focused approach to improving highway safety, primarily through the implementation of infrastructure-related highway safety improvements. Kentucky's HSIP funding is approximately $41 million annually, and the program is administered by KYTC's Division of Traffic Operations. As one of the primary mechanisms for addressing the engineering side of highway safety, the focus of Kentucky's HSIP is on the users of our highway network. By seeking to eliminate and reduce severe outcomes along our state's highways, the HSIP not only supports the SHSP by improving highway safety, but also KYTC's mission by enhancing the quality of life in Kentucky. Traditionally, HSIP has focused on the implementation of highway projects with engineering countermeasures that are consistent with Kentucky's SHSP and that improve a hazardous road location and/or address a highway safety issue. When it comes to project selection, HSIP staff utilize a data-driven approach incorporating Highway Safety Manual methodologies to identify improvements and prioritize investments on highway sections with the greatest potential for a reduction in crash numbers and crash severity. More recently, HSIP staff has expanded their efforts beyond project lettings to include the propagation of highway safety culture and in all phases of project development and delivery across the Commonwealth.[18]

Transportation Systems Management and Operations (TSMO)

KYTC is also currently implementing TSMO through a coordinated effort across a variety of departments and is currently developing a TSMO Plan. The purpose of a TSMO plan is to improve the capabilities and coordination of KYTC to proactively manage Kentucky's multimodal transportation system. TSMO refers to operational improvements to the highway system that can improve safety and restore performance before extra capacity is needed. TSMO includes safety and intelligent transportation systems (ITS).

PROJECT LIFE CYCLE

KYTC's project development and delivery moves in a continuous life cycle linking the four main areas of transportation system development and maintenance – planning, design, construction, and operations. This cycle is shown in Figure 28. Figure 29 depicts KYTC's knowledge-driven process for effective decision-making to address maintenance and improvement projects. Figure 30 is a graphic image that KYTC uses to help the public understand the development and delivery process used for projects.[19]

[18] *Kentucky's 2020-2024 Strategic Highway Safety Plan (SHSP),* https:// https://transportation.ky.gov/HighwaySafety/Documents/.
[19] https://transportation.ky.gov/Planning/Documents/2020%20Final%20PIP%20Update%20with%20Appendix%20A%20and%20B.pdf

Figure 28: KYTC Transportation Project Life Cycle

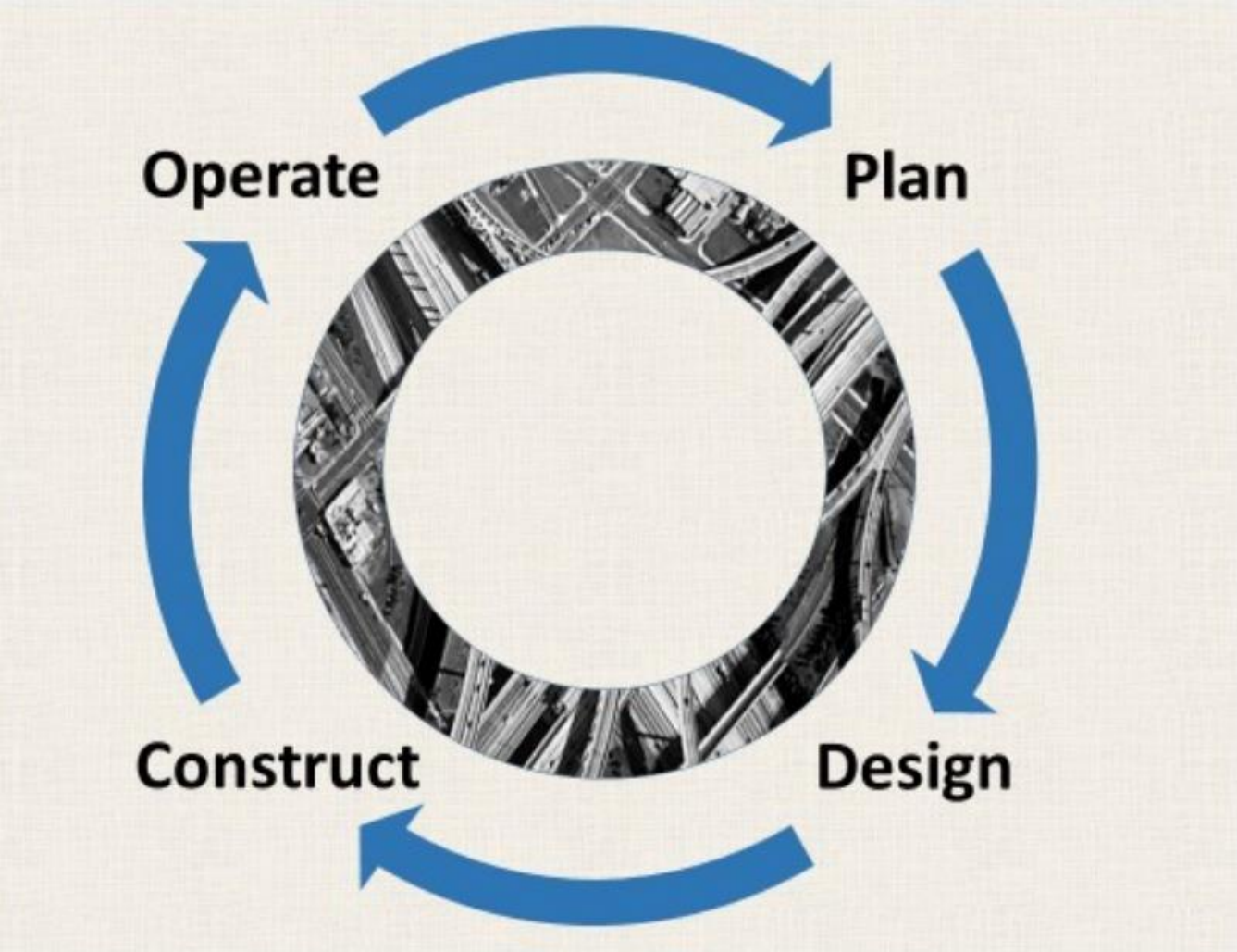


Figure 29: Public Involvement with STIP, LRSTP and Consultation Process

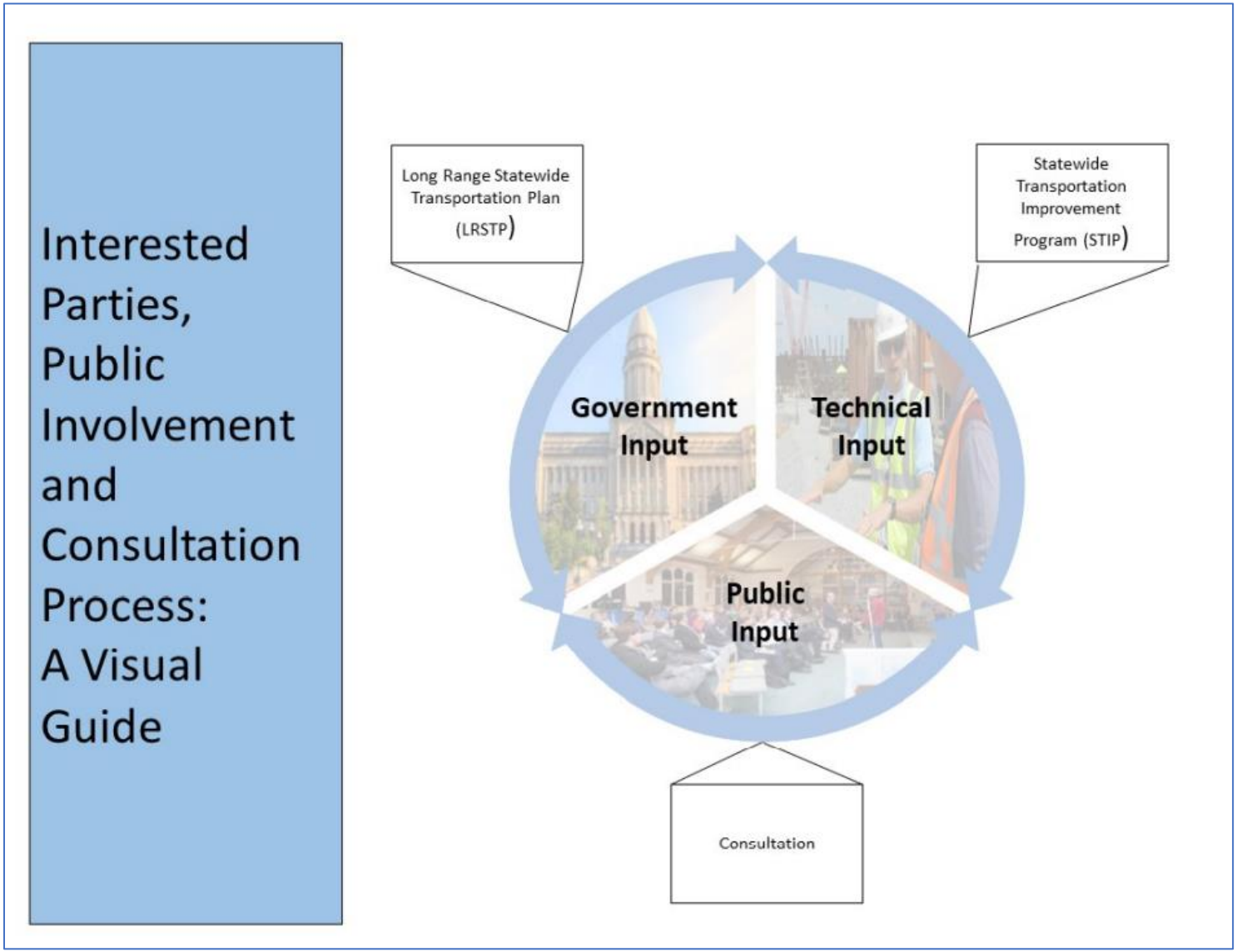


Figure 30: KYTC Project Development and Delivery Process